Draft Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Annexes II to V to Commission Regulation (EU) No 965/2012

(RMT.0325 (OPS.057(a)) & RMT.0326 (OPS.057(b)))

The AMC and GM to Annexes II to V to Commission Regulation (EU) No 965/2012 are amended as follows:

The text of the amendment is arranged as follows to show deleted, new, or unchanged text:

(a) deleted text is ~~struck through~~;

(b) new text is highlighted in blue;

(c) an ellipsis '[…]' indicates that the rest of the text is unchanged.

Note: AMC1 SPA.HEMS.145(b) HEMS operating base facilities is planned to apply 3 years after the publication of the ED Decision.

1. Draft AMC & GM to Annex II (Part-ARO) to Commission Regulation (EU) No 965/2012

1. AMC2 ARO.OPS.215 is amended as follows:

AMC2 ARO.OPS.215 Approval of helicopter operations over a hostile environment located outside a congested area

ENDORSEMENT BY ANOTHER STATE

(a) Whenever the operator applies for an endorsement to operate over hostile environment located outside a congested area in another State in accordance with CAT.POL.H.420, the competent authority of that other State should only grant the endorsement once it is satisfied that:

(1) the safety risk assessment is appropriate to the area overflown, considering which of the following operations are relevant to the application:

(i) HEMS operations, in accordance with SPA.HEMS.125(a)(2);

(ii) HEMS operations, in accordance with SPA.HEMS.125(a)(3);

(iii) CAT operations, other than the above; and

(2) the operator's substantiation that preclude the use of the appropriate performance criteria are appropriate for the area overflown.

(b) The competent authority of that other State should inform the competent authority of the Member State responsible for issuing the approval.

2. The following GM1 ARO.OPS.215 is inserted:

GM1 ARO.OPS.215 Approval of helicopter operations over a hostile environment located outside a congested area

DESIGNATED AREAS

The authority may, based on its own assessment or on the substantiation of operators, designate different areas for the following operations:

(a) HEMS operations, in accordance with SPA.HEMS.125(a)(2);

(b) HEMS operations, in accordance with SPA.HEMS.125(a)(3);

(c) CAT operations, other than the above.

3. AMC2 ARO.OPS.220 is amended as follows:

AMC2 ARO.OPS.220 Approval of helicopter operations to or from a public interest site

ENDORSEMENT BY ANOTHER STATE

(a) Whenever the operator applies for an endorsement to operate to/from a public interest site in another State in accordance with CAT.POL.H.225, the competent authority of that other State should only grant the endorsement once it is satisfied that:

(1) the conditions of CAT.POL.H.225(a)(1) through (5) can be met by the operator at those sites for which endorsement is requested; and

(2) the operations manual includes the procedures to comply with CAT.POL.H.225(b) for these sites for which endorsement is requested.

(b) The competent authority of that other State should inform the competent authority of the Member State responsible for issuing the approval.

(c) The competent authority of that other State should notify the competent authority of the Member State responsible for issuing the approval whenever the obstacle environment is known to have changed.

4. The following AMC3 ARO.OPS.220 is inserted:

AMC3 ARO.OPS.220 Approval of helicopter operations to or from a public interest site

DIRECTORY OF PUBLIC INTEREST SITES

Each competent authority should maintain a directory of all public interest sites that are subject to an approval or an endorsement in its territory.

Each competent authority should either publish or provide the following element to operators and other competent authorities on their request, if available: The point of contact of a person responsible at the public interest site.

5. The following GM1 ARO.OPS.220 is inserted:

GM1 ARO.OPS.220 Approval of helicopter operations to or from a public interest site

(a) A permanent obstacle is a natural or artificial obstacle which is expected to remain for one year or more. Constructions that are expected to be removed within one year are non-permanent, termporary obstacles.

(b) In the case of temporary changes to the obstacle environment, the competent authority may take the appropriate temporary measures.

(c) In the case of changes to the obstacle environment at a site located on the territory of another State, the competent authority of the operator may liaise with the competent authority of that State.

6. The current GM4 ARO.OPS.200 is deleted:

~~GM4 ARO.OPS.200 Specific approval procedure~~

~~HELICOPTER POINT-IN-SPACE (PINS) APPROACHES AND DEPARTURES WITH REDUCED VFR MINIMA~~

~~When issuing an approval for helicopter PinS approaches and departures with reduced VFR minima, the competent authority may use the 'OTHERS' box of Appendix II (EASA Form 139).~~

2. Draft AMC & GM to Annex III (Part-ORO) to Commission Regulation (EU) No 965/2012

7. GM1 ORO.GEN.130(b) is amended as follows:

GM1 ORO.GEN.130(b) Changes related to an AOC holder

CHANGES REQUIRING PRIOR APPROVAL

The following GM is a non-exhaustive checklist of items that require prior approval from the competent authority as specified in the applicable ~~I~~implementing ~~R~~rules:

[…]

(j) helicopter operations:

(1) over a hostile environment located outside a congested area~~, unless the operator holds an approval to operate according to Subpart J of Annex V (SPA.HEMS)~~;

(2) to/from a public interest site located in a congested hostile environment where performance class 1 criteria cannot be met;

(3) under performance class 2 or 3 without an assured safe forced landing capability;

(4) that include short excursions above 13 000 ft without using supplemental oxygen within a HEMS mission.

8. GM1 ORO.TC.105 is amended and changed to AMC as follows:

AMC1 ~~GM1~~ ORO.TC.105 Conditions for assignment to duties

GENERAL

[…]

(d) Technical crew members should:

(1) be in good health;

(2) be free from any physical or mental illness that might lead to incapacitation or inability to perform crew duties;

(3) have normal cardiorespiratory function;

(4) have normal central nervous system;

(5) have adequate visual acuity 6/9 with or without glasses;

(6) have adequate hearing; ~~and~~

(7) have normal function of ear, nose and throat~~.~~; and

(8) be colour safe for night operations.

(e) Validity of medical assessments and reassessments

(1) The medical assessment or reassessment of points (d)(1) to (d)(4) and (d)(6) and (d)(7) should have a validity of a period of:

(i) 60 months, until the technical crew member reaches the age of 40;

(ii) 24 months, for technical crew members aged above 40.

(2) The medical assessment or reassessment of point (d)(5) should have a validity of a period of:

(i) the duration defined in (e)(1)(i) and (e)(1)(ii), until the technical crew member reaches the age of 50;

(ii) 12 months, for technical crew members aged above 50.

(3) Point (d)(8) should be assessed but needs not be re-assessed.

(f) A class 2 medical certificate issued in accordance with Commission Regulation (EU) No 1178/2011[1] meets these requirements.

(g) A LAPL medical certificate issued in accordance with Commission Regulation (EU) No 1178/2011, complemented with timely medical reassessments of point (d)(5), meets these requirements.

9. The following AMC2 ORO.TC.110 is inserted:

AMC2 ORO.TC.110 Training and checking

RECURRENT CHECKING

Validity period of recurrent checking.

(a) The validity period should be counted from the end of the month when the checking was taken.

(b) When the check is completed within the last 3 months of the validity period, the new validity period should be counted from the original expiry date.

10. AMC1 ORO.TC.115 is amended as follows:

AMC1 ORO.TC.115 Initial training

[Regulatory source]

ELEMENTS

(a) The elements of initial training mentioned in ORO.TC.115 should include in particular:

[…]

(7) Effective communication between technical crew members and flight crew members, including common language and terminology.

(8) All elements of CRM training applicable to flight crews operating in a multi-pilot environment, as described in AMC1 ORO.FC.115, with the following difference: CRM

[1] OJ L 311, 25.11.2011, p. 1.

principles should be integrated into relevant parts of technical crew training and operations including checklists, briefings, abnormal and emergency procedures.

11. AMC1 ORO.TC.135 is amended as follows:

AMC1 ORO.TC.135 Recurrent training

[Regulatory source]

ELEMENTS

(a) The 12-month period mentioned in ORO.TC.135(a) should be counted from the last day of the month when the first checking was made. Further training ~~and checking~~ should be undertaken within the last 3 calendar months of that period. The new 12-month period should be counted from the original expiry date.

(b) The recurrent practical training should include every year:

(1) emergency procedures, including early identification of pilot incapacitation;

(2) evacuation procedures;

(3) touch-drills by each technical crew member for opening normal and emergency exits for (passenger) evacuation;

(4) the location and handling of emergency equipment and the donning by each technical crew member of life jackets and protective breathing equipment (PBE), when applicable;

(5) first aid and the contents of the first-aid kit(s);

(6) stowage of articles in the cabin;

(7) use of dangerous goods, if applicable;

(8) incident and accident review; and

(9) crew resource management: all ~~major~~ topics of the initial CRM training should be covered over a period not exceeding 3 years.

[…]

3. Draft AMC & GM to Annex IV (Part-CAT) to Commission Regulation (EU) No 965/2012

12. The following AMC1 CAT.POL.H.215(a)(1); (a)(2) is inserted:

AMC1 CAT.POL.H.215(a)(1); (a)(2)

RELEVANT TERRAIN AND OBSTACLES IN IFR

All terrain and obstacles along the route within the following distance on either side of the intended track should be considered:

(a) 9.3 km (5 NM) to be increased to 10 NM if the navigational accuracy cannot be met for 95 % of the total flight time; or

(b) when flying in accordance with PBN procedures, a distance equal to or greater than the required navigation performance.

13. The following GM1 CAT.POL.H.215(a)(3) is inserted:

GM1 CAT.POL.H.215(a)(3)

RELEVANT TERRAIN AND OBSTACLES IN VFR

The terrain and obstacles to be considered are within the distance on either side of the intended track that is specified in the applicable airspace requirements:

(a) for day VFR, the distances are specified in SERA.5005(f);

(b) for night VFR, the distances are specified in SERA.5005(c), or as authorised by the competent authority;

14. The following AMC1 CAT.POL.H.225 is inserted:

AMC1 CAT.POL.H.225 Helicopter operations to/from a public interest site

CHANGES TO THE OBSTACLE ENVIRONMENT

If the operator becomes aware of a change to the obstacle environment at an approved public interest site, the operator should:

(a) assess the safety impact of such new obstacles on their operations;

(b) review their site-specific procedures and modify them as necessary;

(c) Discontinue operations at the site if necessary;

(d) Inform the competent authority of all of the above.

15. GM1 CAT.POL.H.225 is amended as follows:

GM1 CAT.POL.H.225 Helicopter operations to/from a public interest site

UNDERLYING PRINCIPLES

(a) General

[…]

(d) Long-term solution

~~Although not offering a complete solution, it was felt that a significant increase in safety could be achieved by applying an additional performance margin to such operations. This solution allowed the time restriction of 2004 to be removed.~~

(1) The derogation provided for by Article 6.6 of Regulation (EU) No 965/2012, which allows Member States to approve public interest sites under their own conditions, was meant to be a temporary transitional arrangement. This transitional arrangement was only intended to allow the continuation of existing sites. For this reason, any newly approved public interest sites that have been established since 28 October 2014 will have to be phased out by [5 years after publication of the implementing rule].

