

Annex IV to ED Decision 2023/007/R

**'AMC & GM to Annex V (Part-SPA) to Commission Regulation (EU) No 965/2012 —
Issue 1, Amendment 14'**

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

- (a) deleted text is ~~struck through~~;
- (b) new or amended text is highlighted in **blue**;
- (c) an ellipsis '[...]' indicates that the rest of the text is unchanged.

Note to the reader

In amended, and in particular in existing (that is, unchanged) text, 'Agency' is used interchangeably with 'EASA'. The interchangeable use of these two terms is more apparent in the consolidated versions. Therefore, please note that both terms refer to the 'European Union Aviation Safety Agency (EASA)'.

The Annex to Decision N° 2012/019/Directorate R of the Executive Director of the Agency of 24 October 2012 is amended as follows:

GM2 SPA.LVO.100 Low-visibility operations and operations with operational credits

ILS AND GLS CLASSIFICATION

- (a) The ILS and GLS/GBAS classification systems are specified in ICAO Annex 10 and GM2 SPA.LVO.110.

[...]

AMC3 SPA.LVO.100(b) Low-visibility operations and operations with operational credits

INSTRUMENT APPROACH OPERATIONS IN LOW-VISIBILITY CONDITIONS — EFFECT ON LANDING MINIMA OF TEMPORARILY FAILED OR DOWNGRADED EQUIPMENT FOR APPROACH OPERATIONS WITH A DH BELOW 200 ft

[...]

Table 6

Failed or downgraded equipment —effect on landing minima CAT II/III operations

Failed or downgraded equipment		Effect on landing minima			
		CAT III no DH	CAT III DH<50 ft	CAT III DH \geq 50 ft	CAT II
Failed-or-downgraded-equipment	Navaid stand-by transmitter	Not allowed	RVR 200 m	No effect	
	Outer marker (ILS)	No effect if the required height versus glide path can be checked using other means, e.g. DME fix			
	Middle marker (ILS)	No effect			
	DME	No effect if replaced by RNAV (GNSS) information or the outer marker			
	RVR assessment systems	At least one RVR value to be available on the aerodrome	On runways equipped with two or more RVR assessment units, one may be inoperative		
	Approach lights	No effect	Not allowed for operations with DH >50 ft		Not allowed

Failed or downgraded equipment	Effect on landing minima			
	CAT III no DH	CAT III DH<50 ft	CAT III DH  50 ft	CAT II
Approach lights except the last 210 m	No effect			Not allowed
Approach lights except the last 420 m	No effect			
Standby power for approach lights	No effect			
Standby power for runway lights with 1-second switchover time	No effect	Not allowed	Day: RVR 550 m	Day: RVR 550 m
	No effect		Night: RVR 550 m	Night: RVR 550 m
Edge lights	No effect	Day: no effect	Day: no effect	Day: no effect
		Night: RVR 550 m	Night: RVR 550 m	Night: not allowed
Threshold lights	No effect	No effect	Day: no effect	Day: no effect
			Night: RVR 550 m	Night: not allowed
Runway end lights	No effect if centre line lights are serviceable			
Centre line lights	Day: RVR 200 m	Not allowed	Day: RVR 300 m	Day: RVR 350 m
	Night: not allowed		Night: RVR 400 m	Night: RVR 550 m (400 m with HUD or autoland)
Centre line lights spacing increased to 30 m	RVR 150 m		No effect	
TDZ lights	No effect	Day: RVR 200 m	Day: RVR 300 m	
		Night: RVR 300 m	Night: RVR 550 m, 350 m with HUD or autoland	
Taxiway light system	No effect			

Table 7

Failed or downgraded equipment — effect on landing minima

Operational credits

Failed or downgraded equipment		Effect on landing minima			
		SA CAT I	SA CAT II	EFVS-A	EFVS-L
Failed or downgraded equipment	Navaid stand-by transmitter	No effect			
	Outer marker (ILS)	No effect if replaced by height check at 1 000 ft			
	Middle marker (ILS)	No effect			
	RVR assessment systems	On runways equipped with two or more RVR assessment units, one may be inoperative			
	Approach lights	Not allowed As per Table 8	Not allowed As per Table 9	As per IAP	As per IAP
	Approach lights except the last 210 m	Not allowed As per Table 8	No effect As per Table 9	As per IAP	As per IAP
	Approach lights except the last 420 m	No effect As per Table 8	No effect As per Table 9	As per IAP	As per IAP
	Standby power for approach lights	No effect			
	Edge lights, Threshold lights	Day: No effect	Day: no effect	As per IAP	As per IAP
		Night: not allowed	Night: RVR 550 m	As per IAP	As per IAP
	Runway end lights	No effect if centre line lights are serviceable		As per IAP	
	Centre line lights	Day: RVR 400 m	Day: RVR 350 m	As per IAP	As per IAP
		Night: RVR 550 m	Night: RVR 400 m	As per IAP	As per IAP
	Centre line lights spacing increased to 30 m	No effect	No effect	As per IAP	As per IAP
	TDZ lights	Day: no effect	Day: RVR 350 m	As per IAP	

Failed or downgraded equipment		Effect on landing minima			
		SA CAT I	SA CAT II	EFVS-A	EFVS-L
		Night: no effect	Night: RVR 350 m	As per IAP	
	Taxiway light system	No effect			

GM4 SPA.LVO.100(b) Low-visibility operations and operations with operational credits

INSTRUMENT APPROACH OPERATIONS IN LOW-VISIBILITY CONDITIONS — EFFECT ON LANDING MINIMA OF TEMPORARILY FAILED OR DOWNGRADED EQUIPMENT FOR APPROACH OPERATIONS ~~WITH A DH BELOW 200 ft~~

[...]

