



# Notice of Proposed Amendment 2018-04

## Helicopter emergency medical services performance and public interest sites

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

### EXECUTIVE SUMMARY

The objective of this Notice of Proposed Amendment (NPA) is to contribute to the achievement of the overall objectives of the EASA system, which are defined in Article 2 of Regulation (EC) No 216/2008 (the Basic Regulation).

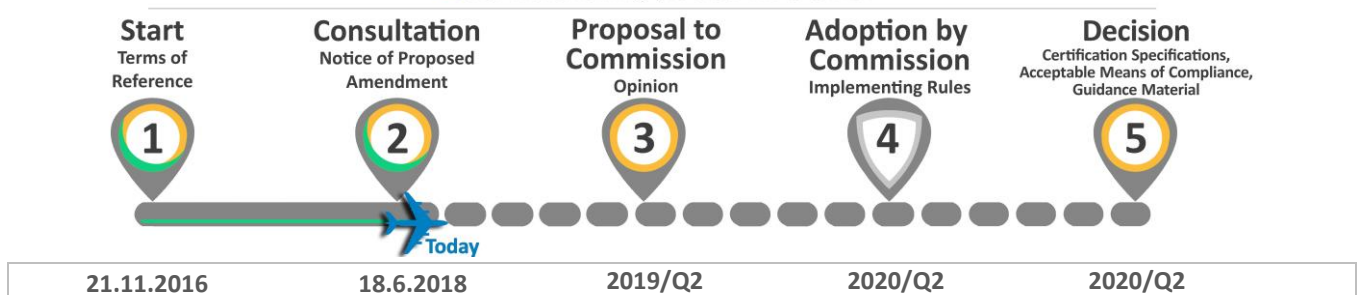
This NPA, therefore, proposes to:

- foster efficient and proportional rules, more precisely regarding:
  - HEMS requirements for high altitudes;
  - a new HEMS concept to cover mountain operations and rescue operations (other than search and rescue (SAR) operations);
- maintain a high aviation safety level by reviewing the requirements related to flights to/from public interest sites (PISs) located in congested areas; and
- maintain a high aviation safety level by reviewing the requirements related to HEMS flights by day or night, regarding equipment, training, minima, and operating/hospital site illumination.

The proposed draft amendments are expected to increase safety, improve harmonisation and ensure alignment with ICAO while keeping the economic impact for HEMS operators to a minimum.

<b>Action area:</b>	Helicopters		
<b>Affected rules:</b>	Part-SPA, Part-ARO, Part-ORO, Part-CAT and Annex I (Definitions) of Commission Regulation (EU) No 965/2012 (the Air OPS Regulation)		
<b>Affected stakeholders:</b>	Helicopter CAT and HEMS operators		
<b>Driver:</b>	Level playing field	<b>Rulemaking group:</b>	Yes
<b>Impact assessment:</b>	Light	<b>Rulemaking Procedure:</b>	Standard

• EASA rulemaking process milestones



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## 1. About this NPA

### 1.1. How this NPA was developed

The European Aviation Safety Agency (EASA) developed this NPA in line with the Basic Regulation and the Rulemaking Procedure<sup>1</sup>. This rulemaking activity is included in the EASA 5-year Rulemaking Programme<sup>2</sup> under rulemaking task RMT.0325 & RMT.0326 (OPS.057(a) and OPS.057(b)). The text of this NPA has been developed by EASA based on the input of the RMT.0325/0326 Rulemaking Group (RMG), on the comments received following the publication of the subsequent HEMS concept paper, and on a focused consultation. It is hereby submitted to all interested parties<sup>3</sup> for consultation.

### 1.2. How to comment on this NPA

Please submit your comments using the automated **Comment-Response Tool (CRT)** available at <https://hub.easa.europa.eu/crt/><sup>4</sup>.

Please submit your responses to the questions asked in the impact assessment part of this NPA by responding to the related EU Survey 'RIA questions for RMT.0325', which is available at:

[https://ec.europa.eu/eusurvey/runner/RMT0325\\_questions\\_for\\_NPA](https://ec.europa.eu/eusurvey/runner/RMT0325_questions_for_NPA)

The deadline for submission of comments is **18 September 2018**.

### 1.3. The next steps

Following the closing of the public commenting period, EASA will review all comments.

The outcome of the NPA public consultation will be reflected in a comment-response document (CRD).

Based on the comments received, EASA will develop an opinion containing the proposed amendments to Regulation (EU) No 965/2012 and will publish the CRD concurrently with the opinion.

The opinion will be submitted to the European Commission, which will use it as a technical basis in order to prepare an EU regulation.

Following the adoption of the regulation, EASA will issue a decision containing the related acceptable means of compliance (AMC)/guidance material (GM).

<sup>1</sup> EASA is bound to follow a structured rulemaking process as required by Article 52(1) of Regulation (EC) No 216/2008. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by EASA for the issuing of opinions, certification specifications and guidance material (<http://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-18-2015-rulemaking-procedure>).

<sup>2</sup> <http://easa.europa.eu/rulemaking/annual-programme-and-planning.php>

<sup>3</sup> In accordance with Article 52 of Regulation (EC) No 216/2008, and Articles 6(3) and 7) of the Rulemaking Procedure.

<sup>4</sup> In case of technical problems, please contact the CRT webmaster ([crt@easa.europa.eu](mailto:crt@easa.europa.eu)).



## 2. In summary — why and what

### 2.1. Why we need to change the rules — issue/rationale

Amendments to the Air OPS Regulation are needed to properly address the issues regarding HEMS operations stemming from stakeholder feedback, non-transposition of JAA material, and non-implementation of or deviation from the rules, including:

- helicopter performance, in particular performance in high mountains;
- public interest site (PIS) provisions;
- the safety level of helicopter emergency medical service (HEMS) flights, especially at night;
- the delegation of line maintenance tasks to the HEMS technical crew member.

#### **Exemptions<sup>5</sup> in accordance with Article 14 ‘Flexibility provisions’ of the Basic Regulation relevant to the scope of this RMT:**

The UK CAA issued Safety Directive (SD) No SD-14/003, introducing additional requirements to increase the safety of HEMS flights at night, as an immediate reaction to a safety problem in accordance with Article 14.1 of the Basic Regulation, has been reviewed.

#### **Alternative means of compliance (AltMoCs) relevant to the scope of this RMT:**

The Finnish AltMoC regarding the safety of single-pilot HEMS flights has been reviewed.

Three AltMoCs regarding the use of the cargo sling for mountain HEMS operations have been reviewed.

#### **ICAO and third-country references relevant to the scope of this RMT:**

The 2014 FAA amendment to FAR.135 regarding air ambulance operations has been reviewed, although no alignment was specifically sought.

#### **Operations to and from PISs**

Under JAR-OPS 3 of the JAA, it was established that many Member States (MSs) had encountered problems with fully applying the performance rules where helicopters were operated to some sites in the public interest and in particular for HEMS and air ambulance operations to some hospitals in congested hostile areas. Although MSs accepted that progress should be made towards operations where risks associated with a critical engine failure were eliminated, or limited by the exposure time

<sup>5</sup> Exemptions that have an impact on the development of this RMT’s content and that refer to:

- Article 14.1: Measures taken as an immediate reaction to a safety problem;
- Article 14.4: Exemptions from substantive requirements laid down in the Basic Regulation and its implementing rules in the event of unforeseen urgent operational circumstances or operational needs of a limited duration;
- Article 14.6: Derogation from the rule(s) implementing the Basic Regulation where an equivalent level of protection to that attained by the application of the said rules can be achieved by other means;
- Article 22.2(b): Individual flight time specification schemes deviating from the applicable certification specifications which ensure compliance with the essential requirements and, as appropriate, the related implementing rules.

concept<sup>6</sup>, a number of landing sites still exist that do not (or never can) allow operations to performance class (PC) 1 or 2 requirements as they should.

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 MSs could insist that such sites are not used — or only 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 rules for the use of such sites in hospital grounds for HEMS operations attract alleviation, it is only partial and will still impact upon present operations.

Due to the fact that such operations are performed in the public interest, it was felt at the time the rules were drafted that the relevant authority should be able to exercise its discretion so as to allow continued use of such sites provided that it is satisfied that an acceptable level of safety performance can be maintained — notwithstanding that the site does not allow operations to PC1 or PC2 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 time period.

The aim was to use the PIS provision only for hospital sites that could not be modified and could not be made compatible with the helicopter performance requirements. This should have restricted their use to a limited number of historical sites.

A hospital landing site is a take-off and landing site where the site dimensions and obstacle environment are known in advance. It is similar to an aerodrome in that respect. The differences between a hospital landing site and an aerodrome or heliport are that the features, dimensions, obstacle control and aeronautical information services (AIS) are not under the control of the helicopter operator, are not within the remit of EASA and, in some cases, are not under the control of the national aviation authority (NAA) either.

PISs are an operational solution to a wider problem. This operational solution has safety implications. The reduction in the safety level from normal CAT requirements is considered and accepted by MSs as long as there is a public interest to keep conducting essential helicopter operations to a particular hospital site.

New hospital landing sites should be designed with due regard to the helicopter performance requirements. This aim has not been achieved by the current set of rules: the operating rules should ensure that, in the long term, PC1 will be achievable at all or most of the hospital landing sites. The current rules do not achieve this goal and should therefore be amended.

### **Mountain operations and other than search and rescue (SAR) operations**

Regarding mountain operations, the current HEMS rules are not suited to mountain operations above 10 000-ft density altitude, but serve their purpose for low-altitude operations. One of the aims of this NPA is to ensure that HEMS rules are adapted to any kind of terrain, therefore negating the need for a separate definition of mountain operations. Currently, MSs are conducting mountain HEMS operations

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<sup>6</sup> 'Exposure time' means the actual period during which the performance of the helicopter with the critical engine inoperative in still air does not guarantee a safe forced landing or the safe continuation of the flight.

in different ways. Some are conducting them according to national rules, because they consider mountain HEMS operations as state or similar services falling outside the scope of the Basic Regulation. Other MSs are conducting them according to CAT and HEMS rules, and use a number of AltMoCs and multiple flexibility provisions to adapt the rules to mountainous environments.

Regarding other than SAR operations, where a person is endangered by the environment and, as far as can be assessed at the moment of initiating the rescue operation, not by a medical condition, are currently not covered by the HEMS rules. It should be noted that SAR operations are clearly not within the remit of EASA as they fall outside the scope of the Basic Regulation. ICAO defines SAR operations as follows:

- **search:** an operation, normally coordinated by a rescue coordination centre or rescue sub-centre, using available personnel and facilities to locate persons in distress.
- **rescue:** an operation to retrieve persons in distress, provide for their initial medical or other needs and deliver them to a place of safety.

It is an institutional service coordinated by rescue centres, mainly for the purpose of providing assistance to aircraft.

Some MSs apply national rules for other than SAR operations because they consider other than SAR operations to be state or similar services. Other MSs do not have national rules for other than SAR operations or include mountain HEMS and other than SAR operations in HEMS operations: in order to ensure the same level of assistance to people living in a town or to people undertaking activities or living in mountainous areas, some MSs do not distinguish between HEMS and other than SAR operations. Those MSs have a single HEMS concept of operations.

The resulting situation is the lack of a level playing field across European mountains, the duplication of effort in the design of flexibility provisions and development of national rules, and the lack of exchange of best practices.

The aim of this NPA is to enable MSs to include other than SAR operations into the HEMS concept of operations. In order to do this, special techniques and equipment that are needed for these operations (rescue hoist, hook, hovering disembark and embark) need to be introduced in the CAT HEMS regulatory framework.

### **Other than mountain HEMS operations**

HEMS operations involve higher levels of risk than pure CAT operations, since HEMS operations may have a direct impact on the patient's health or even their survival. Some MSs have argued that current rules do not make that industry sector safe enough. The available accident data supports the idea that HEMS operations at night or in marginal weather conditions can be improved.



### Safety risk assessment

A data analysis of the 26 major HEMS accidents that took place in Europe during the period 2005–2014 has been used. The conclusions were the following:

Accidents/major incidents	% of occurrences	% of fatalities and serious injuries	Related issue
Loss of visual reference	17 %	46 %	Mountain and other than mountain operations
Collision with obstacles during final approach or hover at the operating site	21 %	14 %	Mountain and other than mountain operations
Power-plant-related issues	8 %	16 %	Public interest sites and mountain operations
Other system failures	12 %	0 %	Not applicable
Other crew-related issues	23 %	20 %	Mountain and other than mountain operations
Other issues	19 %	4 %	Not applicable

The data available allows to identify the main risk factors in HEMS operations. However, the figures are too small to identify which options are best suited to prevent the recurrence of accidents. Moreover, the data set relates to the JAA times, and it was not feasible to identify which parts of the JAA material were effectively transposed into national rules when the various accidents took place (in the 2003–2014 period and in different MSs). For this reason, the analysis has to rely on expert judgement, including the analysis of the safety impacts of the options further in the text.

## 2.2. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 3. The specific objectives of this proposal are to:

- foster efficient and proportional rule, more precisely regarding:
  - HEMS requirements for high altitudes;
  - a new HEMS concept to cover mountain operations and rescue operations (other than SAR operations);
- maintain a high aviation safety level by reviewing the provisions related to flights to/from PISs located in congested areas; and
- maintain a high aviation safety level by reviewing the requirements related to HEMS flights by day or night, regarding equipment, training, minima, and operating/hospital site illumination.

## 2.3. How we want to achieve it — overview of the proposals

### 2.3.1. Public interest sites (PISs)

The term ‘public interest site’ (PIS) covers two different derogations from the helicopter performance requirements: the derogation in Article 6.6 of the Cover Regulation, and the derogation in point CAT.POL.H.225. Article 6.6 was introduced as a temporary, transitional arrangement to





accommodate differing actions by some MSs. The aim of the current proposal is to merge the two differing schemes of Article 6.6 and point CAT.POL.H.225 into a single one. The following principles have been established in order to merge the two schemes:

The merged PIS derogation should be defined in point CAT.POL.H.225, and the provisions in Article 6 should no longer be needed.

Sites that were legitimately granted PIS derogations under Article 6.6 should remain eligible to PIS derogations under new point CAT.POL.H.225.