(2) No mandatory phase-out is foreseen for sites approved under a derogation from CAT.POL.H.225that were established as public interest sites before 28 October 2014.

(3) No mandatory phase-out is foreseen for sites approved under CAT.POL.H.225 that were established as public interest sites before 1 July 2002.

(4) A public interest site should be considered to be established at the time when it was operated in the public interest for the first time.

(5) As of the 'date of entry into force of this amendment' there should be no more approvals of public interest sites that were established after 28 October 2014, in accordance with point ARO.OPS.220(c).

(6) As of the 'date of entry into force of the amendment to the implementing rule' the obstacle environment at approved public interest sites should be kept under continued review in order to avoid new obstacles causing a significant safety impact, in accordance with point ARO.OPS.220(d).

Table 1. Duration of public interest site approvals

Date on which the approved PIS was established	**Maximum duration of the PIS approval**
Before 28.10.2014	Unlimited duration, provided there is no permanent

	worsening of the obstacle environment.
After 28.10.2014	PIS approval to expire [5 years after publication of the implementing rule].

(7) Since a number of hospital sites may remain approved public interest sites in the foreseeable future, it was considered important to keep minimum performance margins when operating these sites.

(i) The ~~required~~ performance level of 8 % climb gradient in the first segment required by point CAT.POL.H.225(a)(5) reflects ICAO Annex 14 Volume II in 'Table 4-~~3~~1 'Dimensions and slopes of obstacle limitations surfaces' ~~for performance class 2~~.

It was established as a means of mitigating performance issues. It defines a proportionate mass penalty at such sites, thereby applying an additional performance margin to such operations in the interest of safety.

(ii) The performance delta is achieved without the provision of further manufacturer's data by using existing graphs to provide the reduced take-off mass (RTOM).

(iii) If the solution in relation to the original problem is examined, the effects can be seen.

(A~~1~~) Solution with relation to (c)(1): although the problem still exists, the safest procedure is a dynamic take-off reducing the time taken to achieve Vstayup and thus allowing VFR recovery — if the failure occurs at or after Vy and 200 ft, an IFR recovery is possible.

(B~~2~~) Solution with relation to (c)(2): as in (c)(1) above.

(C~~3~~) Solution with relation to (c)(3): once again, this does not give a complete solution~~;~~ however, the performance delta minimises the time during which a climb over the obstacle cannot be achieved.

16. The following AMC2 CAT.IDE.H.240 is inserted:

AMC2 CAT.IDE.H.240 Supplemental oxygen — non-pressurised helicopters

OXYGEN STORAGE AND DISPENSING EQUIPMENT

(a) Supplemental oxygen requirements may be met either by means of installed or portable equipment.

(b) The use of oxygen dispensers should not prevent the crew from performing their intended tasks, including any radio communications.

(c) The oxygen-dispensing unit may consist of a nasal oxygen cannula.

4. Draft AMC & GM to Annex V (Part-SPA) to Commission Regulation (EU) No 965/2012

17. The following AMC1 SPA.NVIS.110(e) is inserted:

AMC1 SPA.NVIS.110(e) Equipment requirements for NVIS operations

DEMONSTRATION OF EQUIVALENT VISUAL ACUITY

(a) The operator should ensure that one of the following conditions are met.

(1) all required NVG should be of the same make and model; or

(2) the operator should ensure that:

(i) the different NVG meet the same set of specifications (eg generation); and

(ii) the lowest figure of merit of the different models is no less than 85 % of the higher figure of merit; or

(3) the operator analyses the available specification of the NVG that are considered for compatibility. It conducts an operational demonstration to assess the differences in visual acuity of the different models of NVG that are considered for compatibility. It conducts a risk assessment to determine whether the different models can be used by different crew members on the same flight and under which conditions.

(b) Analysis of the available specifications: If, based on the specifications that are available, the different models of NVG appear to be of different generations, they should only be used together on the same flight on a temporary basis, as part of an operator upgrade to a better generation of NVG.

(c) Operational demonstration :

(1) Environmental conditions. The operational demonstration should take place in all of the following conditions :

(i) Full moon and moisture < 70% relative humidity

(ii) At least one lighting condition that is in-between

(iii) No moon (eg .5 mlux)

(2) Relevant terrain and lights.

(i) The operational demonstration should compare the visual acuity offered by the different NVG for a representative set of terrain under all environmental conditions specified above.

(ii) The operational demonstration should compare the visual acuity offered by the different NVG for a representative set of lights under all environmental conditions specified above.

(3) Operational environment:

(i) The operational demonstration may take place on dedicated non-commercial flights, or during commercial operations if the following conditions are met:

(A) On any given flight, all crew members use NVG of the same make and model

(B) Different models of NVG are used on different flights within the same mission

(C) The lighting conditions remain the same within the same mission.

(ii) A FSTD should not be used for the operational demonstration

(4) The operator should define the operational demonstration methodology in the operations manual, and should provide an 'operational demonstration sheet' to crew members in charge of the assessment, which includes all defined elements to be assessed under all defined light conditions.

(5) Crew members in charge of the assessment should have logged at least 100 NVIS flights or 30 hours' flight time under NVIS as pilot-in-command/commander.

(d) Risk assessment:

(1) The operator should consider the results of the analysis of the available specifications and the results of the operational demonstration in its risk assessment. The conclusion may be as follows :

(i) the different models of NVG should not be used together on the same flight;

(ii) the different models of NVG may be used on the same flight with no restrictions; or

(iii) the different models of NVG may be used on the same flight with one or more of the following restrictions:

(A) The pilot flying uses the best NVG available;

(B) On dark nights, a briefing is made on the differences. Dark nights could be either as less than 1mLux OR or be defined by the operator based on the assessment results;

(C) Any additional restrictions as defined by the operator.

(2) The risk assessment should consider the interchangeability of the NVG available on board, including any NVG of different makes and models, as well as spare NVG.

(3) The risk assessment may consider the benefits of upgrading the NVG to a better standard.

(i) The duration of the transition to a new NVG should be taken into account at operator level.

(ii) If the operator has more than one operating base, it may be possible to equip a given operating base with NVG of the same model, whereas another operating base will have different NVG. In such case the operator should determine the conditions under which the crew changes from one operating base to another.

(iii) If the operator defines that a crew usually uses the same upgraded model of NVG except when one of these is in maintenance in which case a previous model is used, the operator may need to define additional restrictions and conditions for the use of the previous model. Such conditions may include a familiarisation on ground during the night or training flight before the spare model is planned to be used in flight.

(e) SOPs. The operator should comply with any restrictions established in its risk assessment.

DEMONSTRATION THAT DIFFERENT NVG ARE OF THE SAME FILTER CLASS

(f) The operator should demonstrate that NVG of different models have the same filter class, in order to ensure that they will not filter out different external lights. This might be possible despite both NVG models being compatible with the helicopter as determined in the flight manual.

18. The following GM1 SPA.NVIS.110(e) is inserted:

GM1 SPA.NVIS.110(e) Equipment requirements for NVIS operations

SET OF SPECIFICATIONS AND GENERATIONS

(a) Generations may be defined as per US military specifications or as below.

(1) Generation 0 typically uses a S-1 photocathode with peak response in the blue-green region (with a photosensitivity of 60 micro A /lm), electrostatic inversion, and electron acceleration to achieve gain. Consequently generation 0 tubes are characterised by the presence of geometric distortion and the need for active infrared illumination.

(2) Generation 1 typically uses a S-20 photocathode (with a photosensitivity of 180-200 micro A /lm), electrostatic inversion, and electron acceleration to achieve gain. Because of higher photo-sensitivity, generation 1 was the first truly passive image intensifier. Generation 1 is characterised by the presence of geometric distortion, low performance at low light level and blooming.

(3) Generation 2 typically uses a S-25 photocathode (extended red, with a photosensitivity of 240 micro A /lm or more), and a microchannel to achieve gain. Generation 2 tubes provide satisfactory performance at low light levels and low distortion.

(4) Generation 3 uses gallium-arsenide for the photocathode (photosensitivity of 800+ micro A /lm in the near infrared) and a micro-channel plate for gain. The microchannel is coated with an ion barrier film to increase tube life. Generation 3 has very good to excellent performance at low light level. Recent models have no perceptible distortion.

(b) NVG of ‘generation 3 autogated’ or ‘generation 3+’ as defined by the US military are sometimes called ‘generation 4’ commercially. The differences with generation 3 are limited to the following and are therefore considered not to be signifinant. Generations 3 to 4 as mentioned above may be considered to be the same generation.

(1) they are autogated, therefore more robust to high illumination and abrupt changes of the illumination level

(2) they are unfilmed, which gives less image noise

(c) Non-civilian set of specifications – other than generations - that ensures sufficient equivalent visual acuity may also be used. OMNI specifications from the US military may be used.

(d) The figure of merit is resolution * signal to noise ratio.

19. GM1 SPA.HEMS.100(a) is amended as follows:

GM1 SPA.HEMS.100(a) Helicopter emergency medical service (HEMS) operations

THE HEMS PHILOSOPHY

(a) Introduction

This GM outlines the HEMS philosophy. Starting with a description of acceptable risk and introducing a taxonomy used in other industries, it describes how risk has been addressed in this Subpart to provide a system of safety to the appropriate standard. It discusses the difference between HEMS and air ambulance -— in regulatory terms. It also discusses the application of operations to public interest sites in the HEMS context.

Following the extension of the definition of HEMS to rescue operations other than search and rescue (SAR), this GM also discusses rescue operations.

Natural disasters can overwhelm a well dimensioned HEMS services at either local or national level. It is up to the State to define how State aircraft or civilian aircraft operated under national rules may complement HEMS services in such [extreme] cases. Operations that take place under national regulations are not discussed in this Regulation.

(b) Acceptable risk

The broad aim of any aviation legislation is to permit the widest spectrum of operations with the minimum risk. In fact, it may be worth considering who/what is at risk and who/what is being protected. In this view, three groups are being protected:

(1) third parties (including property) — highest protection;

(2) passengers (including patients); and

(3) crew members (including technical crew members) — lowest protection.

It is for the ~~L~~legislator to facilitate a method for the assessment of risk — or as it is more commonly known, safety management (refer to Part-ORO).