AMC1 SPA.LVO.105(g) Specific approval criteria

SAFETY ASSESSMENT — MONITORING, DATA COLLECTION AND PERFORMANCE INDICATORS **FOR APPROACH OPERATIONS**

[...]

AMC1 SPA.LVO.110 Aerodrome-related requirements, including instrument flight procedures

SUITABLE AERODROMES — **APPROACH AND LANDING** ASSESSMENT — AEROPLANES

[...]

Table 14

[...]

- An ILS facility performance category II installation can only be credited **to** an operation using GAST C.

[...]

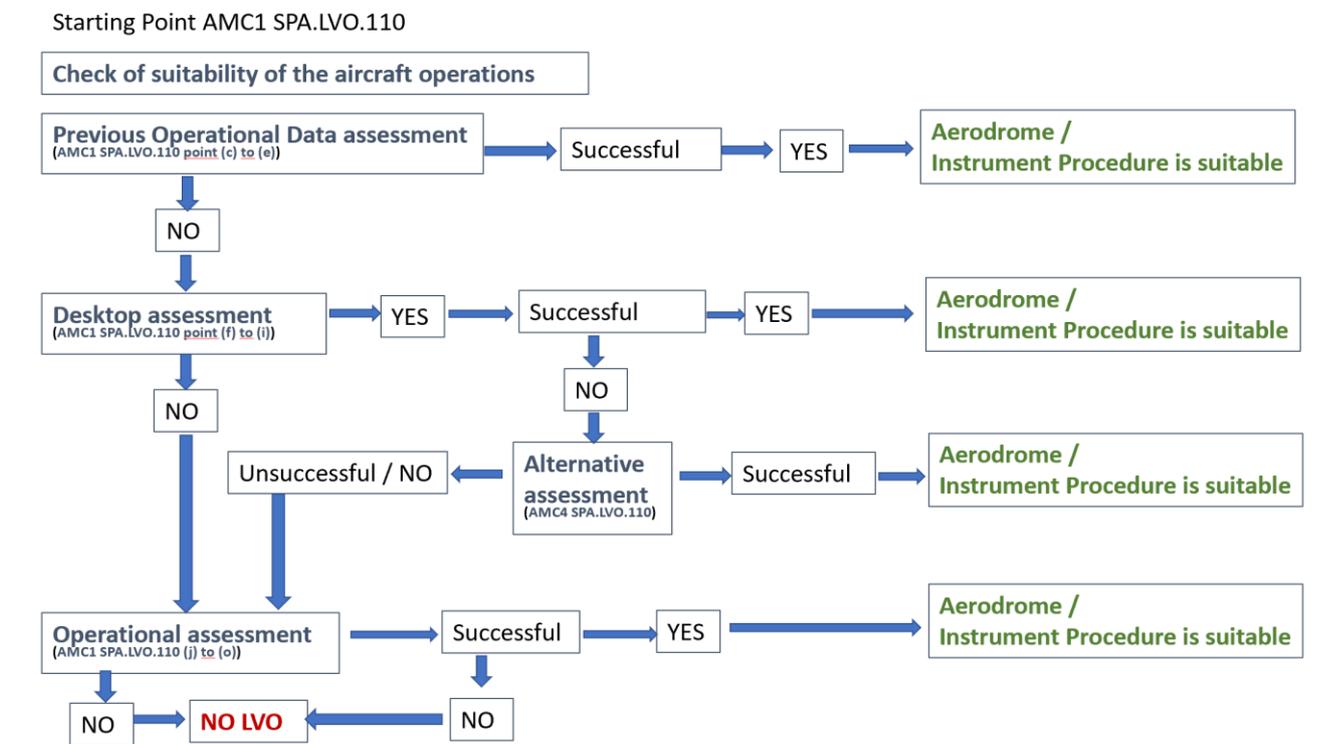
Table 15 Meteorological conditions for approaches and landings intended for operational assessment