Such sites belong to two categories:

- hospital landing sites that are eligible to the current CAT.POL.H.225 derogations (i.e. those sites that had been in use before 1.7.2002);
- hospital landing sites that have been operated for the first time between 1.7.2002 and 28.10.2014, and would have been eligible to the current CAT.POL.H.225 derogation, if they had been operated before 1.7.2002. The provisions of Article 6.6 are applicable only to existing sites. The Air OPS Regulation, which introduced Article 6.6, was published on 25.10.2012 and has been in force since 28.10.2014.

Any new hospital landing site that had not been in use before 28.10.2014 is expected to be designed with due considerations to the Air OPS helicopter performance rules. New hospital landing sites are not eligible to any derogation.

It appeared that Article 6.6 has not only been used for the continuation of use of existing sites, but also to bring new hospital landing sites into existence after 28.10.2014 and then to approve these 'newly existing sites' as PISs. This situation is assumed to have happened only in a couple of MSs. Such practice should not be possible and should be discontinued. Moreover, it should be made clear that new hospital landing sites that came into existence after 28.10.2014 are not eligible to a PIS derogation.

Article 6.6 should remain applicable until 31.7.2022 in case such hospital sites had been approved as PISs, and a disruption to the health services was unacceptable, and a transition period of up to 5 years was needed to render such sites compatible with the needs of the operators and the helicopter performance requirements applicable to them.

It is also reinforced that there will be no approvals of new PISs.

- If a hospital landing site is currently compatible with the helicopter performance requirements, the obstacle environment should be controlled in such a way that helicopter performance requirements are complied with, otherwise the helicopter operations should be discontinued.
- It is also expected that, if the current fleet of HEMS and air ambulance helicopters is capable of operating in compliance with the helicopter performance requirements and without a PIS exemption, the operators will not change their fleets in such a way that safety would be decreased over congested hostile areas. The increased risk to third parties should not be accepted.

The worsening of the obstacle environment at existing PISs should also be avoided.

- NAAs usually have no competency on building restrictions or the growth of trees outside aerodromes, where not covered by safeguarding arrangements.



- However, NAAs should monitor the obstacle environment at PISs through review of the operator's approvals. The current guidance material already foresees a national directory of PISs, where site dimensions and obstacle environment at PISs should be recorded.
- NAAs should be capable of monitoring any changes in the obstacle environment at a PIS by checking the amendments to the operator's operations manual and ensuring that operators amend their operations manuals as part of the oversight cycle. In order to mandate this, the NPA proposes to introduce an additional requirement for operators to ensure that PIS data in the operations manuals remains valid and that any change to this data is notified to the competent authority and the authority of the state of the PIS. This proposal does not preclude NAAs from developing their own obstacle-monitoring activities at hospital sites and heliports.
- If the obstacle environment has permanently changed in such a way that exposure time has significantly increased in certain wind conditions, NAAs should reassess and, if necessary, revoke the PIS approval for this site. In order to achieve this, the NPA proposes to introduce a new requirement in Part-ARO, and proposes to move the guidance on national directories of PISs to AMC.

Date on which 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 by 31.7.2022 together with Article 6.6 provisions

Helicopter hospital landing sites are typically not EASA-certified aerodromes. The following are outside the remit of the operational rules and outside the scope of the Basic Regulation:

- any aerodrome regulation regarding the obstacle environment at PISs;
- any aeronautical information service (AIS) requirements, such as obstacle charts at PISs;
- any rules regarding the confidentiality of obstacle data that has been collected by individual operators.

The NPA proposes that the obstacle monitoring activities performed by the NAA should be required only for the purpose of granting, maintaining and revoking PIS approvals. The proposal does not prevent NAAs from using the directory of PISs for other purposes (such as AIS), subject to national regulations or requirements.

It would be desirable for operators to reduce the burden associated with the evaluation of PC1 capability at every hospital site, and the burden associated with obtaining PIS approvals for each individual site. This would be especially useful when an operator is urgently requested to fly outside its usual territory. The following was considered:

The determination of the PC1 capability remains an operator task because it is type-specific and may depend on parameters such as cabin configuration and fuel load.

It is good practice for hospitals and/or MSs to chart the obstacle environment in the vicinity of hospital landing sites. It does help the operator to identify in advance at which sites it can operate in PC1 and at which other sites it can only operate with a prior PIS approval. However, this good practice should not be mandated through operational rules.

In those MSs where such practice is not in place, it is for the operators to pre-survey the obstacle environment at hospital sites in advance, define whether or not PC1 can be complied with, seek PIS approvals as needed and define site-specific contingency procedures. Operators have to coordinate with the medical needs of their clients, in order to know in advance to which hospital sites they may be requested to fly.

Since a number of hospital sites may remain PISs in the foreseeable future, it was considered important to keep minimum performance margins when operating to these sites. The required performance level of 8 % climb gradient in the first segment reflects ICAO Annex 14 Volume II in 'Table 4-3 'Dimensions and slopes of obstacle limitations surfaces' for PC2 and establishes a means of mitigating performance issues. This requirement is retained because it defines a proportionate mass penalty at PISs, thereby applying an additional performance margin to such operations.

The NPA proposes to amend the following in accordance with these principles:

- Article 6,
- point ARO.OPS.220,
- point CAT.POL.H.225, and
- create new AMC3 ARO.OPS.220.

### **2.3.2. Mountain operations and other than SAR rescue operations**

#### **2.3.2.1 Applicable regulations**

The aim of the current proposal is to adapt the existing HEMS rules to mountain operations and to other than SAR rescue operations. The intent is also for the MSs that wish to do so, to be able to adopt European rules without introducing national variations.

MSs that want to keep mountain HEMS and other than SAR rescue operations under national rules should also be able to use the Air OPS Regulation as a reference for the drafting of their rules.

Two kinds of operations have been identified as other than SAR operations, and are not currently included in the definition of HEMS:

- Operations where a person is at an imminent or anticipated future health risk from the environment and needs to be rescued or provided with supplies;
- Operations where persons (other than medical professionals), animals, or equipment (other than medical equipment) need to be transported to and/or from a HEMS operating site. The supply of avalanche rescue operations is a typical example of such operations.

Not only the nature of the flights performed as other than SAR rescue operations, but also the risks involved in such operations were assessed to be equivalent to the risks involved in HEMS operations. The latter is especially the case when a non-pre-surveyed operating site needs to be used under time



pressure. Therefore, it was finally decided that other than SAR rescue operations shall fall under the definition of a HEMS flight.

HEMS rules and alleviations are well suited to the complexity of mountain operations. For safety reasons, it is preferred to operate different phases of the same mission under the same regulatory framework with the same alleviations (search, the unknown condition of the people to be rescued, transportation of support teams of mountain rescuers, etc.).

This NPA proposes amendments to the definition of HEMS in Annex I (Definitions) to the Air OPS Regulation and in GM1 SPA.HEMS.100 in order to introduce the concept of rescue operations (other than SAR operations).

### 2.3.2.2 HEMS operations using the cargo hook and sling

A number of MSs already allow missions that require the use of the cargo hook and sling, under a HEMS approval, even though the current rules do not foresee this kind of operation. They have provided AltMoCs to their operators by setting a number of conditions for such operations and by referring to SPO.SPEC.HEC. This concept is considered valid and should be included in HEMS.

The use of the cargo hook and sling is accepted as an equivalent method to the use of the hoist, to conduct HEMS operations at locations where landing is not a safe option.

The risks associated to hoist and sling load operations are different. HEMS sling load operations are subject to risk assessments and specific standard operating procedures.

The use of the helicopter hoist allows the operator to conduct the mission more efficiently, as the helicopter doesn't always need to land at an intermediate landing site. The use of the hoist or the sling should be the operator's decision that doesn't need to be biased by regulations.

Using the hoist or the hook and sling both require the help of a technical crew member, but the skills needed are different. The NPA proposes to introduce the definition of the 'HEMS HEC technical crew member'. As the HEMS HEC crew member is needed when the HEMS crew member is not, the number of crew members need not be increased.

The NPA proposes to create and amend the following in order to enable the use of the cargo hook and sling for HEMS operations:

- create a new definition of 'HEMS HEC operations' in Annex I;
- amend the definition of 'technical crew member' in Annex I;
- amend the definition of a 'HEMS operating site' in Annex I;
- create new point SPA.HEMS.105;
- create new AMC1 SPA.HEMS.105.

### 2.3.2.3 Seating of the HEMS technical crew member

It is recognised that the HEMS technical crew member should be sitting at the front in order to assist the pilot to the best of their abilities. However, in the following cases, this should not be a requirement and the rules should be simplified:



- For HEMS operations with the use of the cargo hook and sling, the technical crew member is no longer needed in the front seat after the in-flight reconnaissance of the HEMS operating site and landing at a nearby intermediate landing site. Help is needed to deal with the sling and supervise the operation from inside or under the helicopter.
- For HEMS HHO operations, when it is reasonably likely that the hoist is going to be used, the HEMS HHO technical crew member can assist the pilot and check for obstacles from the HHO technical crew member's position in the cabin, and acts as the HHO operator.

After landing at the HEMS operating site, the technical crew member may remain on the ground and assist the medical team while the commander performs a refuelling flight.

After landing at the HEMS operating site, the technical crew member may remain on the ground to marshal the helicopter for repositioning purposes.

It is, therefore, proposed to use a more performance-based approach to the seating of the technical crew member by amending point SPA.HEMS.130 and creating new AMC1 SPA.HEMS.130(e).

#### 2.3.2.4 Oxygen requirements for mountain operations at high altitudes

Helicopters are unpressurised and are usually not equipped with a fixed oxygen installation. At high altitudes, oxygen supply is required by the Air OPS Regulation. Unlike aeroplanes, helicopters don't need to fly at high altitudes in the cruise phase. They only fly at high altitudes temporarily for the purpose of landing, taking off, hoisting and sling load operations in the mountains. The need for oxygen is lower, because of the shorter time periods spent at high altitudes, and also because the physiology of mountain crews tends to adapt to the lower oxygen partial pressure at higher altitudes.

The current helicopter CAT and HEMS oxygen rules are based on aeroplane rules and are deemed too restrictive for helicopter operations in mountainous areas. Three options are considered to enable high-altitude helicopter operations in the mountains:

Option 1: Ensure that portable oxygen bottles can be installed on board and used by pilots. This would mirror the AMC for aeroplane operations, which allows portable equipment as a means of compliance. It should also be applicable to helicopter CAT and HEMS operations. A number of helicopters with HEMS equipment installed already have airworthiness-approved oxygen bottles on board to provide life support to patients. Pilots should be able to use the oxygen from these bottles for high-altitude operations. The nasal cannula (flexible oxygen hoses bringing oxygen to the nostrils) is considered to be the preferred oxygen dispenser for HEMS operations. It allows the use of oxygen during the operation, when necessary, with minimum distraction to the pilot.

Option 2: Enable high-altitude HEMS operations without oxygen on the condition that sufficient mitigation measures are in place. The current rules for specialised operations in Part-SPO include mitigations for high-altitude flights between 13 000 and 16 000 ft for flight duration of up to 10 minutes. However, with regard to CAT HEMS operations,

- it is expected that 10 minutes is not enough to cover the duration of a HEMS mission at high altitudes; also, the safety standards for CAT and HEMS operations are higher than for SPO operations;
- for HEMS operations, the time duration without oxygen is therefore proposed to be extended to 30 minutes between 10 000 and 16 000 ft to cover the operational needs;



- new mitigations are proposed to be introduced, in addition to the ones in the SPO alleviation, such as a once-in-a-lifetime hypoxia training;
- the proposed oxygen alleviation deviates from CAT standards in a controlled manner; however, it is proposed not to be applicable for CAT operations (other than HEMS operations).

Option 3: Align the oxygen requirements for complex helicopters of the CAT and HEMS rules with the requirements for non-complex helicopter oxygen requirements when it is justified for operational reasons, because HEMS operations in mountainous areas do not vary significantly with the complexity of the helicopter. Therefore, HEMS operations with a maximum operating passenger seating configuration of six or less should be able to use the oxygen requirements that are in place for non-complex helicopters.

It is proposed to follow all three options. These options do not allow the pilot to plan a lengthy cruise above 10 000 ft.

The NPA, therefore, proposes a new AMC2 CAT.IDE.H.240 and amendments to SPA.HEMS.110, AMC1 SPA.HEMS.110(d), and GM1 ORO.GEN.130(b) in order to simplify oxygen rules that are applicable to helicopters that operate in mountain areas.

### 2.3.2.5 Helicopter performance requirements for mountain operations at high altitudes

The current generation of twin-engine helicopters that are used in HEMS operations are capable of operating in PC2 as high as 10 000 ft density altitude with a HEMS configuration and payload. But there are limited phases of flight at HEMS operating sites (during take-off, landing, hovering disembark, rescue hoist or sling operations) where it is not possible to comply with PC1 or PC2.

Above this altitude, the HEMS rules cannot be met and patients' lives remain to be saved.

Although the current HEMS rules may be partly responsible for the helicopter manufacturers' efforts to produce twin-engine helicopters with ever higher power margins, it is unlikely that the HEMS market above 10 000 ft will provide enough an incentive for manufacturers to go much further in this direction.

It is, therefore, proposed to adjust performance requirements to the reality of high-altitude operations, and enable the use of category A certified helicopters in PC3 above this altitude for HEMS operations.

PC3 operations over a hostile environment shall only be conducted when a HEMS operating site used for take-off, landing or HEMS HEC operations is located above 10 000 ft density altitude and with a helicopter certified in category A or equivalent, as determined by the Agency, in order to attract the same CAT HEMS alleviations at the HEMS operating site.

The use of category A or category A equivalent certified helicopters improves safety during the entire mission from the HEMS base to the HEMS operating site, not only in respect of risk of engine failure, but also thanks to system redundancy that is not available on category B certified helicopters. In addition, such helicopters are more suitable platforms for equipment such as helicopter terrain awareness and warning system (HTAWS), autopilot, flight director, IFR capabilities, etc., that are important mitigation measures to reduce the risk of loss of reference, collision with obstacles, and loss of control in flight. See also Section 2.3.3. below.



The NPA proposes the following new rules and amendments to existing rules and AMC in order to adapt HEMS performance requirements to high-altitude mountain operations, and to mountain-specific conditions:

- amend CAT.POL.H.420,
- amend SPA.HEMS.125,
- create new AMC1 SPA.HEMS.125(b)(4).