(c) Risk management

Safety management textbooks[2] describe four different approaches to the management of risk. All but the first have been used in the production of this section and, if it is considered that the engine failure accountability of performance class 1 equates to zero risk, then all four are used (this of course is not strictly true as there are a number of helicopter parts, -such as the tail rotor which, due to a lack of redundancy, cannot satisfy the criteria):

(1) Applying the taxonomy to HEMS gives:

(i) zero risk; no risk of accident with a harmful consequence -— performance class 1 (within the qualification stated above) -— the HEMS operating base;

(ii) de minimis; minimised to an acceptable safety target -— for example, the exposure time concept where the target is less than 5 ×~~x~~ 10^{-8} (in the case of elevated final approach and take-off areas (elevated FATOs) at hospitals in a

[2] Reason, J. (1997). *Managing the Risks of Organizational Accidents*. Farnham: Ashgate.

congested hostile environment the risk is contained to the deck edge strike case -— and so in effect minimised to an exposure of seconds);

(iii) comparative risk; comparison to other exposure -— the carriage of a patient with a spinal injury in an ambulance that is subject to ground effect compared to the risk of a HEMS flight (consequential and comparative risk);

(iv) as low as reasonably practicable; where additional controls are not economically or reasonably practicable -— operations at the HEMS operating site (the accident site).

(2) 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. In simple terms, there are three areas in HEMS operations where risk, beyond that allowed in Part-CAT and Part-ORO, are identified and related risks accepted:

(i) in the en-route phase, where alleviation is given from height and visibility rules;

(ii) at the accident site, where alleviation is given from the performance and size requirement; and

(iii) at an elevated hospital site in a congested hostile environment, where alleviation is given from the deck edge strike -— provided~~ing~~ elements of the CAT.POL.H.305 are satisfied.

In mitigation against these additional and considered risks, experience levels are set, specialist training is required (such as instrument training to compensate for the increased risk of inadvertent entry into cloud), and operation with two crew (two pilots, or one pilot and a HEMS technical crew member) is mandated.
(HEMS crews and medical passengers are also expected to operate in accordance with good crew resource management (CRM) principles.)

(d) Additional mountain-specific considerations including high altitudes and rescue operations other than search and rescue (SAR)

It was considered necessary to enable sling load operations under HEMS, in addition to the hoist. Environmental, equipment or organisational conditions may lead operators to choose either the external hoist or cargo hook operation, based on a risk assessment.

In order to enable HEMS operations at all altitudes, HEMS operations under performance class 3 have been authorised under the following conditions: operations over a hostile environment should only be conducted when a HEMS operating site used for take-off, landing or HEMS HEC operations is located above 7 000 ft altitude

The use of category A or equivalent helicopters improves safety during the entire mission, not only in respect of risk of engine failure, but also because of the available system redundancies. Operation in performance class 3 with helicopters not certified as category A or equivalent remains possible under a defined set of conditions and risk mitigations.

(~~d~~e) Air ambulance

In regulatory terms, air ambulance is considered to be a normal transport task where the risk is no higher than for commercial air transport operations under Part-CAT and ~~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 to 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 a 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 prerequisite 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 am bulance 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 Air Operator Certificate (AOC) (HEMS operators hold an AOC) — and usually are conducted when the carriage of medical supplies (equipment, blood, organs, drugs, etc.) is undertaken and when urgency is not an issue.

Regarding other than SAR rescue operations, if a person is endangered by the environment without a medical condition, then a helicopter may be needed. Such danger may arise, for instance, from temperature, wind, or snow. The same principles should apply when the person's life is not immediately endangered by the situation, however action is required, the flight is considered to be a normal transport task where the risk is not higher than for commercial air transport operations under Part-CAT and Part-ORO. None of the additional requirements of HEMS need to be applied. Such a rescue operation may also be conducted by a HEMS operator.

When the medical condition of the person is not known in advance, in a situation of time pressure, then this rescue operation is part of the definition of HEMS.

(~~e~~f) 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.

(~~f~~g) HEMS operational sites

The HEMS philosophy attributes the appropriate levels of risk for each operational site; this is derived from practical considerations and in consideration of the probability of use. The risk is expected to be inversely proportional to the amount of use of the site. The types of sites are as follows:

(1) HEMS operating base: from which all operations will start and finish. There is a high probability of a large number of take-offs and landings at this HEMS operating base and for that reason no alleviation from the operating procedures or performance rules are contained in this Subpart.

(2) HEMS operating site: because this is the primary pick-up site related to an incident or accident, its use can never be preplanned and therefore attracts alleviations from operating procedures and performance rules, when appropriate.

(3) Additional HEMS operating site: each HEMS mission is different, especially in mountainous areas where the crew and helicopter need to adapt to different conditions. High altitude, unstable wind conditions, degraded vision, and difficult terrain are some of the characteristics of HEMS operations. Sometimes, the mission requires an additional HEMS operating site to be used, due to performance issues (weight reduction by unloading equipment), for hook preparation and stowage, or for dispatching ground rescue units when the accident or rescue site is not reachable.

(~~3~~4) The hospital site: is usually at ground level in hospital grounds or, if elevated, on a hospital building. It may have been established during a period when performance criteria were not a consideration. The amount of use of such sites depends on their location and their facilities; normally, it will be greater than that of the HEMS operating site but less than for a HEMS operating base. Such sites attract some alleviation under this Subpart.

(~~g~~h) Problems with hospital sites are ~~explained~~ described in GM1 CAT.POL.H.225.

~~During implementation of the original HEMS rules contained in 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 engine failure are eliminated, or limited by the exposure time concept, a number of landing sites exist that do not (or never can) allow operations to performance class 1 or 2 requirements.~~

~~These sites are generally found in a congested hostile environment:~~

~~(1) in the grounds of hospitals; or~~

~~(2) on hospital buildings.~~

~~The problem of hospital sites is mainly historical and, whilst the authority could insist that such sites are not used – or used at such a low weight that critical engine 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 attracts alleviation, 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.~~

~~It is felt that the use of public interest sites should be controlled. This will require that a State directory of sites be kept and approval given only when the operator has an entry in the route manual section of the operations manual.~~

~~The directory (and the entry in the operations manual) should contain for each approved site:~~

~~(i) the dimensions;~~

~~(ii) any non-conformance with ICAO Annex 14;~~

~~(iii) the main risks; and~~

~~(iv) the contingency plan should an incident occur.~~

~~Each entry should also contain a diagram (or annotated photograph) showing the main aspects of the site.~~

(~~h~~i) Summary

In summary, the following points are considered to be pertinent to the HEMS philosophy and HEMS regulations:

(1) absolute levels of safety are conditioned by society;

(2) potential risk must only be to a level proportionate to the task;

(3) protection is afforded at levels appropriate to the occupants;

(4) this Subpart addresses a number of risk areas and mitigation is built in;

(5) only HEMS operations are dealt with by this Subpart;

(6) there are three main categories of HEMS sites and each is addressed appropriately; and

(7) State alleviation from the requirement at a hospital site is available but such alleviations should be strictly controlled by a system of registration.

20. The following GM1 SPA.HEMS.100(c) is inserted:

GM1 SPA.HEMS.100(c) Helicopter emergency medical service (HEMS) operations

HEMS OPERATIONS AT NIGHT WITHOUT NVIS

(a) A pre-surveyed HEMS operating site is a site that has been surveyed by day, is included in an operator's operating site directory, and is re-surveyed on a regular basis.

(b) For the purpose of taking off at night after a landing by day, the HEMS operating site need not be included in the operating site directory.

21. The following AMC1 SPA.HEMS.105(b) is inserted:

AMC1 SPA.HEMS.105(b) HEMS HEC operations

HEMS HEC CARGO SLING OPERATIONS

(a) During HEMS HEC cargo sling operations, the operator should ensure that a trained crew member is in charge of:

(1) ensuring that the rope is safely connected to the helicopter hook; and

(2) when relevant, guiding the pilot from the cabin, from the ground, or when carried externally.

(b) A sling technical crew member is a person tasked with any task defined in (a) above.

(c) The operator should ensure that a person securing themselves or other persons to the rope is trained in accordance with ORO.GEN.110(e). The person should be nominated by the operator or should be part of an external organisation contracted by the operator. If the person is part of an external organisation, ORO.GEN.205 applies. The person may be a sling technical crew member.

(d) The sling technical crew member may be the HEMS technical crew member if both the training and checking requirements of the HEMS technical crew members and sling technical crew members are met.

(e) The sling technical crew member and the equipment, training, checking and briefing of the person nominated in (c) should be as defined for task specialists in paragraph (e) of AMC1 SPO.SPEC.HEC.100.

(f) The sling technical crew member should be equipped with communication equipment and personal protective equipment meeting the criteria of points (c)(3) and (c)(4) of AMC1 SPO.SPEC.HEC.100.

(g) When conducting single-pilot vertical reference operations with no assistance of a crew member, additional engine monitoring in the pilot line of vision or an audio warning system is recommended;

(h) A pilot involved in HEMS HEC cargo sling operations should be trained and experienced as defined in paragraphs (b) and (d) of AMC1 SPO.SPEC.HEC.100.

(i) A pilot involved in HEMS HEC cargo sling operations should complete a flight check at least annually to demonstrate competence in carrying out HEMS HEC operations. The checking may be combined with the line check or with a HEC training flight. If the operator is involved in HEMS HEC cargo sling operations by night, the flight check should take place by night.

(j) A pilot involved in HEMS HEC cargo sling operations should have completed in the last 90 days:

(1) when operating by day: any combination of three day or night cycles, each of which shall include a transition to and from the hover;

(2) when operating by night: three night cycles, each of which shall include a transition to and from the hover.

Cycles may include HEMS HEC cargo sling cycles, SPO.SPEC.HEC cycles, SPO.SPEC.HESLO cycles or hoist cycles.

(k) In the context of HEMS, the validity period of flight and technical crew recurrent training and checking as well as recency should be as specified in AMC1 ORO.FC.145(g).

(l) HEMS HEC standard operating procedures (SOPs) should be developed in accordance with paragraphs (g) and (h) of AMC1 SPO.SPEC.HEC.100.

22. The following AMC1 SPA.HEMS.105(b)(2) is inserted:

AMC1 SPA.HEMS.105 (b)(2) HEMS HEC operations

AIRWORTHINESS APPROVAL FOR THE CARGO HOOK

A double cargo hook installation should be considered to satisfy the airworthiness criteria for HEMS HEC operations if it meets the criteria of AMC1 SPO.SPEC.HEC.105(b).

A cargo hook system other than a double cargo hook should meet the provisions of point (a) of AMC1 SPO.SPEC.HEC.105(b).