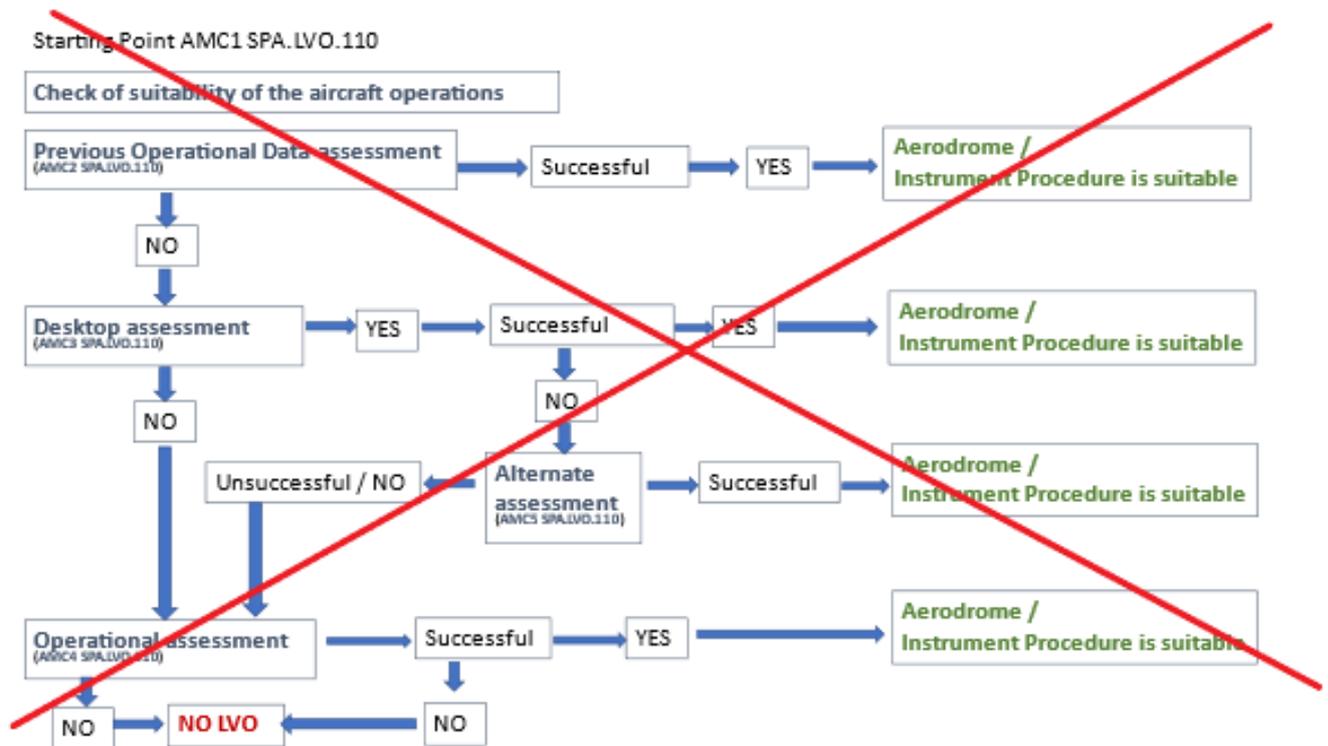
[...]

GM1 SPA.LVO.110 Aerodrome-related requirements, including instrument flight procedures

ASSESSMENT OF AERODROMES FOR THE INTENDED OPERATIONS — AEROPLANES

A diagram with a schematic of the assessment described in AMC1 SPA.LVO.110 *Aerodrome-related requirements, including instrument flight procedures* is provided below:





GM4 SPA.LVO.110 Aerodrome-related requirements, including instrument flight procedures

SUITABLE AERODROMES — ASSESSMENT — PREVIOUS OPERATIONAL DATA PROVIDED BY THE STATE OF THE AERODROME

[...]

(b) The following guidance is provided for the assessment of suitability of aerodromes for LVOs or operations with operational credits:

- (1) If a State provides data related to airports or runways in its territory that are suitable for CAT II or CAT III operations with a specific aircraft model or group of aircraft models, those airports or runways may be considered suitable for the purpose of AMC12 SPA.LVO.110. Note: A CAT II or CAT III approved runway does not necessarily mean that the airport is suitable for the purpose of AMC12 SPA.LVO.110 as the aerodrome's provisions may not ensure that the requirements for certain aircraft models are fulfilled.
- (2) If a State provides data related to airports or runways in its territory that are found suitable for SA CAT I or SA CAT II, those airports or runways may be considered suitable for the purpose of AMC12 SPA.LVO.110. Note: In some States the concept of SA CAT I and SA CAT II may be different from the EU concept. The operator should consider these differences.

[...]

GM7 SPA.LVO.110 Aerodrome-related requirements, including instrument flight procedures

[...]

(f) [...]

- (i) a plan showing contours at 1 m (3 ft) intervals in the area of 60 m on either side of the extended centre line of the runway, to the same distance as the profile, the contours to be related to the runway threshold;
- (ii) an indication where the terrain or any object thereon, within the plan defined in (i), differs by ± 3 m in height from the centre line profile and is likely to affect a radio altimeter;
- (iii) [...]

GM8 SPA.LVO.110 Aerodrome-related requirements, including instrument flight procedures.

SUITABLE AERODROMES — OPERATIONAL ASSESSMENT — PROCESS TO DETERMINE THE NUMBER OF APPROACHES AND LANDINGS — AEROPLANES

[...]

(b) Operational assessment programme: the following guidance provides examples of typical flight programmes that can be used to demonstrate suitability of a landing system using the operational assessment method, considering the overall level of runway irregularities.

[...]

(2) Moderate runway

For moderate runways, a minimum of one successful approach/landing using the procedures, equipment and operationally relevant heights (DH/AH) for the intended operations is performed in the meteorological conditions described in AMC1 SPA.LVO.110 Table 154. More approaches could be required if any issue is identified during this approach/landing.

(3) Complex runway

For complex runways, an initial minimum of three approaches/landings using the procedures, equipment and operationally relevant heights (DH/AH) for the intended operations is performed in the meteorological conditions described in AMC1 SPA.LVO.110 Table 154, with at least one of the landings close to the maximum landing weight for the intended operation and the other two with other different conditions; for example, with a mid-weight in one and low weight in another or with different or wind conditions or aircraft configuration flap full/flap 3, or a combination of them. The flights for the assessment are conducted by pilots designated by the operator with defined minimum experience and

qualifications, with procedures defined for the purpose. More approaches could be required if any issue is identified during these approaches/landings.