### 2.3.3. Other than mountain HEMS operations

The NPA proposes new requirements to improve the safety of HEMS operations, especially at night and in marginal weather conditions, for HEMS operations.

#### 2.3.3.1 Night vision imaging systems (NVIS)

NVIS, when properly used by appropriately trained crew members in a crew concept, is considered to greatly assist in maintaining situational awareness and in managing risks during night operations. HEMS without NVIS should be restricted to pre-surveyed operating sites, and to well-lit urban areas. The NPA proposes to amend SPA.HEMS.100, to create new AMC1 SPA.HEMS.110(b) and new GM1 SPA.HEMS.100(c) in order to mandate NVIS at night for HEMS operations to unsurveyed sites outside well-lit urban areas.

#### 2.3.3.2 Obstacle awareness and avoidance

Moving maps with own-ship position, terrain database and obstacle database are considered to be essential tools for situation awareness and obstacle avoidance. They are proposed to be mandated for HEMS operations. HTAWS would therefore meet the proposed requirements, but would not be the only available system to do so.

HTAWS provides terrain proximity warnings, and some models also provide obstacle proximity warnings, in addition to the above-mentioned features.

However, HTAWS warnings as defined in the current HTAWS standard are not considered to have a decisive role in terrain and obstacle avoidance. This is due to the amount of nuisance warnings that are being generated. HTAWS is, therefore, not proposed to be mandated for HEMS operations.

Taking into account that rulemaking task RMT.0708 'Controlled flight into terrain (CFIT) prevention with helicopter terrain avoidance warning systems (HTAWS)' will reconsider the requirements for HTAWS, moving maps and other situational awareness devices that will be available in the near future, it has been decided not to require certified equipment and accept an electronic flight bag (EFB) application.

The NPA proposes to amend SPA.HEMS.110(b) and to create new AMC1 SPA.HEMS.110(b) to improve the situational awareness of the pilots regarding the obstacle environment.

#### 2.3.3.3 Simplification of the HEMS operating minima

The NPA proposes to improve and simplify the current version of the HEMS VFR minima, as they are currently presented in SPA.HEMS.120.

By day, the NPA proposes the merging of the 499–400 and 399–300 ft cloud base categories for simplification purposes. It was simply not practical for visibility minima to vary every 100 ft.



The NPA proposes to no longer distinguish between single-pilot operations with technical crew members and two-pilot operations. The distinction was considered not to be adequate, especially when the technical crew member is sufficiently trained.

The NPA proposes to adapt the HEMS VFR weather minima, following the input of an expert group that assessed the conditions that experienced and lesser experienced pilots can safely fly into. On average, this leads to a reduction of the HEMS minima by day, and to a slight increase in the weather minima at night. At night, the visibility is increased from 2 500–3 000 to 3 000 m visibility with NVIS, and from 2 500–3 000 to 5 000 m visibility without NVIS. 5000 m visibility is actually higher than the visibility minimum that is sometimes accepted in special VFR (3 000 m), but this is justified since HEMS without NVIS is a more demanding operation than reaching an aerodrome in a control zone. Also, the 5 000 m visibility minimum is applicable in combination with a lower ceiling minimum (1 200 instead of 1 500 ft). When the ceiling is higher than 1 500 ft, the visibility minima can be reduced to 3 000 m. The aim is not to give operational credit to NVIS operations, but to allow reduced visibility in HEMS operations only if sufficient mitigation measures are in place. By day, the VFR minimum visibility is averaged out at 1 500 m for dispatch, starting from values of 1 000, 2 000 and 3 000 m. The reduced VFR minima for day and night can be applied in single-pilot operations provided the HEMS technical crew member receives sufficient training. The option for the commander to decide to continue a day flight if the visibility is temporarily reduced, but not below 800 m, is proposed to be kept.

The NPA proposes to replace ‘cloud base’ with ‘ceiling’ for night HEMS VFR minima. This is deemed useful in particular for weather conditions where FEW clouds would be present at known locations (coastline, hill tops) without interfering with the flight. In addition, the NPA proposes that dispatch conditions should be described in the operations manual. Therefore, operators should define precisely in which particular cases the cloud base may be lower than the minimum ceiling without increasing the risk.

The requirement to remain clear of clouds when flying VFR is unchanged.

The NPA proposes to amend SPA.HEMS.120 and CAT.POL.H.215, create new AMC1 SPA.HEMS.120(d), new GM2 SPA.HEMS.120 and new GM1 CAT.POL.H.215(a)(3) in order to simplify the HEMS VFR minima.

#### 2.3.3.4 Enabling HEMS operations under instrument flight rules (IFR)

HEMS operations can theoretically take place under IFR, but there are a number of restrictions in the Air OPS Regulation that do not make IFR a practical solution. IFR reverts back to Part-CAT as HEMS flights are always required to comply with it unless SPA.HEMS provides derogations.

Enabling HEMS operations under IFR often requires the ability to perform part of the flight in VFR and to make approaches to places other than established aerodromes or heliports. The use of point in space (PinS) approaches and departures to an initial departure fix (IDF) is therefore needed.

This NPA proposes reduced VFR minima for HEMS operations under IFR using PinS approaches and departures to an IDF, when the instrument chart instructs the pilot to ‘proceed VFR’.

Depending on the class of airspace and time of day, the ‘proceed VFR’ minima can mean anything from visibilities of 800 to 5 000 m. When the missed approach point (MAPt) of the PinS approach and the IDF are very close to the heliport or operating site, the VFR minima may be much higher than needed for the purpose of achieving a landing or a go-around, especially at night.





The NPA proposes to reduce and simplify the VFR minima for that case, in order to align the minimum visibility with that needed to complete the procedure.

*Note:* The following PinS approach enablers are already being addressed in separate rulemaking tasks, because their use will not be restricted to HEMS operations:

- conditions to comply with the requirements of CAT.OP.MPA.305 when flying an IFR approach to a location with no aviation weather observations: RMT.0379 ‘All-weather operations’ and RMT.0573 ‘Fuel procedures and planning’;
- provision of the QNH when flying an IFR approach to a location with no aviation weather observations, and when the approach chart doesn’t specify the procedure: RMT.0573 ‘Fuel procedures and planning’;
- dispatch conditions allowing helicopter IFR operations to take place with a single destination alternate, when flying an IFR approach to a location with no aviation weather forecasts: RMT.0573 ‘Fuel procedures and planning’; and
- the introduction of operating minima for helicopter PinS approaches into the Air OPS Regulation: RMT.0379 ‘All-weather operations.’

HEMS operations may also use aerodromes. Helicopter specialised operations (SPO) and helicopter offshore operations (HOFO) can operate IFR to an aerodrome without an alternate. The NPA proposes to also define the conditions for HEMS operations to operate IFR to an aerodrome without an alternate.

The NPA proposes to create new SPA.HEMS.122 and GM1 SPA.HEMS.122, to amend CAT.POL.H.215, to create new GM1 CAT.POL.H.215(a)(1) and (a)(2), and to create new AMC1 SPA.HEMS.120(c) in order to enable IFR operations for HEMS.

### 2.3.3.5 Mitigating the risk of loss of visual reference during flight

This NPA proposes to facilitate the use of IFR for HEMS operations. This is a first step towards mitigating the risk of loss of visual reference during the flight. However, most HEMS operations are expected to remain under visual flight rules (VFR). The loss of visual reference during a VFR flight remains one of the major contributors to fatal accidents in HEMS, which calls for the following amendments:

**Increased pilot experience with night HEMS operations:** Newly recruited HEMS pilots typically lack night flight experience. Unfortunately, helicopter night experience can mainly be gained by flying HEMS.

The minimum night experience required for HEMS is proposed to be marginally increased to take these factors into account.

**Improved IMC training for pilots that do not hold a current instrument rating:** The current recency requirement is deemed too insufficient to achieve sufficient pilot proficiency in dealing with a loss of visual references during a flight. The 30-minute instrument flight recency is proposed to be replaced by a structured training session with a minimum duration of 45 minutes and a number of training elements to be successfully covered during each session.

**Stabilisation platforms:** It is proposed to require helicopters to be equipped with a basic stability augmentation system or autopilot for single-pilot operations at night. Higher standards of automation



for single-pilot operations at night are desirable but may not be achievable at reasonable costs, whereas the proposal would be sufficiently helpful to the single pilot without excessive disruption to the current HEMS fleet. It is nonetheless expected that some operators will have to either retrofit their helicopters or undertake a fleet change. A sufficient time frame of 5 years following the date of application of the amending regulation is therefore necessary for the successful implementation of that new requirement.

The NPA proposes to amend SPA.HEMS.110(e), SPA.HEMS.130, and AMC1 SPA.HEMS.130(d), and to create new AMC1 SPA.HEMS.110(e) in order to mitigate the risk of loss of visual references during VFR flights.

### 2.3.3.6 HEMS crew member training and checking

The HEMS technical crew member is considered to be essential to the safety of single-pilot operations. Rules put emphasis on a crew cooperation concept that is currently not developed in the AMC that defines the primary tasks of the HEMS crew member or in the AMC that defines the training of the HEMS crew member.

Feedback from stakeholders shows that the HEMS crew member training and checking varies significantly among operators. Operators that provide the most advanced training programmes use line flying under supervision, for which amendments to ORO.TC should be introduced, while operators that provide the minimum training in accordance with AMC1 SPA.HEMS.130(f) barely comply with the objectives of the rules. Training is essential considering the variety of backgrounds of the HEMS crew members, some of which have no aviation knowledge when they are recruited.

The NPA, therefore, proposes to include the reading of checklists into the AMC that defines the primary tasks of the HEMS technical crew member, in accordance with the rules.

The NPA also proposes to completely restructure the training and checking of HEMS crew members, taking into account any prior aviation knowledge they might have, and to include the following into the training and checking programme:

- initial and recurrent training covering the primary tasks of the HEMS crew member;
- additional training and checking reflecting any additional tasks the HEMS crew member may be assigned, in addition to their primary tasks;
- conversion course ground training and checking when changing helicopter types;
- initial and recurrent aircraft/FSTD training;
- operator proficiency checks;
- line flying under supervision;
- line checks.

In addition, the NPA proposes to consider a HEMS crew member to be inexperienced until they have flown 50 HEMS missions following the completion of the initial conversion course. Once the 50 missions are flown, the HEMS crew member that changes helicopter types or operators would not be considered to be inexperienced.



The NPA, therefore, proposes to amend ORO.TC.110 and ORO.TC.130, to create new GM1 ORO.TC.105, to amend AMC1 SPA.HEMS.130(e) and AMC1 SPA.HEMS.130(f)(1), and to create new AMC2 SPA.HEMS.130(f)(1) in order to improve crew cooperation and HEMS crew member training and checking, and to improve the overall safety of HEMS single-pilot operations.

### 2.3.3.7 Other minor adjustments to the HEMS rules

The NPA proposes to introduce the following minor adjustments:

- illumination of the HEMS operating site to be better described;
- HEMS dispatch criteria to be included in the operations manual;
- introducing a HEMS tactical risk assessment that may be included in the daily briefing, and amended as necessary;
- means of observing and recording weather conditions at the HEMS operating base to be defined in an AMC;
- the current set of considerations for the operation of single-pilot night HEMS with a technical crew member is proposed to be extended to two-pilot operations, because these considerations address HEMS operating conditions in general and they remain valid regardless of the crew composition;
- the ‘aircraft tracking’ wording to be used consistently throughout the Air OPS Regulation;
- the part on the HEMS commander experience to be removed from the implementing rule and placed in AMC.

The NPA proposes to both amend and create the following, and to delete AMC1 SPA.HEMS.130(e)(2)(ii)(B) in order to achieve the above-mentioned minor improvements:

- amend SPA.HEMS.130(e)(3);
- amend SPA.HEMS.140;
- amend AMC1 SPA.HEMS.140;
- create new GM1 SPA.HEMS.140(a);
- create new GM1 SPA.HEMS.145(b);
- amend AMC1 SPA.HEMS.130(d).

## 2.4. What are the expected benefits and drawbacks of the proposals

The impact assessment supports the preferred options regarding PISs and the measures proposed to mitigate risks related to a degraded visual environment, because they bring important safety benefits.

The impact assessment also supports the preferred options regarding mountain operations.

It was also assessed that no maintenance privilege should be granted to the HEMS technical crew member.

For the full impact assessment of the alternative options, please refer to Chapter 4.



### 3. Proposed amendments and rationale in detail

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

- deleted text is ~~struck through~~;
- new or amended text is highlighted in grey;
- an ellipsis '[...]' indicates that the rest of the text is unchanged.

#### 3.1. Draft regulation (draft EASA opinion) — Cover Regulation

1. Article 6 is amended as follows:

##### Article 6

###### *Derogations*

[...]

6. Existing helicopter operations to/from a public interest site (PIS) may be conducted in derogation to CAT.POL.H.225 of Annex IV until 31.7.2022 whenever the size of the PIS, the obstacle environment or the helicopter does not permit compliance with the requirements for operation in performance class 1. Such operations shall be conducted under conditions determined by Member States. Member States shall notify the Commission and the Agency of the conditions being applied.

[...]

#### 3.2. Draft regulation (draft EASA opinion) — Annex I (Definitions)

2. The definition of 'HEMS HEC' is inserted as follows:

(xx) 'HEMS HEC' flight means a flight of a helicopter operating under a HEMS approval for the purpose of transferring persons as human external cargo.