23. The following AMC1 SPA.HEMS.110(b) is inserted:

AMC1 SPA.HEMS.110(b) Equipment requirements for HEMS operations

MOVING MAP DISPLAYS

The moving map display should show the relative altitude of the surrounding terrain and obstacles to that of the helicopter, and may be any of the following:

(a) an HTAWS that is airworthiness approved;

(b) a display that is integrated in the cockpit environment and is airworthiness approved;

(c) a type B EFB software application.

The database should cover the area where the helicopter usually performs HEMS operations.

24. The following GM1 SPA.HEMS.110(b) is inserted:

GM1 SPA.HEMS.110(b) Equipment requirements for HEMS operations

MOVING MAPS - TRAINING

ORO.FC.125 requires difference training or familiarisation when introducing new equipment and procedures. For EFB applications, AMC4 SPA.EFB.100(b)(3) defines the related training.

In either case, the training focuses not only on the usage of the equipment or EFB application, but also on its limitations, including the following limitations of moving maps:

(a) Not all terrain and obstacles will be included in the database.

(b) In VFR, the proper selection of altitude and efficient visual scanning of the environment remain the primary means of obstacle and terrain avoidance.

(c) A type B EFB software application can only be used for increased situational awareness.

25. The following AMC1 SPA.HEMS.110(d)(3) is inserted:

AMC1 SPA.HEMS.110(d)(3) Equipment requirements for HEMS operations

SHORT EXCURSIONS ABOVE 13 000 ft WITHOUT OXYGEN

(a) The operator should meet either of the following:

(1) The operator should comply with the maximum flight altitude and the maximum duration of the excursion above 10 000 ft without oxygen as defined in table 1; or

(2) If the operator expects flight durations above 10 000ft greater than 15 minutes but no greater than 30 minutes, combined with a maximum altitude between 14 000 and 16 000 feet, the operator should define its own limitations within these boundaries based on scientific evidence of no risk of hypoxia.

Table 1

Maximum altitude	*Maximum duration of the excursion above 10 000 ft*
14 000 ft	*30 minutes*
16 000 ft	*15 minutes*

26. The following GM1 SPA.HEMS.110(d)(3) is inserted:

GM1 SPA.HEMS.110(d)(3) Equipment requirements for HEMS operations

SHORT EXCURSIONS ABOVE 13 000 ft WITHOUT OXYGEN

(a) The duration of the excursion includes all time spent above 10 000 ft during the HEMS mission. This includes:

(1) All time spent on ground above 10 000 ft.

(2) All time spent in flight above 10 000 ft within a single HEMS mission.

(b) The HEMS mission ends on return to base. Temporarily flying below 10 000 ft without returning to base does not reset the duration of the excursion.

27. The following AMC1 SPA.HEMS.110(d)(6)&(d)(7) is inserted:

AMC1 SPA.HEMS.110(d)(6)&(d)(7) Equipment requirements for HEMS operations

SHORT EXCURSIONS ABOVE 13 000 FT WITHOUT OXYGEN

If the operator or an individual crew member has no experience in flying without oxygen above 13 000 ft, then the operator should set, based on a risk assessment, operating conditions or individual limitations for crew members to progressively gain experience and adapt to altitude.

The limitations may restrict the maximum duration spent above 10 000 ft, or the maximum altitude, and should be removed when no longer relevant.

The altitude of the HEMS operating base should be taken into account to assess the physiological adaptation of the crew member to high altitudes.

28. The following AMC1 SPA.HEMS.110(d)(8) is inserted:

AMC1 SPA.HEMS.110(d)(8) Equipment requirements for HEMS operations

HYPOXIA TRAINING

(a) Required crew members planning to fly above 13 000 ft without oxygen should have training aimed at the following:

(1) Knowing themselves and identifying early signs of hypoxia; and

(2) Recognising early signs of hypoxia in other crew members.

(b) the crews should undergo both theoretical and practical training.

(c) The theoretical training should take place every 3 years and should include the learning objectives of module 050 of the CPL/ATPL theoretical knowledge that are relevant to hypoxia, as defined in annex I of Regulation 1178/2011 (part-FCL)

(d) The initial and recurrent practical training of (a)(1) should take place every 6 years and should take place in one of the following:

(1) in a hypobaric chamber that simulates an altitude for a sufficient duration for hypoxia to occur in an oxygen-deprivation scenario that is representative of a helicopter mission.

(2) using a device that ensures that the gas the trainee breathes has the same partial pressure of oxygen as the desired altitude, for a sufficient duration for hypoxia to occur in an oxygen-deprivation scenario that is representative of a helicopter mission. (eg. Reduced oxygen breathing device);

(3) in a helicopter at the altitude required for the individual trainee to experience hypoxia, for the recurrent training only, provided that the trainee is in the cabin with medical assistance and an instructor using oxygen is able to ensure the safety of the training.

(e) The initial and recurrent practical training of (a)(2) should take place every 6 years and should take place in one of the following:

(1) The trainee should not be deprived of oxygen and should observe another crew member that undergoes the training described in (d) and that becomes hypoxic.

(2) the training takes place in a helicopter / FSTD where the instructor plays the role of a hypoxic crew member. The instructor should have attended at least 6 training sessions described under (d) as an observer or instructor or active crew member. In this case neither the trainee nor the instructor need to be deprived of oxygen.

(f) In the context of hypoxia training, the validity period of flight and technical crew recurrent training should be as specified in AMC1 ORO.FC.145(g).

29. The following AMC1 SPA.HEMS.110(e)(1) is inserted:

AMC1 SPA.HEMS.110(e)(1) Equipment requirements for HEMS operations

SUITABLE STABILITY AUGMENTATION SYSTEM (SAS) OR AUTOPILOT

The SAS or autopilot should at least have the following functions:

(a) pitch rate damping and attitude / attitude rate stabilisation;

(b) roll rate damping and attitude / attitude rate stabilisation; and

(c) yaw damping.

30. The following AMC1 SPA.HEMS.110(e)(2) is inserted:

AMC1 SPA.HEMS.110(e)(2) Equipment requirements for HEMS operations

AUTOPILOT

The autopilot should at least have the following functions:

(a) attitude hold;

(b) Altitude hold mode; and

(c) Heading hold mode.

31. The following AMC1 SPA.HEMS.120(a) is inserted:

AMC1 SPA.HEMS.120(a) HEMS operating minima

HEMS VFR MINIMA: CEILING, CLOUD BASE AND VISIBILITY

(a) The operator should define minimum ceiling, cloud base and visibility no lower than defined in table 1.

Table 1			
HEMS operating minima			
DAY			
Ceiling		Visibility	
500 ft and above		As defined by the applicable airspace VFR minima (*)	
499–300 ft		1 500 m (*)	
NIGHT			
NVIS		No NVIS	
Cloud base (***)	Visibility	Cloud base(***)	Visibility
1 200 ft (**)	3 000 m	1 200 ft (**)	5 000 m
		1 500 ft (**)	3 000 m

(*) During the en-route phase, 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 other traffic or any obstacles in time to avoid a collision.

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

(***) For the dispatch phase, ceiling can be used instead of cloud base if the clouds below the ceiling are not relevant to the planned flight path

REDUCED VFR MINIMA TO BE USED WHEN INSTRUCTED TO 'PROCEED VFR'

(b) The operator may define lower HEMS operating minima than those defined in Table 1 above, when an IFR departure or approach chart instructs the pilot to 'proceed VFR' prior to an IFR departure or following an IFR approach procedure, both for day and night. If the corresponding HEMS operating minima for the VFR segment of this flight are lower than those defined in Table 1, they should not be lower than those defined in Tables 2 and 3 below. The applicable minima should be published in the operations manual.

Table 2		
Reduced HEMS operating minima **when instructed to 'proceed VFR' following an instrument approach**		
x is the distance between the missed approach point (MAPt) and the heliport or operating site		
DAY		
	Visibility	Ceiling
x ≤ 1 500 m	x but at least 800 m	MDH
X > 1 500 m	1500 m	MDH or 300 ft (*)
NIGHT		
	Visibility	Ceiling
x < 2 000 m	x + 500 m but at least 1 500 m	MDH
with NVIS: 2 000 ≤ x < 5 000 m	2500 m	MDH or 400 ft (*)
no NVIS: 2 000 ≤ x < 5 000 m	x+500 or3000 m whichever is lower	MDH or 500 ft (*)

(*) whichever is higher

Table 3		
Reduced HEMS operating minima **when instructed to 'proceed VFR' prior to an IFR departure**		
x is the distance between the heliport or operating site and the initial departure fix (IDF)		
DAY		
	Visibility	Crossing height at IDF
x ≤ 3000 m	800 m	Crossing height at IDF
3 000 m < x ≤ 5 000 m	1500 m	Crossing height at IDF
NIGHT		
	Visibility	Ceiling
x < 2 500 m	x but at least 1500 m	Crossing height at IDF
with NVIS: 2 500 ≤ x < 5 000 m	2500 m	Crossing height at IDF
no NVIS: 2 500 ≤ x < 5 000 m	x or3000 m whichever is lower	Crossing height at IDF

HEMS VFR OPERATING MINIMA: VERTICAL DISTANCE TO OBSTACLES

(c) When operating VFR in HEMS below minimum flight altitudes prescribed by the rules of the air or with visibility lower than prescribed in the rules of the air, the operator should define in the operations manual:

(1) Minimum safe cruising height(s) for the area(s) overflown, minimum distance to obstacles and, when necessary, appropriate maximum helicopter speed(s);

(2) During the cruise phase, the minimum safe height (safety height) over relevant obstacles in the flight path for VFR operations should not be less than 200 feet during the day and 500 feet during the night.

32. The following GM1 SPA.HEMS.120(a) is inserted:

GM1 SPA.HEMS.120(a) HEMS operating minima

HEMS VFR OPERATING MINIMA: MISCELLANEOUS

Requirements in the rules of the air to remain out of clouds or in sight of the surface are unaffected by the HEMS VFR operating minima. Minimum horizontal distances to obstacles are also unchanged.

33. The following AMC1 SPA.HEMS.120(d) is inserted:

AMC1 SPA.HEMS.120(d) HEMS operating minima

TASKS AND QUALIFICATION OF THE HEMS TECHNICAL CREW MEMBER

The HEMS technical crew member should be considered to be suitably qualified for the purpose of using the HEMS minima if he or she has completed the training for all the following tasks and is effectively tasked with them, as defined in AMC1 SPA.HEMS.130(e):

(a) training for the primary tasks of the technical crew member;

(b) navigation training;

(c) communications training;

(d) monitoring training.

34. GM1 SPA.HEMS.120 is amended as follows:

GM1 SPA.HEMS.120 HEMS operating minima

REDUCED VISIBILITY

(a) ~~In the rule the~~ The ability to reduce the visibility for short periods has been included. This will allow 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. Since every situation is different it was not felt appropriate to define the short period in terms of absolute figures. It is for the commander to assess the aviation risk to third parties, the crew and the aircraft such that it is proportionate to the task, using the principles of GM1 SPA.HEMS.100(a).