(4) Very complex runway

For very complex runways, an initial minimum of four to six approaches/landings using the procedures, equipment and operationally relevant heights (DH/AH) for the intended operations is performed in the meteorological conditions described in AMC1 SPA.LVO.110 Table 154 in typical aircraft weight conditions in flights with no commercial passengers.

[...]

GM9 SPA.LVO.110 Aerodrome-related requirements, including instrument flight procedures

SUITABLE AERODROMES — OPERATIONAL ASSESSMENT — VERIFICATION USING AN FSTD

[...]

(b) [...]

(2) Pre-threshold and runway terrain

The aircraft operator ensures that all relevant pre-threshold and runway profile data is fed into the FSTD and is **representative** ~~representative~~ of the real world. This could mean that additional features may need to be implemented in the terrain database of the FSTD, as the certification specifications for FSTDs require a realistic topography only for a very limited number of aerodromes.

[...]

AMC2 SPA.LVO.120(b) Flight crew competence

INITIAL TRAINING AND CHECKING FOR SA CAT I, CAT II, SA CAT II AND CAT III APPROACH OPERATIONS

[...]

(b) [...]

(3) An abbreviated course should meet the objectives described in (a)(2), **it does not** need ~~not~~ **to** include the number of approaches required by (a)(2)(v), but should include at least the following number of landings: [...]

(c)

(2) [...]

then the flight crew member may complete an abbreviated course of FSTD and/or flight training. Such an abbreviated course should meet the objectives described in (a)(2), **it does not** need ~~not~~ **to** include the number of approaches required by (a)(2)(v), but should include at least the following number of landings.

[...]

AMC3 SPA.LVO.120(b) Flight crew competence

INITIAL TRAINING AND CHECKING FOR EFVS OPERATIONS

[...]

(b) [...]

(2) [...]

then the flight crew member may complete an abbreviated course of FSTD and/or flight training. Such an abbreviated course should meet the objectives described in (a)(2), **it does not need ~~not~~ to** include the number of approaches required by (a)(2)(v), but should include at least the following number of landings: [...]

(c)

(3) Such an abbreviated course should meet the objectives described in (a)(2), **it does not need ~~not~~ to** include the number of approaches required by (a)(2)(v), but should include at least the following number of landings:

[...]

AMC4 SPA.LVO.120(b) Flight crew competence

RECURRENT CHECKING FOR LVTO, SA CAT I, CAT II, SA CAT II AND CAT III APPROACH OPERATIONS

(a) The operator should ensure that the pilots' competence to perform LVOs for which they are authorised is checked by completing at least the following exercises:

(1) One or more low-visibility rejected take-off at minimum approved RVR at least once over the period between two operator proficiency checks or once at every periodic demonstration of competence or, for an ATQP operator, at each required operator proficiency check or alternatively at each required LOE **(i.e. approximately one or more RTO per year)**.

(2) Pilots authorised for LVTO operations in an RVR of less than 150 m should **additionally** conduct at least one LVTO in the minimum approved visibility at each required operator proficiency check or periodic demonstration of competence **(i.e. approximately one or more RTO every semester)**.

[...]

GM1 SPA.LVO.120(b) Flight crew competence

FLIGHT CREW TRAINING

[...]

- (d) Flight crew members are required to complete initial ~~and recurrent~~ FSTD training and maintain recency for each operating capacity for which they will be authorised (e.g. as pilot flying and/or pilot monitoring). A pilot who will be authorised to operate in either capacity will need to complete the minimum number of approaches in each capacity.

[...]

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

DEMONSTRATION OF EQUIVALENT VISUAL ACUITY

- (a) When demonstrating the equivalent visual acuity of the required NVG, the operator should ensure that one of the following conditions are met:
- (1) all required NVG should be of the same make and model;
 - (2) the operator ensures that both:
 - (i) the different NVG meet the same set of specifications (e.g. generation); and
 - (ii) the lowest figure of merit of the different models is no less than 85 % of the higher figure of merit;
 - (3) the operator:
 - (i) analyses the available specifications of the NVG that are considered for compatibility. If, based on the specifications that are available, the different models of NVG appear to be of different generations, they should only be used together on the same flight on a temporary basis, as part of an operator's upgrade to a better generation of NVG;
 - (ii) conducts an operational demonstration to assess the differences in visual acuity of the different models of NVG that are considered for compatibility, in accordance with (b) below;
 - (iii) conducts a risk assessment to determine whether the different models can be used by different crew members on the same flight and under which conditions, in accordance with (c) below.
- (b) The operational demonstration referred to in (a)(3)(ii) above should include the following:
- (1) Environmental conditions. The operational demonstration should take place in all of the following environmental conditions:
 - (i) Full moon and moisture < 70 % relative humidity
 - (ii) At least one lighting condition that is in-between
 - (iii) No moon (e.g. 5 mlux).