3. The definition of 'technical crew member' is amended as follows:

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

4. The definition of 'HEMS flight' is amended as follows:

(61) 'HEMS flight' means a flight by a helicopter operating under a HEMS approval, where immediate and rapid transportation is essential and the purpose of which is either:

(a) to facilitate emergency medical assistance ~~where immediate and rapid transportation is essential~~ by carrying one or more of the following:

- (ai) medical personnel;
- (ii) medical supplies (equipment, blood, organs, drugs);
- (iii) ill or injured persons and other persons directly involved;

or

- (b) to perform any operation where either:
- (i) a person is at imminent or anticipated health risk from the environment and needs to be rescued or provided with supplies; or
  - (ii) persons, animals or equipment need to be transported to and from the HEMS operating site;

5. The definition of 'HEMS operating site' is amended as follows:

(63) 'HEMS operating site' means a site selected by the commander during a HEMS flight for helicopter hoist a HEMS HEC operation or a landing or a take-off;

### 3.3. Draft regulation (draft EASA opinion) — Part-ARO

1. ARO.OPS.220 is amended as follows:

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

- (a) Upon receiving an application for the issue of an approval or changes to it, the competent authority shall assess the application in accordance with point CAT.POL.H.225 and conduct any additional assessment of the operator as deemed necessary.
- (b) The approval referred to in CAT.POL.H.225 shall include a list of the public interest site(s) and helicopter type(s) specified by the operator to which the approval applies.
- (c) The list of public interest sites shall only include sites that were established as public interest sites before 1 July 2002, or sites that were established as public interest sites before 28 October 2014 and a derogation under Article 6.6 of this Regulation has been notified to the Commission and the Agency.
- (d) If changes to the obstacle environment at a public interest site are notified or discovered, the competent authority shall assess whether the approval remains valid. If changes further hinder performance class 1 operations on a permanent basis:
  - (1) the approval shall be revoked;
  - (2) the site will no longer qualify for a public interest site approval under CAT.POL.H.225 until the new obstacles are removed.
- (e) The competent authority shall not grant a new approval under CAT.POL.H.225 for a public interest site that was previously operated in performance class 1 following a change in the obstacle environment.

### 3.4. Draft acceptable means of compliance and guidance material to Part-ARO (draft EASA decision)

1. 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.
2. AMC3 ARO.OPS.220 is added as follows:

**AMC3 ARO.OPS.220 Approval of helicopter operations to or from a public interest site****DIRECTORY OF PUBLIC INTEREST SITES**

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

**3.5. Draft regulation (draft EASA opinion) — Part-ORO**

1. ORO.TC.110 is amended as follows:

**ORO.TC.110 Training and checking**

- (a) The operator shall establish a training programme in accordance with the applicable requirements of this Subpart to cover the duties and responsibilities to be performed by technical crew members.
- (b) Following the completion of initial, operator conversion, differences and recurrent training, and following familiarisation flights, each technical crew member shall undergo a check to demonstrate their proficiency in carrying out normal and emergency procedures.
- (c) Training and checking shall be conducted for each training course by personnel suitably qualified and experienced in the subject to be covered. The operator shall inform the competent authority about the personnel conducting the checks.
- (d) The checks that follow the operator conversion training and familiarisation flights shall take place prior to operating as a required technical crew member in HEMS, HHO or NVIS operations.

2. ORO.TC.130 is amended as follows:

**ORO.TC.130 Familiarisation flights**

~~Following completion of~~ If the operator conversion training doesn't include training in the aircraft/FSTD, ~~the operator conversion training,~~ each technical crew member shall undertake familiarisation flights, ~~prior to operating as a required technical crew member in HEMS, HHO or NVIS operations.~~



### 3.6. Draft acceptable means of compliance and guidance material to Part-ORO (draft EASA decision)

1. 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 Implementing 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 (SPA.HEMS) of Annex V-(SPA.HEMS);
- (2) to/from a public interest site where performance class 1 criteria cannot be met;
- (3) without an assured safe forced landing capability;
- (4) short excursions above 13 000 ft without using supplemental oxygen.

[...]

2. GM1 ORO.TC.105 is amended as follows:

#### **GM1 ORO.TC.105 Conditions for assignment to duties**

##### GENERAL

- (a) The technical crew member in HEMS, HHO or NVIS operations should undergo an initial medical examination or assessment and, if applicable, a reassessment before undertaking duties.
- (b) Any medical assessment or reassessment should be carried out according to best aero-medical practice by a medical practitioner who has sufficiently detailed knowledge of the applicant's medical history.
- (c) The operator should maintain a record of medical fitness for each technical crew member.
- (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;
- (e) A class 2 or LAPL medical certificate issued in accordance with Commission Regulation (EU) No 1178/2011<sup>7</sup> meets these requirements.

<sup>7</sup> OJ L 311, 25.11.2011, p. 1.

### 3.7. Draft regulation (draft EASA opinion) — Part-CAT

1. CAT.POL.H.215 is amended as follows:

**CAT.POL.H.215 En-route — critical engine inoperative**

- (a) The mass of the helicopter and flight path at all points along the route, with the critical engine inoperative and the meteorological conditions expected for the flight, shall permit compliance with (1), (2) or (3):
- (1) When it is intended that the flight will be conducted at any time out of sight of the surface, the mass of the helicopter permits a rate of climb of at least 50 ft/minute with the critical engine inoperative at an altitude of at least 300 m (1.000 ft), or 600 m (2.000 ft) in areas of mountainous terrain, above all **relevant** terrain and obstacles along the route ~~within 9,3km (5 NM) on either side of the intended track.~~
  - (2) When it is intended that the flight will be conducted without the surface in sight, the flight path permits the helicopter to continue flight from the cruising altitude to a height of 300 m (1.000 ft) above a landing site where a landing can be made in accordance with CAT.POL.H.220. The flight path clears vertically, by at least 300 m (1.000 ft) or 600 m (2.000 ft) in areas of mountainous terrain, all **relevant** terrain and obstacles along the route ~~within 9,3km (5 NM) on either side of the intended track.~~ Drift-down techniques may be used.
  - (3) When it is intended that the flight will be conducted in VMC with the surface in sight, the flight path permits the helicopter to continue flight from the cruising altitude to a height of 300 m (1.000 ft) above a landing site where a landing can be made in accordance with CAT.POL.H.220, without flying at any time below the appropriate minimum flight altitude. Obstacles shall be considered within a distance on either side of the route as specified for the purpose of determination of the minimum flight altitude in VFR. ~~within 900m need to be considered.~~
- (b) When showing compliance with (a)(2) or (a)(3), **all of the following shall apply:**
- (1) the critical engine is assumed to fail at the most critical point along the route;
  - (2) account is taken of the effects of winds on the flight path;
  - (3) fuel jettisoning is planned to take place only to an extent consistent with reaching the aerodrome or operating site with the required fuel reserves and using a safe procedure; **and**
  - (4) fuel jettisoning is not planned below 1.000 ft above terrain.
- ~~(c) The width margins of (a)(1) and (a)(2) shall be increased to 18,5 km (10 NM) if the navigational accuracy cannot be met for 95 % of the total flight time.~~

2. CAT.POL.H.225 is amended as follows:

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

- (a) Operations to/from a public interest site (PIS) may be conducted in performance class 2, without complying with CAT.POL.H.310(b) or CAT.POL.H.325(b), provided that all of the following ~~are complied with~~ **conditions are met:**





- (1) the site was established as a public interest site ~~the PIS was in use before 1 July 2002;~~ or the site was established as a public interest site before 28 October 2014 and a derogation under Article 6.6 of this Regulation had been notified to the Commission and the Agency;
  - (2) the size of the PIS or obstacle environment does not permit compliance with the requirements for operation in performance class 1;
  - (3) the operation is conducted with a helicopter with an MOPSC of six or less;
  - (4) the operator complies with CAT.POL.H.305(b)(2) and (b)(3); ~~and~~
  - (5) the helicopter mass does not exceed the maximum mass specified in the AFM for a climb gradient of 8 % in still air at the appropriate take-off safety speed (V TOSS) with the critical engine inoperative and the remaining engines operating at an appropriate power rating;
  - (6) the operator has obtained prior approval for the operation from the competent authority; ~~Before such operations take place in another Member State, the operator shall obtain an endorsement from the competent authority of that State.~~
- (b) Site-specific procedures shall be established in the operations manual to minimise the period during which there would be danger to helicopter occupants and persons on the surface in the event of an engine failure during take-off and landing.
  - (c) The operations manual shall contain all of the following for each PIS: a diagram or annotated photograph, showing the main aspects, the dimensions, the non-conformance with the requirements performance class 1 requirements, the main hazards and the contingency plan should an incident occur.
  - (d) The information provided in (c) shall remain valid and any change to it shall be notified to the competent authority. When operations take place in another Member State, the operator shall also notify the authority of that State.

3. CAT.POL.H.420 is amended as follows:

**CAT.POL.H.420 Helicopter operations over a hostile environment located outside a congested area**

- (a) Operations over a non-congested hostile environment without a safe forced landing capability with turbine-powered helicopters with an MOPSC of six or less shall only be conducted if the operator has been granted an approval by the competent authority, following a safety risk assessment performed by the operator. Before such operations take place in another Member State, the operator shall obtain an endorsement from the competent authority of that State.
- (b) To obtain and maintain such approval, the operator shall:
  - (1) only conduct these operations in the areas and under the conditions specified in the approval;
  - ~~(2) not conduct these operations under a HEMS approval;~~
  - ~~(3)~~ substantiate that helicopter limitations, or other justifiable considerations, preclude the use of the appropriate performance criteria; and
  - ~~(4)~~ be approved in accordance with point CAT.POL.H.305(b).
- (c) By way of derogation from point CAT.IDE.H.240, such operations may be conducted without supplemental oxygen equipment, provided the cabin altitude does not exceed 10.000 ft for a period in excess of 30 minutes and 13.000 ft pressure altitude.

### 3.8. Draft acceptable means of compliance and guidance material to Part-CAT (draft EASA decision)

1. AMC1.CAT.POL.H.215(a)(1) and (a)(2) is added as follows:

#### **AMC1 CAT.POL.H.215(a)(1) and (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 in 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.

2. GM1.CAT.POL.H.215(a)(3) is added as follows:

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

##### RELEVANT TERRAIN AND OBSTACLES IN VFR

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

- (a) for day VFR, the distances specified in SERA.5005(f);
- (b) for night VFR, the distances specified in SERA.5005(c), or as approved by the competent authority;
- (c) for night VFR in HEMS, the distances specified in SPA.HEMS.120(d).

The helicopter speed should be reduced accordingly.

3. 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

The original Joint Aviation Authorities (JAA) Appendix 1 to JAR-OPS 3.005(i) was introduced in January 2002 to address problems that had been encountered by Member States at hospital sites due to the applicable performance requirements of JAR-OPS 3 Subparts G and H. These problems were enumerated in ACJ to Appendix 1 to JAR-OPS 3.005(d) paragraph 8, part of which is reproduced below.

##### *'8 Problems with hospital sites*

*During implementation of JAR-OPS 3, it was established that a number of States had encountered problems with the impact of performance rules where helicopters were operated for HEMS. Although States accept that progress should be made towards operations where risks associated with a critical power unit failure are eliminated, or*

limited by the exposure time concept, a number of landing sites exist which do not (or never can) allow operations to performance class 1 or 2 requirements.

These sites are generally found in a congested hostile environment:

- in the grounds of hospitals; or
- on hospital buildings;

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

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

Because such operations are performed in the public interest, it was felt that the Authority should be able to exercise its discretion so as to allow continued use of such sites provided that it is satisfied that an adequate level of safety can be maintained - notwithstanding that the site does not allow operations to performance class 1 or 2 standards. However, it is in the interest of continuing improvements in safety that the alleviation of such operations be constrained to existing sites, and for a limited period.'

As stated in this ACJ and embodied in the text of the appendix, the solution was short-term (until 31 December 2004). During the commenting period of JAA NPA 18, representations were made to the JAA that the alleviation should be extended to 2009. The review committee, in not accepting this request, had in mind that this was a short-term solution to address an immediate problem, and a permanent solution should be sought.

[...]

(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 2022.
- (2) No mandatory phase-out is foreseen for approved sites that were established as public interest sites before 28 October 2014.
- (3) 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.
- (4) 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).
- (5) As of the 'date of entry into force of this amendment' the obstacle environment at approved public interest sites should be kept under check in order to avoid performance class 1 operations to be further hindered, 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 by 31.7.2022.

(6) 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 Dimensions and slopes of obstacle limitations surfaces' for performance class 2. It was established as a means of mitigating performance issues. This requirement is retained as it defines a proportionate mass penalty at such sites, thereby applying an additional performance margin to such operations.

(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.

(A1) 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.

(B2) Solution with relation to (c)(2): as in (c)(1) above.

(C3) 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.

4. AMC2 CAT.IDE.H.240 is added as follows:

#### **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 should be approved in accordance with Commission Regulation (EU) No 748/2012 and may consist in a nasal oxygen cannula.

### 3.9. Draft regulation (draft EASA opinion) — Part-SPA

1. SPA.HEMS.100 is amended as follows:

**SPA.HEMS.100 Helicopter emergency medical service (HEMS) operations**

- (a) Helicopters shall only be operated for the purpose of HEMS operations if the operator has been approved by the competent authority.
- (b) To obtain such approval by the competent authority, the operator shall:
  - (1) operate in CAT and hold a CAT AOC in accordance with Annex III (Part-ORO);
  - (2) demonstrate to the competent authority compliance with the requirements contained in this Subpart.
- (c) Night operations to non-pre-surveyed HEMS operating sites outside congested areas with cultural lighting shall be conducted under an approval in accordance with SPA.NVIS.100.

2. SPA.HEMS.105 is inserted as follows:

**SPA.HEMS.105 HEMS HEC operations**

- (a) HEMS HEC operations may be conducted either with the helicopter hoist under SPA.HHO, or as described in (b) below with the cargo sling.
- (b) When not conducted under SPA.HHO, all of the following shall apply:
  - (1) SPO.SPEC.HEC.105 'Specific HEC equipment' shall be complied with;
  - (2) a double cargo hook shall be used;
  - (3) operations shall be limited to the technical phase of the flight for rescuing injured, ill or endangered persons, or to carry persons that are necessary for the mission;
  - (4) HEC technical crew members shall be equipped, trained and briefed;
  - (5) HEMS HEC specific SOPs shall be developed according to a risk assessment conducted by the operator;
  - (6) a flight crew member involved in HEMS HEC operations shall be experienced, trained and checked for HEMS HEC operations.