[…]

35. The following GM2 SPA.HEMS.120 is inserted:

GM2 SPA.HEMS.120 HEMS operating minima

HEMS TRAINING MINIMA

When conducting a HEMS training flight, the HEMS operating minima are applicable.

36. The following AMC1 SPA.HEMS.125(a)(3) is inserted:

AMC1 SPA.HEMS.125(a)(3) Performance requirements for HEMS operations

PERFORMANCE CLASS 3 WITH A HELICOPTER NOT CERTIFIED AS CATEGORY A OR EQUIVALENT

(a) if a stretcher is likely to be necessary for the mission, the helicopter should be able to carry a deployed stretcher without preventing the two pilots, or a pilot and a HEMS crew member, from occupying the two forward-facing seats in the cockpit.

(b) The planned mission should remain outside of congested hostile areas and should be completed by sunset.

(c) The operator should ensure that a category A helicopter is dispatched in case the HEMS mission unexpectedly needed to be continued by night, or it unexpectedly required a HEMS flight into a congested hostile area.

(d) The operator should record the following for each mission. The following records should be kept for 3 years:

(1) The criteria that the operator used for the dispatch in accordance with SPA.HEMS.125 (a)(3)

(2) The criteria that the operator used for the dispatch as described in (a) and (b) above

(3) The contingency options that were available to meet (c), and whether they were triggered or not.

(4) all elements relevant to the mission including destinations, altitude, weather conditions, mass and balance.

37. The following AMC1 SPA.HEMS.125(a) is inserted:

AMC1 SPA.HEMS.125(a) Performance requirements for HEMS operations

CRASH-RESISTANT FUEL SYSTEMS

A crash-resistant fuel system is a system that has been demonstrated to comply with CS 27.952(a)(1)(2)(3)(5)&(6), CS 27.952.(f), and CS 27.963(g) initial issue of 14 November 2003 (or any subsequent amendment) or CS 29.952(a)(1)(2)(3)(5)&(6), CS 29.952(f), and CS 29.963(b) initial issue of 14 November 2003 (or any subsequent amendment) orone of the following or equivalent:

(a) FAR 27.952(a)(1)(2)(3)(5)&(6), FAR 27.952.(f), and FAR 27.963(g) at amendment 27-30 of 2 Nov 1994 or any subsequent amendment.

(b) FAR 29.952(a)(1)(2)(3)(5)&(6), FAR 29.952(f), and FAR 29.963(b) at amendment 29-35 of 2 Nov 1994 or any subsequent amendment.

(c) JAR 27.952(a)(1)(2)(3)(5)&(6), JAR 27.952.(f), and JAR 27.963(g) change 0 of 6 Sep 1993 or any subsequent amendment.

(d) JAR 29.952(a)(1)(2)(3)(5)&(6), JAR 29.952(f), and JAR 29.963(b) change 0 of 5 November 1993 or any subsequent amendment.

NOTE: If compliance with CS 27.952 (a)(4), CS 29.952 (a)(4), FAR 27.952 (a)(4), FAR 29.952 (a)(4), JAR 27.952 (a)(4) or JAR 29.952 (a)(4) is addressed then only 114 kg (250lbs) is required under CS 27.963(g), CS 29.963(b), FAR 27.963(g), FAR 29.963(b), JAR 27.963(g) or JAR 29.963(b).

38. The following GM1 SPA.HEMS.125(a) is inserted:

GM1 SPA.HEMS.125(a) Performance requirements for HEMS operations

CRASH-RESISTANT FUEL SYSTEMS

The operator may ensure compliance of the fuel system based on a statement by the type-certificate or supplemental type-certificate holder.

39. The current GM1 SPA.HEMS.125(b)(3) is re-numbered as follows:

GM1 SPA.HEMS.125(~~b~~c)(3) Performance requirements for HEMS operations

PERFORMANCE CLASS 2 OPERATIONS 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 does not call for the additional risk assessment that is specified in CAT.POL.H.305 (b)(1).

40. The following GM2 SPA.HEMS.125(c)(3) is inserted:

GM2 SPA.HEMS.125(c)(3) Performance requirements for HEMS operations

Except for the initial part of the training, the operator may define HEMS operating sites for the purpose of HEMS training and checking, including training for HEMS HEC operations.

The operator's risk assessment may take the following into consideration when defining such HEMS operating sites:

(a) altitude;

(b) direction of the approach to the operating site;

(c) prevalent winds;

(d) site weather conditions and operating limitations;

(e) whether there are safe forced landing options, the helicopter has flyaway capability, or none of these;

(f) performance margins regarding hover out of ground effect (HOGE) capability, considering the expected average temperature for exercise;

(g) any defined escape routes during operations;

(h) the maximum number of people on board during manoeuvres in addition to the flight crew and technical crew members.

The training and checking may involve all personnel necessary to the HEMS mission.

41. The current AMC1 SPA.HEMS.125(b)(4) is re-numbered and amended as follows:

AMC1 SPA.HEMS.125(~~b~~c)(4) Performance requirements for HEMS operations

CRITERIA FOR THE HEMS OPERATING SITE ~~DIMENSIONS~~

(a) ~~When selecting~~ In order to select a HEMS operating site from the air, the operator should either: ~~it should~~

(1) Define minimum HEMS operating site dimensions of at least 2 × D by day (the largest dimensions of the helicopter when the rotors are turning) and at least 4 × D in length and 2 × D in width by night, to be estimated by the crew from the air; or ~~have a minimum dimension 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.~~

(2) Define alternative criteria for the HEMS operating site together with operating procedures and training, which mitigate the risks identified in the operator's risk assessment. In this case the operator may choose not to define minimum site dimensions. By night, for operations other than HEC, the HEMS operating site should include an area that the crew estimates to be least at least 4 × D in length and 2 × D in width, which should be free of relevant obstacles.

~~(b) For night operations, the illumination may be either from the ground or from the helicopter.~~

(b) the pre-surveyed HEMS operating site dimensions should be at least 2 × D.

(c) The operator may provide guidelines to its commanders on whether to land, proceed with eg. a one-skid landing, hover landing or proceed with HEMS HEC operations. The commander should decide which technique to employ.

(d) Before operating at a HEMS operating site, the commander should estimate whether it is suitable for safe operations based on the above and on the environmental conditions.

42. The following AMC2 SPA.HEMS.125(c)(4) is inserted:

AMC2 SPA.HEMS.125(c)(4) Performance requirements for HEMS operations

ILLUMINATION OF HEMS OPERATING SITES AT NIGHT

For night operations, the illumination should be sufficient to allow the pilot to:

(a) identify the landing area in flight and determine the landing direction; and

(b) make a safe approach, landing and take-off.

43. The following GM1 SPA.HEMS.125(c)(4) is inserted:

GM1 SPA.HEMS.125(c)(4) Performance requirements for HEMS operations

ILLUMINATION OF HEMS OPERATING SITES AT NIGHT

A landing site may provide additional illumination from the ground, which complement the illumination from the helicopter but does not replace it. Some ground lights might contribute to blinding or masking obstacles.

44. The following AMC1 SPA.HEMS.130 is inserted:

AMC1 SPA.HEMS.130 Crew requirements

FLIGHT CREW AND TECHNICAL CREW - VALIDITY OF RECURRENT TRAINING AND CHECKING

In the context of HEMS, the validity period of recurrent training and checking of all crew members should be as specified in AMC1 ORO.FC.145(g).

45. The following AMC1 SPA.HEMS.130(a) is inserted:

AMC1 SPA.HEMS.130(a) Crew requirements

HEMS COMMANDER MINIMUM EXPERIENCE

The minimum experience level for the commander who conducts HEMS flights should not be less than:

(a) either:

(1) 1 000 hours as pilot-in-command/commander of aircraft, of which 500 hours are as pilot-in-command/commander on helicopters; or

(2) 1 000 hours as co-pilot in HEMS operations of which at least 500 hours are as pilot-in-command under supervision, and 100 hours as pilot-in-command/commander on helicopters;

(b) 500 hours' operating experience in helicopters, gained in an operational environment similar to the intended operation; and

(c) for pilots engaged in restricted night operations that do not include landing at night at HEMS operating sites, 20 hours of VMC at night as pilot-in-command/commander.

(d) for pilots engaged in unrestricted night operations:

(1) 30 hours of VMC at night, to which 3 hours may be credited for every hour flown as part of a structured night HEMS training programme on a suitable FSTD. The structured training programme may be part of the operator conversion course or command course of the HEMS operator. This experience comes in addition to point (c).

(2) 10 approaches, landings and take-offs by night at operating sites in an operational environment similar to the intended operation in the helicopter or in a FFS level D.

46. The current AMC1 SPA.HEMS.130(b)(2) is deleted:

~~**AMC1 SPA.HEMS.130(b)(2) Crew requirements**~~

~~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.).~~

47. AMC1 SPA.HEMS.130(d) is amended as follows:

AMC1 SPA.HEMS.130(d) Crew requirements

~~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.~~

FLIGHT TRAINING WITH SOLE REFERENCE TO INSTRUMENTS

(a) The flight training should include training as pilot flying with sole reference to instruments.

(b) The training duration should be at least 45 minutes.

(c) The training should be conducted by a FI/TRI/SFI and should be sufficient for the pilot to demonstrate competence in recovery from inadvertent entry into IMC conditions including the following manoeuvres:

(1) transition to instrument flight during climb-out;

(2) climbing and descending turns on to specified headings;

(3) level flight, control of heading, altitude and speed;

(4) level turns with 30 degrees bank, 180 to 360 degrees left and right;

(5) recovering from unusual attitudes;

(6) emergency let-down procedures;

(7) at least every 12 months, use of the autopilot including upper modes, if fitted.

(e) The instrument flight training should take place in a helicopter FSTD that is suitable for the training, or if no suitable FSTD is available in a helicopter using vision-limiting devices such as goggles or screens. The helicopter used for the training should be a helicopter type used in the HEMS operation. The helicopter is not required to be certified for IFR operations.

48. AMC1 SPA.HEMS.130(e) is amended as follows:

AMC1 SPA.HEMS.130(e) Crew requirements

HEMS TECHNICAL CREW MEMBER

(a) When the crew is composed of one pilot and one HEMS technical crew member, the latter should be seated in the forward-facing front seat (co-pilot seat) during the flight.