- (2) Relevant terrain and lights. The operational demonstration should compare the visual acuity offered by the different NVG for a representative set of terrain and lights under all environmental conditions specified above.
 - (3) Operational environment.
 - (i) The operational demonstration may take place on dedicated non-commercial flights, or during commercial operations if the following conditions are met:
 - (A) On any given flight, all crew members use NVG of the same make and model.
 - (B) Different models of NVG are used on different flights within the same mission.
 - (C) The lighting conditions remain the same within the same mission.
 - (ii) An FSTD should not be used for the operational demonstration.
 - (4) The operator should define the operational demonstration methodology in the operations manual, and should provide to crew members in charge of the assessment an 'operational demonstration sheet', which includes all defined elements to be assessed under all defined light conditions.
 - (5) Crew members in charge of the assessment should have logged at least 100 NVIS flights or 30 hours' flight time under NVIS as a pilot-in-command/commander.
- (c) The risk assessment referred to in (a)(3)(iii) above should consider the following:
- (1) The operator should consider the results of the analysis of the available specifications and the results of the operational demonstration in its risk assessment. The conclusion may be one of the following:
 - (i) The different models of NVG should not be used together on the same flight;
 - (ii) The different models of NVG may be used on the same flight with no restrictions;
 - (iii) The different models of NVG may be used on the same flight with one or more of the following restrictions:
 - (A) The pilot flying uses the best NVG available;
 - (B) On dark nights, a briefing is made on the differences. Dark nights could be defined either as less than 1mLux or be defined by the operator based on the assessment results;
 - (C) Any additional restrictions as defined by the operator.
 - (2) The risk assessment should consider the interchangeability of the NVG available on board, including any NVG of different makes and models, as well as spare NVG.
 - (3) The risk assessment may consider the benefits of upgrading the NVG to a better standard.
 - (i) The duration of the transition to new NVG should be taken into account at operator level.
 - (ii) If the operator has more than one operating base, it may be possible to equip a given operating base with NVG of the same model, whereas another operating base will

have different NVG. In such case the operator should determine the conditions under which the crew changes from one operating base to another.

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

- (d) SOPs. The operator should develop SOPs to comply with any restrictions established in its risk assessment.

DEMONSTRATION THAT DIFFERENT NVG ARE OF THE SAME FILTER CLASS

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

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

DEMONSTRATION OF EQUIVALENT VISUAL ACUITY — SET OF SPECIFICATIONS AND GENERATIONS

- (a) When assessing whether different NVG meet the same set of specifications for the purpose of demonstrating equivalent visual acuity, as described in point (a)(2)(ii) of AMC1 SPA.NVIS.110(e), generations may be defined as per US military specifications or using the following criteria:
- (1) Generation 0 typically uses an S-1 photocathode with peak response in the blue-green region (with a photosensitivity of 60 micro A /lm), electrostatic inversion, and electron acceleration to achieve gain. Consequently generation 0 tubes are characterised by the presence of geometric distortion and the need for active infrared illumination.
 - (2) Generation 1 typically uses an S-20 photocathode (with a photosensitivity of 180-200 micro A /lm), electrostatic inversion, and electron acceleration to achieve gain. Because of higher photo-sensitivity, generation 1 was the first truly passive image intensifier. Generation 1 is characterised by the presence of geometric distortion, low performance at low light level and blooming.
 - (3) Generation 2 typically uses an S-25 photocathode (extended red, with a photosensitivity of 240 micro A /lm or more), and a microchannel to achieve gain. Generation 2 tubes provide satisfactory performance at low light levels and low distortion.
 - (4) Generation 3 uses gallium-arsenide for the photocathode (photosensitivity of 800+ micro A /lm in the near infrared) and a micro-channel plate for gain. The microchannel is coated with an ion barrier film to increase tube life. Generation 3 has very good to excellent performance at low light level. Recent models have no perceptible distortion.

- (b) NVG of 'generation 3 autogated' or 'generation 3+' as defined by the US military are sometimes called 'generation 4' commercially. The differences with generation 3 are limited to the following and are therefore considered not to be significant. Generations 3 to 4 as mentioned above may be considered to be the same generation.
 - (1) they are autogated, therefore more robust to high illumination and abrupt changes of the illumination level
 - (2) they are unfilmed, which gives less image noise
- (c) A non-civilian set of specifications — other than generations — that ensures sufficient equivalent visual acuity may also be used. For example, OMNI specifications from the US military may be used.
- (d) The figure of merit is resolution * signal to noise ratio.

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

THE HERMS PHILOSOPHY

(a) Introduction

This GM outlines the HERMS 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 HERMS and air ambulance - in regulatory terms. It also discusses the application of operations to public interest sites in the HERMS context.

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

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

[...]

(c) [...]

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

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

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

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

(e) Air ambulance

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

[...]

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 without a medical condition is endangered by the environment, then a helicopter may be needed. Such danger may arise, for instance, from temperature, wind, or snow. The same principles as for air ambulance operations should apply when the person's life is not immediately endangered by the situation, however action is required. In that case, 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.

(f) [...]

(g) [...]

(2) [...]

(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) [...]

(gh) Problems with hospital sites are 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) [...]

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

HEMS OPERATIONS AT NIGHT WITHOUT NVIS

- (a) A pre-surveyed HEMS operating site is a site that has been surveyed by day, is included in an operator's operating site directory, and is re-surveyed on a regular basis as per AMC1 CAT.OP.MPA.105.
- (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.

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

HEMS HEC CARGO SLING OPERATIONS

TECHNICAL CREW MEMBERS AND GROUND OPERATIONS PERSONNEL

- (a) During HEMS HEC cargo sling operations, the operator should ensure that a trained crew member, referred to as the sling technical 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) The operator should ensure that the person securing themselves or other persons to the rope is trained in accordance with ORO.GEN.110(e). This person should be nominated by the operator or should be part of an external organisation contracted by the operator. If the person is a member of an external organisation, ORO.GEN.205 applies. This person may be a sling technical crew member.
- (c) The sling technical crew member may be the HEMS technical crew member if the training and checking requirements for both roles are met.
- (d) The sling technical crew member and the person responsible to secure themselves or other persons to the rope, referred to in (b) should comply with the training, checking and briefing defined for task specialists in point (e) of AMC1 SPO.SPEC.HEC.100.