3. SPA.HEMS.110 is amended as follows:

**SPA.HEMS.110 Equipment requirements for HEMS operations**

- (a) The installation of all helicopter dedicated medical equipment and any subsequent modifications and, where appropriate, its operation shall be approved in accordance with Regulation (EU) No 748/2012.
- (b) For night flights, the helicopter shall be equipped with a device providing a moving map display, own-ship position, and obstacles. The map and obstacle database shall be kept up to date.
- (c) By way of derogation from CAT.IDE.H.240, complex helicopters operated in HEMS with a MOPSC of nine or less shall comply with the oxygen requirements that are applicable to non-complex helicopters.
- (d) By way of derogation from CAT.OP.MPA.285 and CAT.IDE.H.240, short excursions above 13 000 ft without using supplemental oxygen may be undertaken, subject to prior approval of the competent authority based on all of the following conditions:

- (1) the excursion above 13 000 ft is necessary for the embarking/disembarking of persons or for HEMS HEC operations;
  - (2) the flight is not conducted above 16 000 ft;
  - (3) the duration of the excursion above 10 000 ft without oxygen is limited to 30 minutes within a HEMS mission;
  - (4) the safety briefing in accordance with CAT.OP.MPA.170 includes adequate information to crew members and passengers on the effects of hypoxia;
  - (5) SOPs are included in the operations manual covering (1), (2), (3) and (4) above;
  - (6) the prior experience of the operator in conducting operations above 13 000 ft without using supplemental oxygen;
  - (7) the individual experience of crew members and their physiological adaptation to high altitudes;
  - (8) the altitude of the HEMS operating base;
  - (9) hypoxia training for all pilots involved;
  - (10) the absence of a medical condition that could lead to hypoxia, for the pilots involved.
- (e) For single-pilot operations at night, the helicopter shall be equipped, within 5 years following the date of publication of the amending regulation, with a suitable stability augmentation system or autopilot.
- (f) For HEMS operations by day, the helicopter shall be equipped with the flight instruments required under CAT.IDE.H.130(a)(4), (a)(6) and (a)(7).

4. SPA.HEMS.120 is amended as follows:

**SPA.HEMS.120 HEMS operating minima**

- (a) HEMS flights operated under VFR in performance class 1 and 2 shall comply with the HEMS specific the weather minima in Table 1 for dispatch and en-route phase of the HEMS flight.
- (b) In the event that during the en-route phase the weather conditions fall below the cloud base or visibility minima shown, helicopters certified for flights only under VMC shall abandon the flight or return to base. Helicopters equipped and certified for instrument meteorological conditions (IMC) operations may abandon the flight, return to base or convert in all respects to a flight conducted under instrument flight rules (IFR), provided the flight crew are suitably qualified.

<b>Table 1</b>			
<b>HEMS operating minima</b>			
<b>2 PILOTS</b>		<b>1 PILOT</b>	
<b>DAY</b>			
<b>Ceiling</b>	<b>Visibility</b>	<b>Ceiling</b>	<b>Visibility</b>
500 ft and above	As defined by the applicable airspace VFR minima	500 ft and above	As defined by the applicable airspace VFR minima
499—400 ft	1000 m <sup>(2)</sup>	499—400 ft	2 000 m
<b>2 PILOTS</b>		<b>1 PILOT</b>	
399—300 ft	2 000 m	399—300 ft	3 000 m
<b>NIGHT</b>			

Cloud base	Visibility	Cloud base	Visibility
1 200 ft <sup>(**)</sup>	2 500 m	1 200 ft <sup>(**)</sup>	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 any obstacles in time to avoid a collision.~~

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

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

(c) For single-pilot operations, the ceiling and visibility minima defined in point SERA.5005 shall apply unless the technical crew member is seated in the front seat and is suitably qualified.

5. SPA.HEMS.122 is inserted as follows:

**SPA.HEMS.122 Destination alternate aerodromes**

By way of derogation from CAT.OP.MPA.181, the commander may decide not to specify a destination alternate aerodrome in the operational flight plan, if all of the following conditions are met:

- (a) the flight is operated under IFR;
- (b) the available current meteorological information indicates that the following meteorological conditions at the destination aerodrome will exist from 2 hours before to 2 hours after the estimated time of arrival, or from the actual time of departure to 2 hours after the estimated time of arrival, whichever is the shorter period, and
  - (1) a cloud base of at least 120 m (400 ft) above the minimum associated with the instrument approach procedure; and
  - (2) visibility of at least 1 500 m more than the minimum associated with the procedure;
- (c) two published instrument approaches with independent navigation aids are available at the aerodrome of intended landing;
- (d) fuel planning is based upon the approach procedure that requires most fuel.

6. SPA.HEMS.125 is amended as follows:

**SPA.HEMS.125 Performance requirements for HEMS operations**

- (a) Performance class 3 operations ~~shall not be conducted~~ over a hostile environment shall only be conducted when a HEMS operating site used for take-off, landing or HEMS HEC operations is located above 10 000 ft density altitude and with a helicopter certified as Category A or equivalent as determined by the Agency.
- (b) By way of derogation from CAT.POL.H.400(d)(2), night operations may be conducted in performance class 3 under the conditions defined in (a) above.
- (~~b~~c) Take-off and landing
  - (1) Helicopters conducting operations to/from a final approach and take-off area (FATO) at a hospital that is located in a congested hostile environment and that is used as a HEMS operating base shall be operated in accordance with performance class 1.

- (2) Helicopters conducting operations to/from a FATO at a hospital that is located in a congested hostile environment and that is not a HEMS operating base shall be operated in accordance with performance class 1, except when the operator holds an approval in accordance with CAT.POL.H.225.
- (3) ~~Unless performance class 3 criteria can be used in accordance with (a) above, helicopters~~ Helicopters conducting operations to/from a HEMS operating site located in a hostile environment shall be operated in accordance with performance class 2 and be exempt from the approval required by CAT.POL.H.305(a), provided compliance is shown with CAT.POL.H.305(b)(2) and (b)(3).
- (4) The HEMS operating site shall be big enough to provide adequate clearance from all obstructions. For night operations, the site shall be illuminated to enable the site and any obstructions to be identified.

7. SPA.HEMS.130 is amended as follows:

**SPA.HEMS.130 Crew requirements**

- (a) *Selection.* The operator shall establish criteria for the selection of flight crew members for the HEMS task, taking ~~prior~~ previous experience into account.
- ~~(b) *Experience.* The minimum experience level for the commander conducting HEMS flights shall not be less than:~~
  - ~~(1) either:~~
    - ~~(i) 1.000 hours as pilot in command/commander of aircraft of which 500 hours are as pilot in command/commander on helicopters; or~~
    - ~~(ii) 1.000 hours as co-pilot in HEMS operations of which 500 hours are as pilot in command under supervision and 100 hours pilot in command/commander of helicopters;~~
  - ~~(2) 500 hours' operating experience in helicopters, gained in an operational environment similar to the intended operation; and~~
  - ~~(3) for pilots engaged in night operations, 20 hours of VMC at night as pilot in command/commander.~~
- ~~(be) *Operational training.* Successful completion of operational training in accordance with the HEMS procedures contained in the operations manual.~~
- ~~(cd) *Recency/Instrument flight training.* All pilots Pilots conducting HEMS operations without a valid instrument rating shall have completed/complete a minimum of 30 minutes' flight training by sole reference to instruments in a helicopter or in an FSTD within the last six months.~~
- ~~(de) *Crew composition*~~
  - (1) *Day flight.* The minimum crew by day shall be one pilot and one HEMS technical crew member.
    - (i) This may be reduced to one pilot only if one of the situations below occur:
      - (A) at a HEMS operating site the commander is required to fetch additional medical supplies, refuel, or reposition. In such case, the HEMS technical crew member may be left to give assistance to ill or injured persons while the commander undertakes this flight;



- (B) after arriving at the HEMS operating site, the installation of the stretcher precludes the HEMS technical crew member from occupying the front seat;  
or
- (C) the medical passenger requires the assistance of the HEMS technical crew member in flight;
- (D) conducting HEMS HEC operations with the cargo sling.
- (ii) In the cases described in (i), the operational minima shall be as defined by the applicable airspace requirements; the HEMS operating minima contained in Table 1 of SPA.HEMS.120 shall not be used.
- ~~(iii) Only in the case described in (i)(A) may the commander land at a HEMS operating site without the technical crew member assisting from the front seat.~~
- (2) *Night flight.* The minimum crew by night shall be:
  - (i) two pilots; or
  - (ii) one pilot and one HEMS technical crew member in specific geographical areas defined by the operator in the operations manual; or
  - (iii) one pilot, if the medical passenger requires the assistance of the HEMS technical crew member during the flight from the HEMS operating site to the hospital.
- (3) All of the following shall be taken into account the following for both day and night operations:
  - (A) adequate ground reference;
  - (B) flight following system aircraft tracking for the duration of the HEMS mission;
  - (C) reliability of weather reporting facilities;
  - (D) HEMS minimum equipment list;
  - (E) continuity of a crew concept;
  - (F) minimum crew qualification, initial and recurrent training;
  - (G) operating procedures, including crew coordination;
  - (H) weather minima;
  - (I) additional considerations due to specific local conditions.
- (ef) Flight and technical crew training and checking
  - (1) Training and checking shall be conducted in accordance with a detailed syllabus approved by the competent authority and included in the operations manual.
  - (2) Crew members
    - (i) Crew training programmes shall: improve knowledge of the HEMS working environment and equipment; improve crew coordination; and include measures to minimise the risks associated with en-route transit in low-visibility conditions, selection of HEMS operating sites and approach and departure profiles.
    - (ii) The measures referred to in (f)(2)(i) shall be assessed during both of the following:
      - (A) VMC day proficiency checks, or VMC night proficiency checks when night HEMS operations are undertaken by the operator;

(B) line checks.

8. SPA.HEMS.140 is amended as follows:

**SPA.HEMS.140 Information and documentation**

- (a) The operator shall ensure that, as part of its risk analysis and management process, risks associated with the HEMS environment are minimised by specifying in the operations manual: selection, composition and training of crews; levels of equipment and dispatch criteria; and operating procedures and minima, including a HEMS tactical risk assessment, such that normal and likely abnormal operations are described and adequately mitigated.
- (b) Relevant extracts from the operations manual shall be made available to the organisation for which the HEMS are being provided.

**3.10. Draft acceptable means of compliance and guidance material to Part-SPA (draft EASA decision)**

1. 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.

Crisis situations are not HEMS. They can affect a large number of people at the same time. Such operations are conducted under national regulations and are therefore not discussed.

(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 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<sup>8</sup> 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

<sup>8</sup> Reason, J. (1997). *Managing the Risks of Organizational Accidents*. Farnham: Ashgate.

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  $5 \times 10^{-8}$  (in the case of elevated final approach and take-off areas (elevated FATOs) at hospitals in a 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 – providing 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

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 10 000 ft density altitude and with a helicopter certified as category A or equivalent as defined by the Agency, in order to attract the same CAT HEMS alleviations at the HEMS operating site.



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. Moreover, such helicopters are more suitable for equipment such as HTAWS, autopilot, flight director, IFR capabilities, etc., that are important mitigations measures to reduce the risk of loss of reference, collision with obstacles, and loss of control in flight.

(de) 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 ambulance has been taken by the medical professional, the commander makes an operational judgement over the conduct of the flight.

Simplistically, the above type of air ambulance operations could be conducted by any operator holding an 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.

(ef) 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.

(fg) 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.
- (34) 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.

(gh) 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.

(hi)

[...]

2. GM1 SPA.HEMS.100(c) is added as follows:**GM1 SPA.HEMS.100(c)****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.

3. AMC1 SPA.HEMS.105 is added as follows:**AMC1 SPA.HEMS.105 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 HEC technical crew member is a person tasked with any task defined in (a) above.
- (c) The operator should nominate a person trained in accordance with ORO.GEN.110 to ensure that persons who cannot be trained to secure themselves to the rope, are properly secured. This person may be an HEC technical crew member.



- (d) The HEC 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.
- (e) The HEC technical crew member may be the HEMS technical crew member if both the training and checking requirements of the HEMS technical crew members and HEC technical crew members are met.
- (f) A pilot involved in HEMS HEC operations should be trained and experienced as defined in paragraphs (b) and (d) of AMC1 SPO.SPEC.HEC.100.
- (g) A pilot involved in HEMS HEC operations should complete a flight check at least every 2 years to demonstrate competence in carrying out HEMS HEC operations. The checking may be combined with the line check or with a HEC training flight.
- (h) HEMS HEC standard operating procedures (SOPs) should be developed in accordance with paragraphs (g) and (h) of AMC1 SPO.SPEC.HEC.100.

4. AMC1 SPA.HEMS.110(b) is added as follows:

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

**MOVING MAP DISPLAYS**

A moving map display may be any of the following:

- (a) an HTAWS;
- (b) a display integrated in the cockpit environment;
- (c) an EFB software application.

5. AMC1 SPA.HEMS.110(d) is added as follows:

**AMC1 SPA.HEMS.110(d) 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.

6. AMC1 SPA.HEMS.110(e) is added as follows:

**AMC1 SPA.HEMS.110(e) 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 hold;
- (b) roll rate damping and attitude hold; and
- (c) yaw damping.

7. AMC1 SPA.HEMS.120(a) is added as follows:

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



## HEMS VFR MINIMA: CEILING AND VISIBILITY

<b>Table 1</b>			
<b>HEMS operating minima</b>			
<b>DAY</b>			
<b>Ceiling</b>		<b>Visibility</b>	
500 ft and above		As defined by the applicable airspace VFR minima (*)	
499–300 ft		1 500 m (*)	
<b>NIGHT</b>			
<b>NVIS</b>		<b>No NVIS</b>	
<b>Ceiling</b>	<b>Visibility</b>	<b>Ceiling</b>	<b>Visibility</b>
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 cloud base may be reduced to 1 000 ft for short periods.

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

- (a) 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.

<b>Table 2</b>		
<b>Reduced HEMS operating minima</b>		
<b>when instructed to 'proceed VFR' following an instrument approach</b>		
x is the distance between the missed approach point (MAPt) and the heliport or operating site		
<b>x</b>	<b>Visibility</b>	<b>Ceiling</b>
$x < 1\,000\text{ m}$	1 000 m	MDH
$1\,000\text{ m} \leq x \leq 3\,000\text{ m}$	x	MDH
$3\,001\text{ m} \leq x \leq 5\,000\text{ m}$	3 000 m	MDH



<b>Table 3</b>		
<b>Reduced HEMS operating minima when instructed to 'proceed VFR' prior to an IFR departure</b>		
x is the distance between the heliport or operating site and the initial departure fix (IDF)		
x	Visibility	Ceiling
x < 1 500 m	x	Crossing height at IDF
1 500 m ≤ x ≤ 3 000 m	3 000 m by night 1 500 m by day	Crossing height at IDF

**HEMS VFR MINIMA: DISTANCE TO OBSTACLES**

- (a) Except when necessary for take-off or landing, a HEMS flight in VFR shall only be performed:
- (1) over the congested areas of cities, towns or settlements or over an open-air assembly of persons at a height equal to or above 300 m (1 000 ft) above the highest obstacle within a radius of 600 m from the aircraft;
  - (2) elsewhere than as specified in (1), at a height equal to or above 300 ft above the ground or water, or 300 ft above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.
- (b) Except when necessary for take-off or landing, a HEMS VFR flight at night shall be flown at a level which is equal to or above the following:
- (1) 300 m (1 000 ft) above the highest obstacle within a radius of 600 m from the aircraft when flying over the congested areas of cities, towns or settlements or over an open-air assembly of persons; and
  - (2) elsewhere than as specified in (1), 150 m (500 ft) above the ground or water, or 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.