By day the HEMS technical crew member may be seated in the cabin at the discretion of the commander if all of the following conditions are met:

(1) the HEMS technical crew member is likely to be tasked with HEMS HEC duties from the cabin during the HEMS mission;

(2) the flight is conducted to or from a HEMS operating site;

(3) the operator's risk assessment determines that the technical crew member can carry out his or her primary tasks from the cabin; this risk assessment may determine that the rear door(s) needs (need) to remain open for better visibility;

By day and by night, The HEMS technical crew member may also re-position from the front seat to the cabin and back during the flight, if conditions(a)(1) to (a)(3) and all the following additional conditions are met:

(4) the risk assessment determines that the technical crew member can safely move from one position to the other;

(5) the helicopter is so equipped that the repositioning does not result in inadvertent interference with flight controls or aircraft systems;

(6) the operator defines SOPs for the re-positioning;

(7) The operator defines initial and recurrent training towards these SOPs as well as recency requirements for technical crew members involved; and for night operations the training takes place by night.

(8) For night operations, the operator should define criteria to determine whether the HEC operation takes place with sufficient visual references at pre-flight stage and on-site.

(9) By night, the commander should determine whether the pre-flight criteria defined in (8) are likely to be met without the use of NVG, and on-site, whether the criteria are met without the use of NVG. The commander should only use the procedure if the criteria are met.

(b) The primary tasks of the HEMS technical crew members are to assist the commander in:

~~, so as to be able to carry out his/her primary task of assisting the commander in:~~

(1) collision avoidance;

(2) the selection of the landing site; ~~and~~

(3) the detection of obstacles during approach and take-off phases~~.~~; and

(4) the reading of checklists when seated in the front seat.

(~~b~~c) The commander may delegate other aviation tasks to the HEMS technical crew member, as necessary:

(1) assistance in navigation;

(2) assistance in radio communication/radio navigation means selection;

(3) If properly qualified and licenced, radio communication;

(~~3~~4) reading of checklists from the cabin; and

(~~4~~5) monitoring of parameters.

(~~c~~d) The commander may also delegate to the HEMS technical crew member tasks on the ground, as necessary:

(1) assistance in preparing the helicopter and dedicated medical specialist equipment for subsequent HEMS departure; ~~or~~

(2) assistance in the application of safety measures during ground operations with rotors turning (including: crowd control, embarking and disembarking of passengers, refuelling etc.).

(~~d~~e) There may be exceptional circumstances when it is not possible for the HEMS technical crew member to carry out his or her ~~his/her~~ primary task as defined under (b~~a~~).

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.~~)~~

(~~e~~f) 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.

(g) The operator should consider that a HEMS technical crew member is inexperienced until he or she has completed 50 HEMS missions. The operator may include HEMS missions flown during line flying under supervision.

(h) When an inexperienced HEMS technical crew member is part of the crew, the following should apply:

(1) the pilot has achieved 50 flight hours on the type within a period of 60 days since the completion of the operator's conversion course on the type; or

(2) the pilot has achieved 100 flight hours on the type since the completion of the operator's conversion course on the type.

(i) A smaller number of flight hours or missions as defined in (g) or (h) above, and subject to any other conditions which the competent authority may impose, may be acceptable to the competent authority when one of the following applies:

(1) a new operator commences operations;

(2) an operator introduces a new helicopter type;

(3) the pilot has previously completed a type conversion course with the same operator (reconversion);

(4) credits are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012.

49. The following AMC1 SPA.HEMS.130(e)(1)(iii) is inserted:

AMC1 SPA.HEMS.130(e)(1)(iii) Crew requirements

SINGLE-PILOT OPERATIONS WITH NO TECHNICAL CREW MEMBER

(a) The commander should decide whether he or she needs the assistance of a technical crew member, or if the technical crew member can be relieved from flight duties to provide medical assistance from the cabin or on site.

(b) When relieved from flight duties at a HEMS operating site, the technical crew member should take part in the departure briefing that summarises the relevant obstacles and threats.

50. The current GM1 SPA.HEMS.130(e)(2)(ii) is deleted:

~~GM1 SPA.HEMS.130(e)(2)(ii) Crew requirements~~

~~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 an topography make it~~

~~unlikely that the visual cues would degrade sufficiently to make flying of the aircraft problematical, the HEMS technical crew member is assumed to be able to sufficiently assist the pilot, since under such circumstances instrument and control monitoring would not be required. In those cases where instrument and control monitoring would be required the operations should be conducted with two pilots.~~

51. The current AMC1 SPA.HEMS.130(e)(2)(ii)(B) is deleted:

~~**AMC1 SPA.HEMS.130(e)(2)(ii)(B) Crew requirements**~~

~~FLIGHT FOLLOWING SYSTEM~~

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

52. AMC1 SPA.HEMS.130(f)(1) is amended as follows:

AMC1 SPA.HEMS.130(f)(1) Crew requirements

FLIGHT CREW TRAINING AND CHECKING SYLLABUS

(a) The flight crew initial and recurrent training syllabus should include the following items:

(1) meteorological training focusing~~concentrating~~ on the understanding and interpretation of available weather information;

(2) preparing the helicopter and specialist medical equipment for subsequent HEMS departure;

(3) practice of HEMS departures;

(4) the assessment from the air of the suitability of HEMS operating sites; and

(5) the medical effects air transport may have on the patient.

(b) Single-pilot operations

(1) The flight crew training syllabus should include initial and annual recurrent helicopter/FSTD training focusing on crew cooperation with the technical crew member.

(2) The initial training should include at least 4 hours flight instruction dedicated to crew cooperation unless:

(i) the pilot holds a certificate of satisfactory completion of a multi-crew cooperation course in accordance with Commission Regulation (EU) No 1178/2011[3]; or

(ii) the pilot has at least 500 hours in either multi-pilot operations or single-pilot operations with a HEMS or equivalent technical crew member, or a combination of these.

[3] OJ L 311, 25.11.2011, p. 1.

(3) The training described in (1) and (2) above should be organised with a crew composition of one pilot and one technical crew member.

(4) The training described in (3) should be conducted by a suitably qualified commander with a minimum experience of 350 hours in either multi-pilot operations or single-pilot operations with a HEMS technical crew member, or a combination of these.

(~~b~~c) The flight crew checking syllabus should include:

(1) proficiency checks, which should include landing and take-off profiles likely to be used at

HEMS operating sites; and

(2) line checks, with special emphasis on all of the following:

(i) local area meteorology;

(ii) HEMS flight planning;

(iii) HEMS departures;

(iv) the selection from the air of HEMS operating sites;

(v) low-level flight in poor weather; ~~and~~

(vi) familiarity with established HEMS operating sites in the operator's local area register~~.~~;

(vii) crew cooperation.

~~(c) HEMS technical crew members should be trained and checked in the following items:~~

~~(1) duties in the HEMS role;~~

~~(2) map reading, navigation aid principles and use;~~

~~(3) operation of radio equipment;~~

~~(4) use of on-board medical equipment;~~

~~(5) preparing the helicopter and specialist medical equipment for subsequent HEMS departure;~~

~~(6) instrument reading, warnings, use of normal and emergency checklists in assistance of the~~

~~pilot as required;~~

~~(7) basic understanding of the helicopter type in terms of location and design of normal and~~

~~emergency systems and equipment;~~

~~(8) crew coordination;~~

~~(9) practice of response to HEMS call out;~~

~~(10) conducting refuelling and rotors running refuelling;~~

~~(11) HEMS operating site selection and use;~~

~~(12) techniques for handling patients, the medical consequences of air transport and some~~

~~knowledge of hospital casualty reception;~~

~~(13) marshalling signals;~~

~~(14) underslung load operations as appropriate;~~

~~(15) winch operations as appropriate;~~

~~(16) the dangers to self and others of rotor running helicopters including loading of patients; and~~

~~(17) the use of the helicopter inter-communications system.~~

53. The following AMC2 SPA.HEMS.130(f)(1) is inserted:

AMC2 SPA.HEMS.130(f)(1) Crew requirements

HEMS TECHNICAL CREW MEMBER TRAINING AND CHECKING SYLLABUS

INITIAL AND RECURRENT TRAINING COVERING PRIMARY TASKS
(as defined in AMC1 SPA.HEMS.130(e), paragraph (b), in SPA.HEMS.130 points (e)(3) and (f)(2) and in SPA.HEMS.155)

(a) HEMS technical crew member initial and recurrent training and checking syllabus should include the following items:

(1) applicable laws and regulations

(2) Helicopter general knowledge:

(i) stowage, cabin safety and use of on-board medical equipment

(ii) general knowledge of helicopter operations

(3) Meteorology

(4) Operational procedures

(i) company procedures

(ii) duties in the HEMS role

(ii) response to HEMS dispatch

(iii) HEMS operating site selection and use

(iv) patients

(v) Portable electronic devices and electronic flight bags, as applicable

(5) crew coordination including check-lists

(6) Human performance and limitations, CRM

(7) Flight safety

(i) general flight safety in helicopter operations

(ii) obstacle and traffic clearance

(iii) handling of abnormal and emergency situations including check-lists

(iv) dangerous goods (DGs), as relevant for HEMS operation

(8) security

NAVIGATION TRAINING

(as defined in AMC1 SPA.HEMS.130(e), paragraph (c)(1) and (c)(2) (navigation))

(b) If the HEMS technical crew member is tasked to provide assistance in navigation, the initial and recurrent training and checking syllabus should also include the following items:

(1) applicable parts of SERA, as relevant to the navigation tasks of the HEMS crew member

(2) Basic navigation training

(3) navigation aid principles and use

(4) airspace, restricted areas, and noise-abatement procedures

(5) crew coordination

COMMUNICATION TRAINING

(as defined in AMC1 SPA.HEMS.130(e), paragraph (c)(2) and (c)(3)(communications))

(c) If the HEMS technical crew member is tasked to provide assistance in radio communications, the initial and recurrent training and checking syllabus should also include the following items:

(1) operation of relevant radio equipment;

(2) crew coordination.

MONITORING TRAINING

(as defined in AMC1 SPA.HEMS.130(e), paragraph (c)(5))

(d) If the HEMS technical crew member is tasked to provide assistance in monitoring the flight path and instruments, the initial and recurrent training and checking syllabus should also include the following items:

(1) general knowledge of helicopter operations

(2) monitoring function

(3) crew coordination

(4) Handling of abnormal and emergency situations, as applicable

GROUND CREW TRAINING

(as defined in AMC1 SPA.HEMS.130(e), paragraph (d))

(e) If the HEMS technical crew member is tasked to provide assistance to the helicopter on the ground, the initial and recurrent training and checking syllabus should also include the following items as applicable to their tasks:

(1) safety and security at the HEMS operating site;

(2) the dangers to self and others of rotor running helicopters, including loading of patients;

(3) preparing the helicopter and specialist medical equipment for subsequent HEMS departure;

(4) conducting refuelling, and conducting refuelling with rotors running;

(5) marshalling signals;

(6) safety on the aerodrome/operating site, including fire prevention and ramp safety areas; and

(7) towing of helicopter/trolley.