EQUIPMENT

- (e) The sling technical crew member and the person responsible to secure themselves or other persons to the rope referred to in (b) should be equipped with communication equipment and personal protective equipment meeting the criteria of point (c)(4) of AMC1 SPO.SPEC.HEC.100. The helicopter should be equipped in accordance with point (c)(3) of AMC1 SPO.SPEC.HEC.100.
- (f) When conducting single-pilot vertical reference operations with no assistance of a crew member, additional engine monitoring in the pilot line of vision or an audio warning system is recommended.

FLIGHT CREW

- (g) A pilot involved in HEMS HEC cargo sling operations should be trained and experienced as defined in points (b) and (d) of AMC1 SPO.SPEC.HEC.100.
- (h) A pilot involved in HEMS HEC cargo sling operations should complete a flight check at least annually to demonstrate competence in carrying out HEMS HEC operations. The checking may be combined with the line check or with a HEC training flight. If the operator is involved in HEMS HEC cargo sling operations by night, the flight check should take place by night.
- (i) A pilot involved in HEMS HEC cargo sling operations should have completed in the last 90 days:
- (1) when operating by day: any combination of three day or night cycles, each of which shall include a transition to and from the hover;
 - (2) when operating by night: three night cycles, each of which shall include a transition to and from the hover.
- Cycles may include HEMS HEC cargo sling cycles, SPO.SPEC.HEC cycles, SPO.SPEC.HESLO cycles or hoist cycles.
- (j) In the context of HEMS, the validity period of flight and technical crew recurrent training and checking as well as recency should be as specified in AMC1 ORO.FC.145(g).

SOPs

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

GM1 SPA.HEMS.105(b) HEMS HEC operations

HEMS OPERATING SITES USED FOR TRAINING AND CHECKING

In order to ensure that the training and checking is relevant to the duties of the crew members and ground personnel as required by ORO.GEN.110(e), the operator may define HEMS operating sites for the purpose of the HEMS training and checking required in SPA.HEMS.105(b), except for the initial part of the training.

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

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

AIRWORTHINESS APPROVAL FOR THE CARGO HOOK

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

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

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

MOVING MAP DISPLAYS

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

- (a) an HTAWS that is airworthiness approved;
- (b) a display that is integrated in the cockpit environment and is airworthiness approved;
- (c) a type B EFB software application.

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

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

MOVING MAPS — TRAINING

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

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

- (a) Not all terrain and obstacles will be included in the database.
- (b) In VFR, the proper selection of altitude and efficient visual scanning of the environment remain the primary means of obstacle and terrain avoidance.
- (c) A type B EFB software application can only be used for increased situational awareness.

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

SHORT EXCURSIONS ABOVE 13 000 FT WITHOUT OXYGEN

- (a) SPA.HEMS.110(d)(3) limits the duration of excursions above 10 000 ft without oxygen to 30 minutes within a HEMS mission, this being the maximum limit. However, the operator should consider further limiting the duration of the excursion depending on the concrete maximum flight altitude. For that purpose, the operator should meet either of the following:

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

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

Table 1 — Maximum duration of the excursion above 10 000 ft, based on the maximum altitude reached

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

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

SHORT EXCURSIONS ABOVE 13 000 FT WITHOUT OXYGEN

- (a) The duration of the excursion includes all time spent above 10 000 ft during the HEMS mission. This includes:
- (1) all time spent on ground above 10 000 ft;
 - (2) all time spent in flight above 10 000 ft within a single HEMS mission.
- (b) The HEMS mission ends on return to base. Temporarily flying below 10 000 ft without returning to base does not reset the duration of the excursion.

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

SHORT EXCURSIONS ABOVE 13 000 FT WITHOUT OXYGEN

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

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

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

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

HYPOXIA TRAINING

- (a) Required crew members planning to fly above 13 000 ft without oxygen should have training aimed at the following:
- (1) knowing themselves and identifying early signs of hypoxia; and
 - (2) recognising early signs of hypoxia in other crew members.
- (b) The crews should undergo both theoretical and practical training.
- (c) The theoretical training should take place every 3 years and should include the learning objectives of module 050 of the CPL/ATPL theoretical knowledge that are relevant to hypoxia, as defined in Annex I (Part-FCL) to Regulation (EU) No 1178/2011¹.
- (d) The initial and recurrent practical training of (a)(1) should take place every 6 years and should take place in one of the following:
- (1) a hypobaric chamber that simulates an altitude for a sufficient duration for hypoxia to occur in an oxygen-deprivation scenario that is representative of a helicopter mission;
 - (2) a device that ensures that the gas the trainee breathes has the same partial pressure of oxygen as at the desired altitude, for a sufficient duration for hypoxia to occur in an oxygen-deprivation scenario that is representative of a helicopter mission. (e.g. reduced oxygen breathing device);
 - (3) a helicopter at the altitude required for the individual trainee to experience hypoxia, for the recurrent training only, provided that the trainee is in the cabin with medical assistance and an instructor using oxygen is able to ensure the safety of the training.
- (e) The initial and recurrent practical training of (a)(2) should take place every 6 years and should comply with one of the following:
- (1) The trainee should not be deprived of oxygen and should observe another crew member that undergoes the training described in (d) and that becomes hypoxic;
 - (2) The training takes place in a helicopter / FSTD where the instructor plays the role of a hypoxic crew member. The instructor should have attended at least 6 training sessions described under (d) as an observer or instructor or active crew member. In this case, neither the trainee nor the instructor need to be deprived of oxygen.
- (f) In the context of hypoxia training, the validity period of flight and technical crew recurrent training should be as specified in AMC1 ORO.FC.145(g).