8. AMC1 SPA.HEMS.120(d) is added as follows:**AMC1 SPA.HEMS.120(d) HEMS operating minima****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, as defined in AMC2 SPA.HEMS.130(f)(1):

- (a) training for the primary tasks of the technical crew member;
- (b) navigation training;
- (c) communications training;
- (d) monitoring training.

9. GM2 SPA.HEMS.120 is added as follows:**GM2 SPA.HEMS.120 HEMS operating minima****HEMS TRAINING MINIMA**

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



10. GM1 SPA.HEMS.122 is added as follows:

**GM1 SPA.HEMS.122 Destination alternate aerodromes**

APPLICABLE WEATHER MINIMA

The operator may add the 400 ft/1 500 m increment to the lowest minima available to it at destination, in order to determine the need for a destination alternate.

11. AMC1 SPA.HEMS.125(b)(4) is amended as follows:

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

HEMS OPERATING SITE DIMENSIONS

- (a) When selecting a HEMS operating site, it should be of sufficient size, shape and clear of obstacles to provide for safe operations ~~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.~~
- ~~(b) For night operations, the illumination may be either from the ground or from the helicopter.~~
- (c) For night operations without NVIS, the pre-surveyed HEMS operating site dimensions should be at least 2 x D (the largest dimensions of the helicopter when the rotors are turning).

12. GM2 SPA.HEMS.125(b)(3) is added as follows:

**GM2 SPA.HEMS.125(b)(3)**

USE OF HEMS OPERATING SITES FOR THE PURPOSE OF HEMS TRAINING AND CHECKING

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. A risk assessment should be conducted when defining such HEMS operating sites, taking the following into consideration:

- (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.

13. AMC1 SPA.HEMS.130(a) is added as follows:

**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 100 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 night operations, 50 hours of VMC at night including 20 hours as pilot-in-command/commander on a helicopter.

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

#### **AMC1 SPA.HEMS.130(d) Crew requirements**

##### REGENCY

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.

##### INSTRUMENT FLIGHT TRAINING

- (a) The instrument flight training should include training as pilot flying with sole reference to instruments.
- (b) The training should take place at least every 6 months.
- (c) The training duration should be at least 45 minutes.
- (d) The 6-month validity period should be counted from the end of the month when the check was taken.
- (e) When the above training is undertaken within the last 3 months of the validity period, the new validity period should be counted from the original expiry date.
- (f) The instrument training should be conducted by a FI/TRI/SFI and should be sufficient for the pilot to demonstrate competence in 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) use of the autopilot including upper modes, if fitted.
- (g) The instrument flight training may take place in a helicopter using vision-limiting devices such as goggles or screens, or in an FSTD. The helicopter used for the training should be the helicopter type used in the HEMS operation. The helicopter is not required to be certified for IFR operations.

15. 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 front seat (co-pilot seat) during the flight. However, the HEMS technical crew member may be seated in the cabin if all of the following conditions are met:
- (1) the HEMS technical crew member is also an HHO technical crew member;
  - (2) the helicopter is equipped with a hoist;
  - (3) the flight is conducted to or from a HEMS operating site;
  - (4) a 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;
  - (5) the commander decides so.
- (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) except when seated in the cabin, the reading of checklists.
- ~~(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) ~~reading of checklists; and~~
  - ~~(4) —~~monitoring of parameters.
- ~~(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.).
- ~~(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 (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.)
- ~~(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, following completion of an initial conversion course and the associated line flying under supervision, is inexperienced until he or she has completed 50 HEMS missions.
- (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) flight crew members have 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.

16. 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.~~

17. AMC1 SPA.HEMS.130(e)(3) is added as follows:

**AMC1 SPA.HEMS.130(e)(3)**

**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.

18. GM1 SPA.HEMS.130(e)(3) is added as follows:

**GM1 SPA.HEMS.130(e)(3)**

**ILLUMINATION OF HEMS OPERATING SITES AT NIGHT**

- (a) For night operations to pre-surveyed HEMS operating sites, the illumination may be either from the ground or from the helicopter.
- (b) For night operations to non-pre-surveyed HEMS operating sites, the illumination should be at least from the helicopter.

19. 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 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<sup>9</sup>; or
  - (ii) the pilot has at least 350 hours in either multi-pilot operations or single-pilot operations with a HEMS or equivalent technical crew member, or a combination of these.
- (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 500 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;

<sup>9</sup> OJ L 311, 25.11.2011, p. 1.



(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.

20. AMC2 SPA.HEMS.130(f)(1) is added as follows:

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

**TECHNICAL CREW MEMBER TRAINING AND CHECKING SYLLABUS**

**INITIAL AND RECURRENT TRAINING COVERING PRIMARY TASKS**

*(as defined in AMC2 SPA.HEMS.130(e), paragraph (b), in SPA.HEMS.130(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) duties in the HEMS role;
  - (2) stowage, security and use of on-board medical equipment;
  - (3) practice of response to HEMS call-out;
  - (4) map reading, including:
    - (i) ability to keep track with helicopter position on map;



- (ii) ability to detect conflicting terrain/obstacles on a given route, and at a given altitude;
- (iii) use of moving maps, as required;
- (8) HEMS operating site selection and use;
- (9) basic understanding of the helicopter type in terms of location and design of normal and emergency systems and equipment, including all helicopter lights and operation of doors, and including knowledge of helicopter systems and understanding of terminology used in checklists;
- (10) the dangers of rotor running helicopters;
- (11) outside lookout during the flight;
- (12) crew coordination with in-flight call-outs, with emphasis on crew coordination regarding the basic tasks of the HEMS crew member, including checklist initiation, interruptions, and termination;
- (13) techniques for handling patients, the medical consequences of air transport on patients, and some knowledge of hospital casualty reception, and techniques for loading patients in helicopters;
- (14) warnings, and use of normal, abnormal and emergency checklists assisting the pilot as required;
- (15) the use of the helicopter intercommunications system;
- (16) dangerous goods (DGs), as relevant to cabin crew members;
- (17) security;
- (18) HEMS philosophy and HEMS rules;
- (19) basic helicopter performance principles, including the definitions of Category A certification, performance class 1, performance class 2, performance class 3 (if applicable), and public interest sites (PISs);
- (20) operational control and supervision;
- (21) meteorology;
- (22) applicable parts of SERA, as relevant to the primary tasks of the HEMS crew member;
- (23) mission planning;
- (24) early identification of pilot incapacitation;
- (25) debriefing.

#### NAVIGATION TRAINING

(as defined in AMC1 SPA.HEMS.130(e), paragraph (b)(1) and (b)(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) aeronautical map reading (additional training to (a)(4) above), navigation principles;
  - (2) navigation aid principles and use;
  - (3) crew coordination with in-flight call-outs, with emphasis on navigation issues;





- (4) applicable parts of SERA;
- (5) airspace, restricted areas, and noise-abatement procedures.

#### COMMUNICATION TRAINING

(as defined in AMC1 SPA.HEMS.130(e), paragraph (b)(2) (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 radio equipment;
  - (2) crew coordination with in-flight call-outs, with emphasis on radio communication issues.

#### MONITORING TRAINING

(as defined in AMC1 SPA.HEMS.130(e), paragraph (b)(4))

- (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) basic understanding of the helicopter type, including knowledge of any limitations to the parameters the HEMS crew member is tasked to monitor, and knowledge of the basic principles of flight;
  - (2) instrument reading;
  - (3) inside monitoring during the flight;
    - (i) aircraft state/cockpit cross-check;
    - (ii) automation philosophy and autopilot status monitoring, as relevant;
    - (iii) FMS, as relevant;
  - (4) crew coordination with in-flight call-outs, with emphasis on call-outs and actions resulting from the monitoring process; and
  - (5) flight path monitoring.

#### GROUND CREW TRAINING

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

- (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:
  - (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 underslung load operations;
  - (2) hoist operations;
  - (3) NVIS;
  - (4) IFR/PBN.

**CONVERSION COURSE GROUND TRAINING AND CHECKING WHEN CHANGING HELICOPTER TYPES**

- (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.

**INITIAL AIRCRAFT/FSTD TRAINING**

- (h) 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 described in (1) should be supervised by a HEMS pilot with a minimum experience of 500 hours in either multi-pilot operations or single-pilot operations with a HEMS technical crew member or a combination of these.
  - (4) The training may be combined with the line flying under supervision.

**LINE FLYING UNDER SUPERVISION**

- (i) 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 his or her flight operational duties assigned to him or her according to the procedures laid down in the operator's operations manual.
  - (3) Line flying under supervision should be conducted by a suitably qualified HEMS technical crew member or commander nominated by the operator.
  - (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

##### (j) 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 (h) above.

#### LINE CHECKS

##### (k) 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) During the line check, the HEMS technical crew member should demonstrate competence in carrying out normal line operations described in the operator's operations manual.
- (3) 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.
- (4) The validity period of the line check should be 12 calendar months. The validity period should be counted from the end of the month when the check was performed.
- (5) When the line check is undertaken within the last 3 months of the validity period, the new validity period should be counted from the original expiry date.
- (6) The line check should be conducted by a suitably qualified commander nominated by the operator.
- (7) 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

##### (l) 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.

- (4) The validity period of the operator proficiency check should be 12 calendar months. The validity period should be counted from the end of the month when the check was performed.
- (5) When the operator proficiency check is undertaken within the last 3 months of the validity period, the new validity period shall be counted from the original expiry date.
- (6) The operator proficiency check should be conducted by a suitably qualified instructor nominated by the operator to conduct flight crew operator proficiency checks.

#### TRAINING AND CHECKING DEVICES

##### (m) Use of FSTDs

- (1) The line check and line flying under supervision should be performed in the helicopter.
- (2) All other training and checking should be performed in an FSTD or, if it is not reasonably practicable to gain access to such devices, in an aircraft of the same type or in the case of emergency and safety equipment training, in a representative training device. 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 flight crew member.

21. GM1 SPA.HEMS.130(f)(1) is added as follows:

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

##### HEMS TECHNICAL CREW MEMBER THEORETICAL TRAINING

- (a) HEMS technical crew members should be given initial theoretical knowledge instruction followed by an examination on the following subjects, as relevant to the primary tasks and to any additional tasks allocated to them.
- (b) The following items should be covered:
  - (1) Rules of the Air, air traffic services and aerodromes, VFR procedures and, if applicable, IFR procedures;
  - (2) general principles of flight;
  - (3) general knowledge of helicopter structure, power plant, systems and airworthiness;
  - (4) helicopter mass, balance and performance;
  - (5) human performance and limitations;
  - (6) meteorology;
  - (7) navigation in practical VFR;
  - (8) flight planning;
  - (9) flight preparation and in-flight operations;
  - (10) communications;
  - (11) general flight safety in helicopter operations.
- (c) HEMS technical crew members 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) in accordance with Commission



Regulation (EU) No 1178/2011<sup>10</sup>, should be considered to fulfil the training requirements described in (b) except that holders of an aeroplane licence or theoretical knowledge examination should receive helicopter-specific training in:

- (1) general principles of flight;
- (2) general knowledge of helicopter structure, power plant, systems and airworthiness;
- (3) helicopter mass, balance and performance;
- (4) flight planning;
- (5) flight preparation and in-flight operations;
- (6) general flight safety in helicopter operations.

(d) For HEMS technical crew members, the company procedures training should cover at least the following:

- (1) introduction to the regulatory environment applicable to HEMS operations;
- (2) the relevant extracts of the operations manual, Part A, B and C;
- (3) helicopter performance;
- (4) navigation equipment (FMS/NMS/GPS) and AFCS operations as applicable;
- (5) transponder;
- (6) ACAS, HTAWS, radar, moving map as applicable.

(e) HEMS technical crew members involved in IFR operations should be trained in the following additional items:

- (1) initial IFR ground training syllabus;
- (2) introduction to IFR operations;
- (3) flight instrument systems;
- (4) navigation;
- (5) air traffic control systems;
- (6) instrument charts and procedures;
- (7) aviation weather;
- (8) IFR flight planning;
- (9) company operations manual (as pertaining to IFR operations).

22. GM2 SPA.HEMS.130(f)(1) is added as follows:

**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.

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

<sup>10</sup> OJ L 311, 25.11.2011, p. 1.

**AMC1 SPA.HEMS.140 Information and documentation**

## OPERATIONS MANUAL

The operations manual should include all of the following:

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

24. GM1 SPA.HEMS.140(a) is added as follows:

**GM1 SPA.HEMS.140(a) Information and documentation**

## HEMS TACTICAL RISK ASSESSMENT

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

The following should 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.

25. GM1 SPA.HEMS.145(b) is added as follows:

**GM1 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 is at a location without weather reporting, the operator should have means for observing and recording local weather conditions, including cloud base and visibility from the HEMS operating base.



## 4. Impact assessment (IA)

### 4.1. Public interest sites (PISs)

The issues to be addressed are described in Chapter 2.1.1.

#### 4.1.1. Who is affected

Hospitals, health authorities, NAAs, operators, pilots, and authorities in charge of building permissions could be affected by the amendments to the rules regarding PISs.