ADDITIONAL TRAINING (AS APPROPRIATE)

(f) The initial and recurrent training and checking syllabus should also include the following items as relevant to the operations:

(1) HEMS HEC cargo sling operations, as defined in AMC1 SPA.HEMS.105(b);

(2) hoist operations, as defined in SPA.HHO;

(3) NVIS, as defined in SPA/NVIS;

(4) IFR/PBN.

CONVERSION COURSE GROUND TRAINING AND CHECKING WHEN CHANGING HELICOPTER TYPES OR CHANGING OPERATORS

(g) The conversion course ground training and checking when changing helicopter types should include the elements of (a) to (f) above that are relevant to the new helicopter type.

(h) The conversion course ground training and checking when changing operators should include the elements of (a) to (f) above that are relevant in the context of changing operators.

INITIAL AIRCRAFT/FSTD TRAINING

(i) The technical crew member training syllabus should include helicopter/FSTD training focusing on crew cooperation with the pilot.

(1) The initial training should include at least 4 hours instruction dedicated to crew cooperation unless:

(i) the HEMS crew member has undergone this training under another operator; or

(ii) the HEMS crew member has performed at least 50 missions in HEMS or equivalent role as a technical crew member.

(2) The training described in (1) above should be organised with a crew composition of one pilot and one technical crew member.

(3) The training may be combined with the line flying under supervision.

LINE FLYING UNDER SUPERVISION

(j) Line flying under supervision

(1) Line flying under supervision should take place during the operator's conversion course.

(2) Line flights under supervision provide the opportunity for a HEMS technical crew member to practice the procedures and techniques he or she should be familiar with, regarding ground and flight operations, including any elements that are specific to a particular helicopter type. Upon completion of the line flying under

supervision, the HEMS technical crew member should be able to safely conduct the flight operational duties assigned to him or her according to the procedures laid down in the operator's operations manual.

(4) For the conversion course that takes place when joining the operator, line flying under supervision should include a minimum of five sectors. These sectors should include a minimum of one low-height en-route transit and a minimum of three HEMS operating sites that the technical crew member is not familiar with.

RECURRENT AIRCRAFT/FSTD TRAINING

(k) Recurrent helicopter/FSTD training

(1) The recurrent training should focus on crew cooperation and contain a minimum of 2 hours of flight.

(2) The training described in (1) above should take place in the same conditions as the initial training in (i) above.

(3) The validity period of the aircraft/FSTD training should be 12 calendar months.

LINE CHECKS

(l) Line checks

(1) The line check should be performed during a HEMS mission. If practically necessary, because of the difficulty to anticipate an actual HEMS activity or a cabin layout or helicopter performance making it difficult to carry an extra person, a helicopter flight representative of a HEMS mission may be carried out for the purpose of the line check.

(2) The operator's conversion course should include a line check. The line check should take place after the completion of the line flying under supervision.

(3) Any task-specific items may be checked by a suitably qualified HEMS technical crew member nominated by the operator and trained in CRM concepts and the assessment of non-technical skills.

OPERATOR PROFICIENCY CHECKS

(m) Operator proficiency checks

(1) The HEMS technical crew member should complete an operator proficiency check to demonstrate his or her competence in carrying out normal, abnormal and emergency procedures, covering the relevant aspects associated with the flight operational tasks described in the operations manual and not already covered in the line check.

(2) The conversion course should include an operator proficiency check.

(3) The operator proficiency check should be valid for a given helicopter type. In order to consider an operator proficiency check to be valid for several helicopter types, the operator should demonstrate that the types are sufficiently similar from the technical crew member's perspective.

PROVISION OF TRAINING AND CHECKING

(n) Use of FSTDs

(1) The line check and line flying under supervision should be performed in the helicopter.

(2) Notwithstanding (1), the operator may perform the line check in two parts, in a suitable FSTD and on ground, if all of the following conditions are met:

(i) The FSTD part of the line check takes place in a line-oriented evaluation;

(ii) The ground part of the line check takes place at the HEMS operating base and includes all normal operating procedures not checked in the FSTD;

(iii) Both parts of the line check are conducted within 3 months of each other

(iv) For the purpose of AMC1 SPA.HEMS.130, the line check is considered to be performed on the day when the last part of the line check is completed;

(v) for the purpose of (ii), the operator should arrange to replicate realistic conditions as much as practicable, so that normal operating procedures that take place on ground at the HEMS operating site are also checked.

(3) Operator proficiency checks and aircraft/FSTD training should be performed in an suitable FSTD or, if it is not reasonably practicable to gain access to such devices, in an aircraft of the same type.

(o) Emergency and safety equipment training should be performed in a representative training device or in an aircraft of the same type.

(p) The type of equipment used for training and checking should be representative of the instrumentation, equipment and layout of the aircraft type operated by the crew member.

(q) training and checking in the aircraft/FSTD should take place as part of the normal crew complement.

(r) The person conducting the training and checking should be a suitably qualified commander nominated by the operator. In the case of the training described in (i)(1) and (k)(1) above, the person conducting the training should have a minimum experience of 350 hours in either multi-pilot operations or single-pilot operations with a HEMS technical crew member or a combination of these. The person conducting a CRM assessment should be trained in CRM concepts and the assessment of CRM skills.

(s) notwithstanding (r), the person conducting the training and checking of tasks conducted in the cabin where crew cooperation is not essential may be a suitably qualified technical crew member nominated by the operator.

CRM ASSESSMENT OF THE HEMS TECHNICAL CREW MEMBER

(s) A CRM assessment should take place during the line check or should take place annually in a line-oriented flight scenario (LOFT or line oriented section of the OPC) of an FSTD session in a suitable FSTD. The CRM assessment in the helicopter should take place as described for pilots in AMC1 ORO.FC.230 point (b)(3)(vi) or (b)(3)(vii).

54. The following GM1 SPA.HEMS.130(f)(1) is inserted:

GM1 SPA.HEMS.130(f)(1) Crew requirements

HEMS TECHNICAL CREW MEMBER THEORETICAL TRAINING

(a) The HEMS technical crew member training and checking may be adapted to the knowledge of the technical crew member and structured as shown in Table 1.

Table 1 – HEMS technical crew member training

HEMS TECHNICAL CREW MEMBER TRAINING TRAINING TOPIC	Trainee with PPL(H)*	Trainee with PPL(A)**	Other Trainee
(1) applicable laws and regulations			
(i) introduction to the regulatory environment applicable to HEMS operations including SERA			X
(ii) HEMS philosophy and HEMS rules	X	X	X
(iii) public interest sites (PISs) if applicable	X	X	X
(2) Helicopter general knowledge			
(i) stowage, cabin safety and use of on-board medical equipment			
(A) safe storage of loose personal objects and medical equipment			X
(B) securing patients on the EMS stretcher			X
(C) influence of medical equipment usage on helicopter systems (e.g. defibrillator)	X	X	X
(ii) general knowledge of helicopter operations			
(A) general principles of flight		X	X
(B) helicopter mass and balance			X
(C) helicopter performance (including definitions of helicopter certification as category A and performance classes 1, 2 and 3)	X	X	X
(D) location and design of normal and emergency systems and equipment including all helicopter lights and operation of doors			X
(E) intercommunication system			X
(3) Meteorology			

(i) meteorology as relevant to the operating area			X
(ii) meteorology as a limiting factor for mission planning/execution			X
(4) Operational procedures			
(i) company procedures			
(A) the relevant extracts of the organisation's management manual and operations manual	X	X	X
(B) operational control and supervision	X	X	X
(ii) duties in the HEMS role			
(A) duties of the technical crew member before flight, during all flight phases and post-flight duties	X	X	X
(B) legal aspects of delegated tasks by the commander	X	X	X
(iii) response to HEMS dispatch			
(A) flight planning, preparation, and in-flight operations	X	X	X
(iv) HEMS operating site selection and use			
(A) minimum dimensions or equivalent criteria	X	X	X
(B) effects of downwash	X	X	X
(C) accessibility	X	X	X
(v) patients			
(A) aspects of landing site selection for patient transport	X	X	X
(B) patient on-/off-loading	X	X	X
(C) medical consequences of air transport on patients including influence of noise, vibration, air pressure and temperature	X	X	X
(D) consequences of hospital selection on flight (endurance, weather)	X	X	X
(E) knowledge of hospital casualty reception	X	X	X
(vi) Portable electronic devices and electronic flight bags, as applicable	X	X	X
(5) crew coordination including check-lists			
(i) crew concept	X	X	X

(ii) checklist reading philosophy, initiation, interruptions, and termination	X	X	X
(iii) communication and call-outs	X	X	X
(iv) effective use of intercommunication system	X	X	X
(v) early identification of pilot incapacitation	X	X	X
(vi) debriefing	X	X	X
(6) Human performance and limitations, CRM: as per AMC1 ORO.FC.115	X	X	X
(7) Flight safety			
(i) general flight safety in helicopter operations			
(A) noise protection for crew members embarking/disembarking with running rotors		X	X
(B) the dangers to self and others of rotor running helicopters, including loading of patients		X	X
(C) effects of downwash on persons and objects		X	X
(D) dangers of main and tail rotors hitting objects on ground and in-flight		X	X
(E) safety at the HEMS operating site		X	X
(F) safety at other landing sites incl the HEMS operating base		X	X
(ii) obstacle and traffic clearance			
(A) importance of lookout for collision avoidance and associated call-outs			X
(B) sterile cockpit during critical phases of flight			X
(C) identification of obstacles and conflicting terrain			X
(iii) handling of abnormal and emergency situations including check-lists			
(A) necessary coordination procedures between flight and technical/other crew members including checklists as applicable	X	X	X
(B) early identification of pilot incapacitation	X	X	X
(C) emergency evacuation	X	X	X

(iv) dangerous goods (DGs), as relevant for HEMS operation (A) dangerous goods that might be in medical passangers' luggage including oxygen, if not part of the cabin design (B) awareness of dangerous goods that might be in patients' or other passengers' luggage, backpacks or clothes			X X
(8) security			
(i) The operator's security programme	X	X	X
(ii) HEMS operating sites and operating base	X	X	X

** applicable to trainees that have passed the theoretical knowledge examination for at least PPL(H) or that hold at least a PPL(H) licence.*

*** applicable to trainees that have passed the theoretical knowledge examination for at least PPL(A) or that hold at least a PPL(A) licence.*

(b) The operator may consider that trainees that have passed the theoretical knowledge examination for at least PPL(A) or PPL(H) or that hold at least a PPL(A) or PPL(H) licence do not require additional navigation training. In all other cases, if the HEMS technical crew member is tasked to provide assistance in navigation, the navigation training may be structured as follows :

(1) applicable parts of SERA, as relevant to the navigation tasks of the HEMS crew member

(2) Basic navigation training

(i) charts (convergence, scale, projections, symbology, plotting)

(ii) measuring distances and courses

(iii) ability to keep track with helicopter position on map

(iv) moving map if applicable

(v) identification of obstacles and conflicting terrain

(vi) time (local/UTC, sunrise/sunset) and speed

(vii) units and unit conversion

(3) navigation aid principles and use

(i) navigation equipment and AFCS operations as applicable

(ii) transponder

(iii) ACAS, HTAWS, weather radar, moving map as applicable

(iv) inadvertent IMC

(4) airspace, restricted areas, and noise-abatement procedures

(i) air traffic services

(ii) aerodrome procedures

(iii) AIP

(iv) NOTAMS

(5) crew coordination: assignment of navigation tasks

(c) The operator may consider that trainees that have passed the theoretical knowledge examination for at least PPL(A) or PPL(H) or that hold at least a PPL(A) or PPL(H) licence do not require additional navigation training. In all other cases, if the HEMS technical crew member is tasked to provide assistance in radio communications, the radio communications training may be structured as follows :

(1) operation of relevant radio equipment: radio licence as applicable to the frequencies used by the technical crew member

(2) crew coordination: effective use of radio communication system

(d) If the HEMS technical crew member is tasked to provide assistance in monitoring , the training towards monitoring may be adapted to the knowledge of the technical crew member and structured as shown in table 2.