¹ Commission Regulation (EU) No 1178/2011 of 3 November 2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 311, 25.11.2011, p. 1) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011R1178>).

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

SUITABLE STABILITY AUGMENTATION SYSTEM (SAS) OR AUTOPILOT

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

- (a) Pitch rate damping and attitude / attitude rate stabilisation;
- (b) Roll rate damping and attitude / attitude rate stabilisation; and
- (c) Yaw damping.

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

AUTOPILOT

The autopilot should have at least the following functions:

- (a) Attitude hold;
- (b) Altitude hold mode; and
- (c) Heading hold mode.

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

HEMS VFR MINIMA: CEILING, CLOUD BASE AND VISIBILITY

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

Table 1 — HEMS operating minima

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

(*) During the en-route phase, visibility may be reduced to 800 m for short periods when in sight of land if the helicopter is manoeuvred at a speed that will give adequate opportunity to observe other traffic or any obstacles in time to avoid a collision.

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

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

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

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

Table 2 — Reduced HEMS operating minima when instructed to ‘proceed VFR’ following an IFR approach

DAY		
	Visibility	Ceiling
$x \leq 1\,500\text{ m}$	x but at least 800 m	MDH
$x > 1\,500\text{ m}$	1 500 m	MDH or 300 ft (*)
NIGHT		
	Visibility	Ceiling
$x < 2\,000\text{ m}$	$x + 500\text{ m}$ but at least 1 500 m	MDH
with NVIS: $2\,000 \leq x < 5\,000\text{ m}$	2 500 m	MDH or 400 ft (*)
no NVIS: $2\,000 \leq x < 5\,000\text{ m}$	$x+500$ or 3 000 m whichever is lower	MDH or 500 ft (*)

x is the distance between the missed approach point (MAPt) and the heliport or operating site

(*) whichever is higher

Table 3 — Reduced HEMS operating minima when instructed to ‘proceed VFR’ prior to an IFR departure

DAY		
	Visibility	Crossing height at IDF
$x \leq 3\,000\text{ m}$	800 m	Crossing height at IDF
$3\,000\text{ m} < x \leq 5\,000\text{ m}$	1 500 m	Crossing height at IDF
NIGHT		
	Visibility	Ceiling
$x < 2\,500\text{ m}$	x but at least 1 500 m	Crossing height at IDF
with NVIS: $2\,500 \leq x < 5\,000\text{ m}$	2 500 m	Crossing height at IDF
no NVIS: $2\,500 \leq x < 5\,000\text{ m}$	x or 3 000 m whichever is lower	Crossing height at IDF

x is the distance between the heliport or operating site and the initial departure fix (IDF)

HEMS VFR OPERATING MINIMA: VERTICAL DISTANCE TO OBSTACLES

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

- (1) the minimum safe cruising height(s) for the area(s) overflown, the minimum distance to obstacles and, when necessary, the appropriate maximum helicopter speed(s);
- (2) the minimum safe height (safety height) over relevant obstacles in the flight path during the cruise phase for VFR operations, which should not be less than 200 ft during the day and 500 ft during the night.

GM1 SPA.HEMS.120 HEMS operating minima

REDUCED VISIBILITY

- (a) ~~In the rule the~~ The ability to reduce the visibility for short periods ~~has been included. This~~ will allow the commander to assess the risk of flying temporarily into reduced visibility against the need to provide emergency medical service, taking into account the advisory speeds included in Table 1. Since every situation is different it was not felt appropriate to define the short period in terms of absolute figures. It is for the commander to assess the aviation risk to third parties, the crew and the aircraft such that it is proportionate to the task, using the principles of GM1 SPA.HEMS.100(a).

[...]

GM2 SPA.HEMS.120 HEMS operating minima

HEMS TRAINING MINIMA

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

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

HEMS VFR OPERATING MINIMA: MISCELLANEOUS

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

AMC1 SPA.HEMS.120(d c)(2) HEMS operating minima

TASKS AND QUALIFICATION OF THE HEMS TECHNICAL CREW MEMBER

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

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

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

CRASH-RESISTANT FUEL SYSTEMS

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

- (a) FAR 27.952(a)(1)(2)(3)(5)&(6), FAR 27.952.(f), and FAR 27.963(g) at Amendment 27-30 of 2 November 1994 or any subsequent amendment;
- (b) FAR 29.952(a)(1)(2)(3)(5)&(6), FAR 29.952(f), and FAR 29.963(b) at Amendment 29-35 of 2 November 1994 or any subsequent amendment;
- (c) JAR 27.952(a)(1)(2)(3)(5)&(6), JAR 27.952.(f), and JAR 27.963(g) Change 0 of 6 September 1993 or any subsequent amendment;
- (d) JAR 29.952(a)(1)(2)(3)(5)&(6), JAR 29.952(f), and JAR 29.963(b) change 0 of 5 November 1993 or any subsequent amendment.

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

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

CRASH-RESISTANT FUEL SYSTEMS

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

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

[...]