#### 4.1.2. How could the issue/problem evolve

With the current set of rules and regulations:

- PIS derogations should be dealing with historical sites only. It seems that PIS derogations are being used not only to continue the use of existing sites, but also to deviate from the helicopter performance rules for new hospital sites that are coming into service.
- Hospitals are constructing new buildings continuously;
- At PISs, there is an opportunity to create new rooftop helipads with sufficient dimensions and obstacle clearance every time a new building is constructed at the hospital site. This would allow to terminate the PIS derogation and to improve safety. These opportunities are often missed because there is no incentive to improve PISs and no deadline to phase out the current derogations;
- At hospital sites that can be operated under performance class 1 (PC1), the current rules do not prevent helicopter flight paths to be obstructed by new buildings and obstacles. In some MSs, there are no other schemes to prevent helicopter flight paths from being obstructed by new obstacles.  
If this happens, and the hospital landing site existed before 2002 or 2014, it may become a PIS;
- It is likely that in the future there will be more PISs, and not less, because of the changing obstacle environment at hospitals;
- For the same reason, it is likely that the obstacle environment will worsen at PISs, instead of improving towards compatibility with the helicopter performance requirements;
- The PIS rules are likely to become a global exemption from the performance requirements at hospital sites in some MSs, with a high cost to safety.

#### 4.1.3. What we want to achieve

The objectives are already included in Section 2.2. Furthermore, this detailed issue is related to the following specific objective:

- to ensure that the trend described in Section 4.1.2 above is reversed, ensure that there are no new PISs, and that the obstacle environment does not worsen at existing PISs.





**4.1.4. How it could be achieved — options**

The options that have been analysed are the following:

<b>Option No</b>	<b>Description</b>
0	No policy change (no change to the rules; risks remain as outlined in the issue analysis).
1	Amend the PIS rules as proposed.

Discarded options:

A number of options had already been considered during the consultation of the related concept paper and have been discarded. These options were the following:

- The option to phase out the categories of PISs, or all PISs, by 2022 or later: it was considered that there would be no viable alternative at some hospital sites, and this would invite new exemptions and derogations to be filed;
- The option to use safety promotion at European level only: the conflicting interests are too important between the aviation industry, the health industry and the authorities in charge of building permissions. Safety promotion would not work. Safety promotion at national level, as adapted to local circumstances, may be useful in addition to EASA rulemaking.

**4.1.5. Applied methodology**

The methodology applied to this RIA is the multi-criteria analysis (MCA), which allows comparing all the options by scoring them against a set of criteria.

The MCA covers a wide range of techniques that aim to combine a variety of positive and negative impacts into a single framework to allow an easier comparison of scenarios.

The MCA key steps for this RIA include the following:

- establishing the criteria to be used for comparing the options (these criteria must be measurable, at least in qualitative terms);
- scoring how well each option meets the criteria (the scoring needs to be relative to the baseline scenario);
- ranking the options by combining their scores.

The criteria used to compare the options were derived from the Basic Regulation and the guidelines for the RIA. The principal objective of EASA is to 'establish and maintain a high uniform level of safety', in accordance with Article 2(1) of the Basic Regulation. Additionally, the Basic Regulation identifies environmental, economic, social, and proportionality objectives.

For the scoring of the impacts, a scale of – 5 to + 5 is used to indicate the negative and positive impacts of each option (i.e. from 'very high' to 'very low' negative/positive impacts). The intermediate levels of benefits are termed 'high', 'medium' and 'low', providing a total of five levels in each direction (five in the positive and five in the negative one), with a 'no impact' score also being possible.



This methodology applies as well to the options analysed for the other issues that are discussed in this NPA.

Option 0 (no change) is assessed in each paragraph of the impact assessment. The other options are numbered as follows: The topic number, followed by a letter if several options are proposed in a defined topic. Option 2a is option 'a' of topic number 2.

#### 4.1.6. Public interest sites (PISs) — analysis of impacts

##### 4.1.6.1 Public interest sites (PISs) — safety impact

Option 0: Compared to the current situation, negative safety impacts in some MSs are expected if no action is taken, as already mentioned in Section 4.1.2 above.

Option 1: Amending the rules will improve the current safety issue.

##### 4.1.6.2 Public interest sites (PISs) — social impact

Option 0 and Option 1: the social impact is deemed to be negligible for both options because health services should not be impacted.

##### 4.1.6.3 Public interest sites (PISs) — economic impact

Option 0: No impacts expected.

Option 1: With Option 1, authorities will face higher costs due to the need for a larger workforce (including NAAs and authorities in charge of building permissions) to ensure that the obstacle environment does not worsen at PISs. Hospitals located in congested hostile areas and that wish to receive HEMS helicopter traffic will also need to better control the obstacle environment at the helicopter landing site, potentially with the help of authorities in charge of building permissions. A very low negative economic impact is, therefore, expected.

##### 4.1.6.4 Public interest sites (PISs) — conclusion

<i>Column 1</i>	<i>Option 0 No change</i>	<i>Option 1 NPA proposal</i>
Safety impact	- 1	+ 3
Social impact	0	0
Economic impact	0	- 1
TOTAL	- 1	+ 2

Based on the impacts, the conclusion can be drawn that Option 1 is clearly supported by the impact assessment. The following question will help to better assess the scale of the issue.

#### Question to NAAs:

- How many PISs are approved in your territory?
- If the rules don't change, do you expect the number of approved PISs to increase or decrease in the next 5 years?
- What would be the percentage?



Please use the EU Survey 'RIA questions for RMT.0325' to answer all questions related to the impact assessment. The survey is available at:

[https://ec.europa.eu/eusurvey/runner/RMT0325\\_questions\\_for\\_NPA](https://ec.europa.eu/eusurvey/runner/RMT0325_questions_for_NPA)



## 4.2. Mountain HEMS operations and rescue operations other than SAR operations

The issue to be addressed is described in Section 2.1.2.

### 4.2.1. Who is affected

Hospitals, health authorities, NAAs, operators, and pilots could be affected by the amendments to the rules regarding mountain operations.

### 4.2.2. How could the issue/problem evolve

The lack of harmonisation across Europe and the use of potentially competing national rules could drive a race towards deregulations.

### 4.2.3. What we want to achieve

The objectives are already included in Section 2.2. Furthermore, this detailed issue is related to the following specific objective:

— to provide a proportionate framework for mountain HEMS and rescue operations other than SAR operations.

### 4.2.4. How it could be achieved — options

The options that have been considered are the following:

<b>Option No</b>	<b>Description</b>
0	No policy change (no change to the rules; risks remain as outlined in the issue analysis).
2a	Include mountain HEMS operations and rescue operations other than SAR operations in the rules, and introduce the use of the cargo sling in HEMS operations.
2b	Introduce performance and oxygen alleviations for mountain HEMS operations.
2c	Make the rules on the seating of the HEMS crew member more performance-based.

Discarded options:

A number of options had already been considered during the consultation of the related concept paper and have been discarded. These options were the following:

- The option to consider all HEMS activities as state or similar services was not considered to be the way forward by a number of stakeholders that are in favour of European regulations;
- The option to consider HEMS activities as part of SPO to better include mountain and rescue operations: this option was considered to be unsafe by the majority of the stakeholders;
- The option to introduce flexibility provisions was not considered to be useful, as these already exist in the Basic Regulation) and are highly likely to remain in the new Basic Regulation.



#### 4.2.5. Mountain HEMS operations and rescue operations other than SAR operations — analysis of impacts

##### 4.2.5.1 Mountain HEMS operations and rescue operations other than SAR operations — safety impact

Option 0: No impact expected.

Option 2: The oxygen part of Option 2b introduces alleviations to the rules, together with a number of mitigations on the safety side. The alleviation results in oxygen rules that are possible to be complied with, instead of the current rules which are simply disregarded. The mitigations that are introduced have a positive safety impact as they are now much more oriented to the characteristics of mountain HEMS and rescue operations.

The performance part of Option 2b proposes to align the rules with the capabilities of high-performance twin-engined helicopters, in order to allow the operation of a whole mission under the same regulatory framework.

In addition, the use of Category A or Category A equivalent helicopters is an alignment with current practice and avoids a reduction of safety during the entire HEMS mission that would take place if Category B helicopters were operated in HEMS.

Category A helicopters appear to be safer, not only in respect of risk of engine failure and other failures due to system redundancy.

In case rescue operations (other than HEMS) are operated with single-engined helicopters, the combination of Option 2a and Option 2b has a significant positive impact on safety because Category A helicopters will be operated instead.

Option 2c is designed to have a negligible safety impact.

Overall, Option 2 is expected to have a positive safety impact compared to Option 0 because it will extend the scope of HEMS operations where it is reasonable to do so, while defining the best practice for the use of the cargo sling.

##### 4.2.5.2 Mountain HEMS operations and rescue operations other than SAR operations — social impact

Option 0: No impact expected.

Option 2: The alleviations introduced in Options 2a and 2b ensure that more, or at least an equal number of mountain HEMS and rescue operations can be performed.

For authorities, the impact would be positive, as the introduction of harmonised European regulations will allow competent authorities which wish to do so to adopt them instead of developing national regulations and alternative means of compliance. The impact on authorities is therefore positive.

Option 2c has no social impact.

##### 4.2.5.3 Mountain HEMS operations and rescue operations other than SAR operations — economic impact

Option 0: No impact expected.

Option 2: The investments required when introducing the new rules as detailed in Option 2a and 2b are considered to be rather limited compared to Option 0. The new rules are mainly the result of adjusting them to the everyday practice that is currently in place for HEMS operations in different MSs.

However, the economic impact of Option 2b will not be negligible for a small number of operators:



- In case other than HEMS rescue operations are conducted with single-engined helicopters, the combination of Option 2a and 2b has a significant negative impact because operators will have to invest in Category A certified helicopters with significantly higher operating and capital costs.

This negative economic impact is partly offset by the capability of Category A certified helicopters to complete the entire mission, thus avoiding the inefficiency of a rendezvous system.

- A small number of twin-engined helicopters used in HEMS in the mountains may not be capable of the helicopter performance required at high altitudes close to 10 000 ft density altitude (the proposed requirements being based on the performance of recent helicopters such as the EC135 T3 and the AW109 SP). As the number of helicopters concerned is considered to be small, and no change in helicopter type is expected (only variants), the economic impact is limited.

Oxygen part of Option 2b: as oxygen is already needed for medical purposes in most HEMS helicopters, the economic costs of an approved oxygen storage and dispensing unit are considered to be very low. If costs are higher than expected in specific circumstances, operators can also choose not to carry oxygen on high-altitude HEMS and rescue operations using the oxygen alleviation, in which case the highest costs come from a once-in-a-lifetime hypoxia training for each pilot.

Option 2c: the proposal allows HEMS HHO operations to be conducted with one crew member less in specific cases. This has a positive economic impact.

From the perspective of a level playing field across Europe, the introduction of harmonised European rules with Options 2a, 2b and 2c is considered to be positive. Cross-border cooperation in mountain areas may also benefit from harmonised European rules.

#### 4.2.5.4 Mountain HEMS operations and rescue operations other than SAR operations — conclusion

<i>Column 1</i>	<i>Option 0 No change</i>	<i>Option 2a Rescue and sling NPA proposal</i>	<i>Option 2b Oxygen and performance NPA proposal</i>	<i>Option 2c Technical crew member seating NPA proposal</i>
Safety impact	0	+ 1	+ 1	0
Social impact	0	+ 2	+ 2	0
Economic impact	0	0	- 2	+ 1
<b>TOTAL</b>	<b>0</b>	<b>+ 3</b>	<b>+ 1</b>	<b>+ 1</b>

Based on this assessment, it is proposed to introduce Options 2a, 2b, and 2c in combination. The following questions are asked in order to better assess the costs and benefits of the performance part of Options 2a and 2b.

**Question to helicopter operators that conduct mountain operations at high altitudes (8 000 ft or higher):**

- Will you be affected by the EASA helicopter performance rules if they are to be applied for mountain operations?
- Is your fleet capable of meeting the proposed helicopter performance requirements to the highest altitudes in your area, up to 10 000 ft density altitude?
- If not, how much will it cost to adapt your fleet?

**Question to helicopter operators that conduct other than SAR rescue operations:**

- How many helicopters in your fleet are engaged in such operations?
- Do you operate such missions with single-engine or twin-engine helicopters?
- If you use single-engine helicopters, how many of them will need to be replaced by twins?
- How much will it cost: Fixed costs? Recurrent costs?

**Please use the EU Survey 'RIA questions for RMT.0325' to answer all questions related to the impact assessment. The survey is available at:**

[https://ec.europa.eu/eusurvey/runner/RMT0325\\_questions\\_for\\_NPA](https://ec.europa.eu/eusurvey/runner/RMT0325_questions_for_NPA)

### **4.3. Other than mountain HEMS operations**

The issue to be addressed is described in Section 2.1.3.

#### **4.3.1. Who is affected**

Hospitals, health authorities, NAAs, operators, and pilots could be affected by the amendments to the rules regarding HEMS operations.

#### **4.3.2. How could the issue/problem evolve**

As already discussed in Section 2.1 and 2.1.3, HEMS is an activity that is prone to risk-taking. Available accident data indicates that the current rules do not sufficiently ensure the safe execution of this type of flights, especially during night and in marginal weather conditions. Several MSs have developed additional requirements in order to mitigate shortcomings in the current rules.

#### **4.3.3. What we want to achieve**

The objectives are already included in Section 2.2. Furthermore, this detailed issue is related to the following specific objective:

- to improve the safety of HEMS operations, especially at night and in marginal weather conditions.



#### 4.3.4. How it could be achieved — options

The following Options 3a to 3e were developed and analysed in the current working groups, while Option 4 had been previously identified as valid during previous rulemaking group sessions:

Option No	Short title	Description
0		No policy change.
3a		Improve the situational awareness of pilots regarding the obstacle environment during night flights by introducing the requirement of having a device available with a moving map display, providing own-ship position and obstacles.
3b		Simplify the HEMS VFR minima by day and night: Merging the visibility minima for 499–400 ft and 399–300 ft ceiling and for one or two pilots. Changing cloud base for ceiling. Slightly increasing visibility minima at night. Making alleviations accessible only to operators with NVIS equipment and full technical crew member training.
3c		Enable IFR operations in HEMS by introducing the possibility of reduced HEMS operating minima when instructed to ‘proceed VFR’ following an instrument approach or when instructed to ‘proceed VFR’ prior to an IFR departure.
3d		Enhance crew training requirements by increasing the minimum required pilot experience for HEMS flights during night, by improving IFR training for pilots that not hold a current IR, and better define HEMS technical crew member training and checking.
3e		Require the helicopter to be equipped with a basic stability augmentation system or autopilot for single-pilot operations at night.
4		Mandate NVIS at night for HEMS operations to non-pre-surveyed operating sites outside well-illuminated built-up areas.