Table 2 – HEMS technical crew member monitoring training

HEMS TECHNICAL CREW MEMBER MONITORING TRAINING **TRAINING TOPIC**	**Trainee with PPL(H)****	**Trainee with PPL(A)***	**Other Trainee**
(1) general knowledge of helicopter operations			
(i) general knowledge of helicopter structure, power plant, systems, instruments, and airworthiness		X	X
(ii) limitations, normal, and abnormal procedures including Category A certification, performance class 1, performance class 2, and performance class 3. as applicable	X	X	X
(2) monitoring function			
(i) assignment of cockpit tasks	X	X	X
(ii) parameters the HEMS crew member is tasked to monitor	X	X	X

(iii) flight path monitoring in the context of collision avoidance and, if applicable, navigation	X	X	X
(3) crew coordination			
(i) assignment of monitoring tasks	X	X	X
(ii) emphasis on call-outs and actions resulting from the monitoring process	X	X	X
(4) Handling of abnormal and emergency situations, as applicable			
(i) definition of warnings, cautions and advisories			X
(ii) identification of malfunctions (visual and aural)			X
(iii) selection of appropriate abnormal or emergency procedure in checklist			X
(iv) abnormal or emergency procedures checklist reading			X
(v) monitoring of critical actions (e.g. engine shutdown)			X
(vi) distress call and other means of emergency signaling			X

** applicable to trainees that have passed the theoretical knowledge examination for at least PPL(H) or that hold at least a PPL(H) licence.*

*** applicable to trainees that have passed the theoretical knowledge examination for at least PPL(A) or that hold at least a PPL(A) licence.*

(e) If the HEMS technical crew member is involved in flights under IFR, the additional training towards may be structured as follows:

(i) introduction to IFR operations covering IFR parts of operations manual, including MEL

(ii) applicable parts of SERA

(iii) human performance and limitations

(iv) navigation sources, charts, and procedures

(v) navigation equipment and AFCS operations as applicable

(vi) flight instrument systems

(vii) ACAS, HTAWS, weather radar, moving map as applicable

(viii) air traffic control

(ix) meteorology as relevant to the operating area

(x) flight planning

(f) If the HEMS technical crew member is tasked to provide assistance on the ground or is involved in operations under a specific approval, the training towards these tasks may be structured as in AMC2 .

55. The following GM2 SPA.HEMS.130(f)(1) is inserted:

GM2 SPA.HEMS.130(f)(1) Crew requirements

HEMS TECHNICAL CREW MEMBER OBSERVATION FLIGHTS

If the candidate HEMS crew member has no flight experience as technical crew member, flight crew member or student pilot in day VMC, night VMC or IMC, the operator may provide observation flights on HEMS missions in day/night VMC and IMC as relevant, prior to the helicopter/FSTD training, once the ground training and checking of the conversion course has been completed.

56. AMC1 SPA.HEMS.135(b) is amended as follows:

AMC1 SPA.HEMS.135(b) HEMS medical passenger and other personnel briefing

GROUND EMERGENCY SERVICE PERSONNEL

(a) The task of training large numbers of emergency service personnel is formidable. Wherever possible, helicopter operators should afford every assistance to those persons responsible for training emergency service personnel in HEMS support. This can be achieved by various means, such as, but not limited to, the production of flyers, publication of relevant information on the operator's web site, development of applications and provision of extracts from the operations manual.

[…]

57. The following GM1 SPA.HEMS.135(b) is inserted:

GM1 SPA.HEMS.135(b) HEMS medical passenger and other personnel briefing

GROUND EMERGENCY SERVICE PERSONNEL

(a) When covering the items in AMC1 SPA.HEMS.135(b), the following could be described:

(1) Definitions: List applicable definitions and abbreviations.

(2) Helicopter(s):

(i) A basic description of the type(s) of helicopter(s) in use and layout(s) such as doors for loading and offloading with text(s), figure(s) or photo(s); and

(ii) Describe hazardous areas with figure(s) or photo(s), emphasize dangers with respect to rotors and sloping terrain and carrying of patient(s) or item(s) under the rotor disc.

(3) Types, and selection, of HEMS operating sites as applicable to the operation:

(i) Describe different types of HEMS operating sites (for example roads, mountains, gardens, fields, mountain ledges, steep terrain, football fields, school yards, pre-surveyed sites, aerodromes);

(ii) Describe different types of advantages and disadvantages, hazards (for example weather and light conditions, the use of flashlights/searchlights, surface, dust, snow, fixed and loose obstacles, wires, downwash, open fires/fireplaces, traffic and bystanders), limitations and procedures associated with the different types of HEMS operating sites;

(iii) Describe challenges related to weather (temperature, wind, fog, low clouds, rain, snow) and light (night/non-NVIS/NVIS) conditions;

(iv) Describe HEMS operating site dimension(s) for the different type(s) of helicopter(s) with text(s), figure(s) or photo(s);

(v) Describe how to illuminate the HEMS operating site from the ground;

(vi) Describe light on skid/wheel;

(vii) Describe HHO or HEC with cargo sling;

(viii) Describe ground to helicopter signals;

(ix) Describe special hazards related to fire or chemical, biological, or radiological accidents and the importance of selecting a safe HEMS operating site(s) for the protection of both ground emergency services personnel and crew; and

(x) Describe communication between the ground emergency services personnel and helicopter during landing (radio communication or hand signals).

(b) The operator could make available a short checklist, covering for example the following items:

(1) Establish communication;

(2) Select operating site;

(3) Secure the operating site (public/bystanders/crowd control/obstacles/loose objects); and

(4) Communicate with the helicopter the position of/how to identify the operating site, weather, and hazards.

(c) It is advantageous if operators in the same operating area collaborate when developing checklists and when describing items covered in AMC1 SPA.HEMS.135(b).

58. AMC1 SPA.HEMS.140 is amended as follows:

AMC1 SPA.HEMS.140 Information, procedures and documentation

OPERATIONS MANUAL

The operations manual should include all of the following:

[…]

(g) the safety altitude for the area overflown; ~~and~~

(h) abnormal procedures including procedures to be followed in case of inadvertent entry into cloud~~.~~;

(i) operational dispatch criteria;

(j) a description of the crew composition for all phases of flight and conditions, standard operating procedures for the described crew composition including any procedures to ensure the continuity of the crew concept;

(k) flight crew and technical crew training and checking syllabi, as required by SPA.HEMS.130.

59. The following AMC2 SPA.HEMS.140 is inserted:

AMC2 SPA.HEMS.140 Information, procedures and documentation

HEMS RISK ASSESSMENT

The operator's HEMS risk assessment should take into account, but not be limited to, all of the following for both day and night operations:

(a) adequate ground reference;

(b) reliability of weather reporting facilities;

(c) crew composition, minimum crew qualification, initial and recurrent training;

(d) flight time limitations and crew fatigue

(e) operating procedures, including crew coordination;

(f) weather minima;

(g) equipment of the helicopter;

(h) additional considerations due to specific local conditions.

60. The following GM1 SPA.HEMS.140(b) is inserted:

GM1 SPA.HEMS.140(b) Information, procedures and documentation

HEMS TACTICAL RISK ASSESSMENT

The commander's HEMS tactical risk assessment may be included in the daily briefing and amended as necessary.

The following may be considered:

(a) operating environment, including airspace and local geography;

(b) weather;

(c) notams;

(d) performance;

(e) aircraft, equipment and defects, MEL, and medical equipment;

(f) fuel planning;

(g) crew fatigue, recency and qualifications;

(h) dispatch criteria;

(i) tasking, roles and responsibilities;

(j) in-flight replanning;

(k) for NVIS, the elements in GM4 SPA.NVIS.130(f); and

(l) relevant threats.

61. The following AMC1 SPA.HEMS.145(b) is inserted:

AMC1 SPA.HEMS.145(b) HEMS operating base facilities

FACILITIES FOR OBTAINING CURRENT AND FORECAST WEATHER INFORMATION AT OPERATING BASES THAT ARE INTENDED TO BE USED AT NIGHT

When a HEMS operating base that is intended to be used for night operations; the operator should have access to one of the following:

(a) meteorological information from a certified service provider at the operating base;

(b) meteorological information from a certified service provider at an aerodrome or location where the operator determines that local meteorological conditions are likely to be similar to that of the operating base on most nights; or

(c) supplemental weather information at the operating base, as described in point (e)(4) and (e)(9) of AMC1 CAT.OP.MPA.192.

62. The following AMC1 SPA.HEMS.151 is inserted:

AMC1 SPA.HEMS.151 Aircraft tracking system

GENERAL

(a) The operator should track and monitor HEMS flights from take-off to landing.

(b) The operator should establish a detailed procedure describing how the aircraft tracking system is to be monitored, and what actions and when are to be taken if a deviation or anomaly has been detected.

OPERATIONAL PROCEDURE

(c) The procedure should take into account the following aspects:

(1) the outcome of the risk assessment made when the frequency of position reports was defined;

(2) the local environment of the intended operations; and

(3) the interface with the operator's emergency response plan.

(d) Aircraft tracking data should be recorded on the ground and retained for at least 48 h. Following an accident or a serious incident subject to investigation, the data should be retained for at least 30 days, and the operator should be capable of providing a copy of this data without delay.