Discarded options:

A number of options had already been considered during the consultation of the related concept paper. The introduction of HTAWS was not supported, and dry weather was not considered a good enough mitigation measure to address the current safety risks in HEMS operations. These options were, therefore, discarded.

#### 4.3.5. Other than mountain HEMS operations — analysis of impacts

##### 4.3.5.1 Other than mountain HEMS operations — safety impact

Option 0: No impacts expected.

Option 3: Option 3a, improving the situational awareness by means of requiring a device with a moving map display and providing information regarding own-ship position and obstacles, mitigates the risk of collisions with these obstacles. The safety impact is, therefore, considered to be significantly positive.

The safety impact of Option 3b is the following:





- Increasing minima from 1 000 to 1 500 m for two-pilot operations by day, and increasing minima from 2 500 to 3 000 m for two-pilot operations by night: positive safety impact.
- Reducing minima from 2 000/3 000 to 1 500 m by day for other kinds of operations: the negative safety impact is partially mitigated by means of improving IMC training for pilots that do not hold a current IR (Option 3d).
- Making the HEMS reduced minima only accessible with full HEMS crew member training (in combination with Option 3d) and NVIS equipment: positive safety impact.

Therefore, the overall safety impact of Option 3b is positive by night and negative by day. The negative impact by day can be offset by Option 3d.

Option 3c, enabling IFR operations in HEMS by introducing the possibility of reduced HEMS operating minima when instructed to 'proceed VFR' following an instrument approach or when instructed to 'proceed VFR' prior to an IFR departure, covers a new set of rules following the latest developments regarding the use of point in space (PinS) approaches and departures to an initial departure fix (IDF). Option 3c proposes reduced VFR minima for HEMS operations under IFR using PinS approaches and departures to an IDF with 'proceed VFR'. The reason for this is that when the missed approach point (MAPt) of the PinS approach and the IDF are very close to the heliport or operating site, the VFR minima may be much higher than needed for the purpose of achieving a landing or a go-around, especially at night. The aim is to align the VFR minima with the visibility needed to complete the procedure. Taking into account the fact that in order to execute these flights the pilot needs to hold a current IR, that Option 3d increases the pilot experience requirements for night HEMS, and that Option 3e requires helicopters to be equipped with a basic stability augmentation system or autopilot for single-pilot operations at night, it can be concluded that the negative safety impacts of Option 3c, if any, are sufficiently mitigated.

Option 3d is all about further enhancing crew training requirements by increasing the minimum required pilot experience for HEMS flights during night, by improving IFR training for pilots that do not hold a current IR, and by further improving the training of HEMS technical crew members. The aim is to mitigate the risk related to a loss of visual reference, and to reduce pilot workload by introducing crew coordination concepts. Compared to Option 0, Option 3d will have a positive safety impact and can be further enhanced by the implementation of Option 3e.

The loss of visual reference has been identified as one of the most important root causes of HEMS accidents/serious incidents over the past 10 years. Option 3e, like Option 3d, aims to mitigate this risk by requiring helicopters to be equipped with a basic stability augmentation system or autopilot for single-pilot operations at night. Higher standards of automation for single-pilot operations at night are desirable in order to achieve a significant reduction in workload. Basic handling of the helicopter will require less attention, resulting in more time available to deal with the loss of visual reference. Alternatively, an operator can choose to perform night HEMS flights with two pilots. With two pilots, one can be assigned the task of handling the helicopter while the other would be dealing with the loss of visual reference. The safety impact of this option is considered to be significant.

Option 4: NVIS.

Mandating NVIS at night for HEMS operations at non-pre-surveyed operating sites outside well-lit areas will significantly improve the safety of HEMS operations at night.



Night HEMS operations to pre-surveyed areas will remain possible, provided the obstacle data regarding such sites is updated on a regular basis. This will also improve the safety of HEMS flights without NVIS.

#### 4.3.5.2 Other than mountain HEMS operations — social impact

Option 0 and Option 4: No impacts expected.

Option 3: Option 3a will not directly influence the number of flights being executed, as it primarily aims to reduce the risk of collision with obstacles. The same applies to Option 3d, as this option is solely related to experience and training.

The social impact of Options 3b and 3c is positive, as it is expected that both options make it possible to execute more HEMS flights compared to Option 0. Health services will benefit from the increased reliability of HEMS flights.

Option 3e has no direct impact on the number of HEMS flights, unless the costs related to this option are so high, that health services in some MSs will no longer be able to afford helicopter services. The probability that this would happen is kept very low by a 5-year implementation time frame, and is therefore considered negligible.

The impact of Options 3a, 3d, and 3e on competent authorities is considered to be positive, as there will be no need any more for alternative means of compliance and operational directives. This will also improve the level playing field.

#### 4.3.5.3 Other than mountain HEMS operations — economic impact

Option 0: No impacts expected.

Option 4: The economic impact of Option 4 is limited because a low-cost alternative to NVIS is provided. Operators may elect to operate at night without NVIS. In this case, they should instead keep a directory of pre-surveyed operating sites outside well-lit built-up areas. The regular update of this directory generates costs that are considered to be negligible.

Option 3: The economic impact of Option 3a is considered to be negative, as investments have to be made to equip helicopters with the proposed function. However, the costs are reduced by the option to use electronic flight bags (EFBs).

The economic impact of Option 3b is positive for daytime operations, as the minima are lowered, but negative for night-time operations because investments are necessary to benefit from lower NVIS operating minima. If the operator opts not to invest in NVIS, then the operating minima are increased compared to Option 0 and this might have a negative impact on the number of flights being executed. On average, the economic impact of Option 3b is considered to be slightly negative compared to that of Option 0.

Option 3c is only applicable when operators want to benefit from the possibilities it offers. If operators do not want this, no additional investments are necessary and the situation is comparable to that of Option 0. Therefore, the economic impact is assessed to be neutral.

Option 3d requires investments in training. The cost of additional flight crew member training is considered to be limited. The cost of additional training of HEMS technical crew members will heavily



depend on current practices by the different operators. For some operators, there will be no or limited economic impact, while for others the investment will be larger.

Option 3e requires significant investments. It could even lead to a situation where certain helicopters currently being used for HEMS flights will have to be replaced, if two-pilot operations are not considered, and if the fitting of a stability augmentation system or autopilot on the existing helicopter is not practical, too costly, or if the additional mass reduces the payload too much.

A short study of the HEMS fleet indicates that very few of the oldest HEMS helicopters are likely not to comply with Option 3e. The 5-year implementation period is proposed to reduce the economic impact of this measure, as many of these older helicopters will become obsolete regardless of the proposed change. The economic impact of Option 3e remains significantly negative.

#### 4.3.5.4 Other than mountain HEMS operations — conclusion

Column 1	Option 0 No change	Option 3a	Option 3b	Option 3c	Option 3d	Option 3e	Option 4 NVIS
Safety impact	0	+ 3	– 2 (day) + 2 (night)	0	+ 3	+ 4	+ 3/+ 1
Social impact	0	+ 1	+ 2	+ 3	+ 1	+ 1	0
Economic impact	0	– 1	– 1	0	– 2	– 4	– 1/0
<b>TOTAL</b>	<b>0</b>	<b>+ 3</b>	<b>+ 1</b>	<b>+ 3</b>	<b>+ 2</b>	<b>+ 1</b>	<b>+ 2/+ 1</b>

Conclusion: Considering the consensus between industry, authorities and pilot associations to improve the safety of HEMS operations, and also considering that the safety impact should weigh more than the other factors, the impact assessment supports the NPA proposal to combine all the above-mentioned options.

The following questions will help to better assess the costs and benefits of Option 3e.

#### Question to all helicopter operators: STABILISATION SYSTEM OR AUTOPILOTS

- How many helicopters does your fleet comprise?
- How many helicopters will be impacted by 2023?
- What will be the average age of the impacted helicopters by 2023?
- What will be the cost of implementing:
  - retrofit?
  - fleet change?
  - multi-pilot operations?

Please use the EU Survey 'RIA questions for RMT.0325' to answer all questions related to the impact assessment. The survey is available at:

[https://ec.europa.eu/eusurvey/runner/RMT0325\\_questions\\_for\\_NPA](https://ec.europa.eu/eusurvey/runner/RMT0325_questions_for_NPA)



#### 4.4. Delegation of maintenance tasks to the technical crew member

##### 4.4.1. The issue to be addressed

Part-145 maintenance organisations are required to use appropriate aircraft-rated certifying staff, qualified as Category B1, B2 or B3 under Part-66. For the line maintenance of an aircraft that operates away from a supported location, the maintenance organisation may derogate from the rules and issue a limited certification authorisation to the commander, who will be in charge of small maintenance tasks without holding a Part-66 licence. The issue is whether to extend this derogation to the technical crew member for the maintenance of the hoist.

##### 4.4.2. Who is affected

NAAAs, HEMS operators, maintenance organisations, maintenance personnel, HEMS pilots, and technical crew members.

##### 4.4.3. How could the issue/problem evolve

Unless they are amended, the rules will remain prescriptive and will require either the commander or a licensed engineer to be in charge of the hoist maintenance.

##### 4.4.4. What do we want to achieve

To make the rules more performance-based, and allow the technical crew member in charge of operating the hoist to be trained to the same proficiency level as the pilot and be allowed to be in charge of limited hoist maintenance.

##### 4.4.5. How it could be achieved — options

The following options have been analysed:

Option No	Description
0	No policy change.
5	Extent the issue of a limited certification authorisation to the HEMS crew member in the case of aircraft that operate away from a supported location.

#### 4.4.6. Delegation of maintenance tasks — analysis of impacts

##### 4.4.6.1 Delegation of maintenance tasks — safety impact

Option 0: No impacts expected.

Option 5: There have been cases of damage to the cable not being detected by commanders during the 'daily after the last flight' cable inspection. Luckily, they were detected during regular maintenance performed by Part-66 licensed personnel.

Technical crew members do not have to have an aviation background or hold a licence. If they are in charge of hoist maintenance, the risk of damage going undetected and thus resulting in lack of maintenance will increase. Safety will be affected.

##### 4.4.6.2 Delegation of maintenance tasks — social impact

Option 0: No impacts expected.



Option 5: A low positive impact is expected due to reduced pilot workload and increased technical crew member experience.

#### 4.4.6.3 Delegation of maintenance tasks — conclusion

The impacts can be summarised as follows:

	<b>Option 0</b> <b>No change</b>	<b>Option 5</b>
Safety impact	0	- 2
Social impact	0	+ 1
<b>TOTAL</b>	<b>0</b>	<b>- 1</b>

Conclusion: Option 5 is not supported.

#### 4.5. Monitoring and evaluation

Monitoring is a continuous and systematic process of data collection and analysis about the implementation/application of a rule/activity. It generates factual information for future possible evaluations and impact assessments and helps to identify actual implementation problems. With respect to this proposal, and according to what is included in the preferred option, EASA suggests monitoring the following:

<b>What to monitor</b>	<b>How to monitor</b>	<b>Who should monitor</b>	<b>How often</b>
Number and main causes of occurrences (accidents/serious incidents) related to HEMS operations	Reports in ECR and information collected at MS level	EASA and national authorities	On a recurrent basis
Relevance of HEMS rules and regulations	Number of MSs operating HEMS under national regulations, extent of the variations between HEMS and national rules	EASA and national authorities	On a recurrent basis

**Stakeholders are invited to provide:**

- **quantified justification of the possible impacts (e.g. economic, social, safety) of the options proposed, or alternatively to propose a justified solution to the issue;**
- **any other information they may find necessary to bring to the attention of EASA; as a result, the relevant parts of the RIA might be modified on a case-by-case basis.**

## 5. Proposed actions to support implementation

- Implementation and standardisation efforts regarding the new requirements introduced in Part-ARO

*(Competent authorities, EASA)*

- Providing supporting clarifications in electronic communication tools (SINAPSE or equivalent), and creating a platform for Member States to exchange good practices on public interest sites (PISs).

*(Primarily targeted audience: competent authorities)*

- Amending the current version of the frequently asked questions (FAQs) on the EASA website regarding:

- the applicability of the Air Operations Regulation to mountain rescue operations;
- explanations on the carriage of cargo together with persons under HEMS HEC.

*(Competent authorities, operators, and other stakeholders)*



## 6. References

### 6.1. Affected/related regulations

- Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EU) No 216/2008 of the European Parliament and of the Council (OJ L 296, 25.10.2012, p. 1)

### 6.2. Affected/related decisions

- Decision No 2014/025/R of the executive director of the Agency of 28 July 2014 adopting Acceptable Means of Compliance and Guidance Material to Part-ARO of Regulation (EU) No 965/2012 and repealing Decision 2014/014/R of the Executive Director of the Agency of 24 April 2014 'AMC and GM to Part-ARO — Issue 3'
- Decision 2014/017/R of the Executive Director of the Agency of 24 April 2014 adopting Acceptable Means of Compliance and Guidance Material to Part-ORO of Regulation (EU) No 965/2012 and repealing Decision 2012/017/R of the Executive Director of the Agency of 24 October 2012 'AMC and GM to Part-ORO — Issue 2'
- Decision 2014/015/R of the Executive Director of the Agency of 24 April 2014 adopting Acceptable Means of Compliance and Guidance Material to Part-CAT of Regulation (EU) No 965/2012 and repealing Decision 2012/018/R of the Executive Director of the Agency of 24 October 2012 'AMC and GM to Part-CAT — Issue 2'
- Decision No 2012/019/Directorate R of the Executive Director of the Agency of 24<sup>th</sup> October 2012 on Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the council 'Acceptable Means of Compliance and Guidance Material to Part-SPA'

### 6.3. Other reference documents

- ICAO Annex 6 to the Chicago Convention on International Civil Aviation — Operation of Aircraft, Chicago, 7 December 1944
- Commission Implementing Regulation (EU) No 923/2012 laying down the common rules of the air and operational provisions regarding services and procedures in air navigation and amending Implementing Regulation (EU) No 1035/2011 and Regulations (EC) Nos 1265/2007, 1794/2006, 730/2006, 1033/2006 and (EU) No 255/2010, as amended by Commission Implementing Regulation (EU) 2016/1185 of 20 July 2016



## 7. Appendix

Not applicable.