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

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

- (a) If a stretcher is likely to be necessary for the mission, the helicopter should be able to carry a deployed stretcher without preventing compliance with the crew composition requirements of SPA.HEMS.130, i.e. without preventing the two pilots, or a pilot and a HEMS crew member, from occupying the two forward-facing seats in the cockpit.
- (b) Considering the limitations for Performance class 3 operations included in CAT.POL.H.400, the planned mission needs to remain outside congested hostile areas and is expected to be completed by sunset.
- (c) If the HEMS mission unexpectedly needs to be continued by night, or it unexpectedly requires a HEMS flight into a congested hostile area, the operator should ensure that a category A helicopter is dispatched.
- (d) The records required by point (vi) of SPA.HEMS.125(a)(3) should contain the following information for each mission, and be kept for 3 years:
 - (1) the criteria that the operator used for the dispatch in accordance with SPA.HEMS.125 (a)(3);
 - (2) the criteria that the operator used for the dispatch as described in (a) and (b) above;
 - (3) the contingency options that were available to meet (c), and whether they were triggered or not;
 - (4) all elements relevant to the mission including destinations, altitude, weather conditions, mass and balance.

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

TAKE-OFF AND LANDING PERFORMANCE — HEMS OPERATING SITES USED FOR TRAINING AND CHECKING

The operator's risk assessment required under CAT.POL.H.305(b)(1) may take into consideration the following elements pertaining to take-off and landing performance when defining such HEMS operating sites, for the purpose of compliance with SPA.HEMS.125(c)(3)(ii):

- (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.

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

CRITERIA FOR THE HEMS OPERATING SITE DIMENSIONS

- (a) ~~When selecting~~ In order to select a HEMS operating site from the air, the operator should define either: ~~it should~~
 - (1) minimum HEMS operating site dimensions of at least $2 \times D$ by day (the largest dimensions of the helicopter when the rotors are turning) and at least $4 \times D$ in length and $2 \times D$ in width by night, to be estimated by the crew from the air; or ~~have a minimum dimension of at least $2 \times D$ (the largest dimensions of the helicopter when the rotors are turning). For night operations, unsurveyed HEMS operating sites should have dimensions of at least $4 \times D$ in length and $2 \times D$ in width.~~
 - (2) alternative criteria for the HEMS operating site together with operating procedures and training, which mitigate the risks identified in the operator's risk assessment. In this case the operator may choose not to define minimum site dimensions. By night, for operations other than HEC, the HEMS operating site should include an area that the crew estimates to be at least $4 \times D$ in length and $2 \times D$ in width, which should be free of relevant obstacles.
- ~~(b) — For night operations, the illumination may be either from the ground or from the helicopter.~~
- (b) The pre-surveyed HEMS operating site dimensions should be at least $2 \times D$.
- (c) The operator may provide guidelines to its commanders on whether to land, proceed with e.g. a one-skid landing, hover landing or proceed with HEMS HEC operations. The commander should decide which technique to employ.
- (d) Before operating at a HEMS operating site, the commander should estimate whether it is suitable for safe operations based on the above and on the environmental conditions.

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

ILLUMINATION OF HEMS OPERATING SITES AT NIGHT

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

- (a) identify the landing area in flight and determine the landing direction; and
- (b) make a safe approach, landing and take-off.

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

ILLUMINATION OF HEMS OPERATING SITES AT NIGHT

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

AMC1 SPA.HEMS.130 Crew requirements

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

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

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 a pilot-in-command/commander of aircraft, of which 500 hours are as a pilot-in-command/commander on helicopters; or
 - (2) 1 000 hours as a co-pilot in HEMS operations of which at least 500 hours are as a pilot-in-command under supervision, and 100 hours as a pilot-in-command/commander on helicopters;
- (b) 500 hours' operating experience in helicopters, gained in an operational environment similar to that of the intended operation;

- (c) for pilots engaged in restricted night operations that do not include landing at night at HEMS operating sites, 20 hours of VMC at night as a pilot-in-command/commander; and
- (d) for pilots engaged in unrestricted night operations:
 - (1) 30 hours of VMC at night, to which 3 hours may be credited for every hour flown as part of a structured night HEMS training programme on a suitable FSTD. The structured training programme may be part of the operator conversion course or command course of the HEMS operator. This experience comes in addition to point (c);
 - (2) 10 approaches, landings and take-offs by night at operating sites in an operational environment similar to that of the intended operation in the helicopter or in a FFS level D.

AMC1 SPA.HEMS.130(b)(2) – Crew requirements

EXPERIENCE

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

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.

FLIGHT TRAINING WITH SOLE REFERENCE TO INSTRUMENTS

- (a) The flight training should include training as pilot flying with sole reference to instruments.
- (b) The training duration should be at least 45 minutes.
- (c) The training should be conducted by a(n) FI/TRI/SFI and should be sufficient for the pilot to demonstrate competence in recovery from inadvertent entry into IMC conditions including the following manoeuvres:
 - (1) transition to instrument flight during climb-out;
 - (2) climbing and descending turns on to specified headings;
 - (3) level flight, control of heading, altitude and speed;
 - (4) level turns with 30 degrees bank, 180 to 360 degrees left and right;
 - (5) recovering from unusual attitudes;
 - (6) emergency let-down procedures;
 - (7) with a validity period of 12 calendar months, use of the autopilot including upper modes, if fitted.

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

AMC1 SPA.HEMS.130(e) Crew requirements

HEMS TECHNICAL CREW MEMBER

- (a) When the crew is composed of one pilot and one HEMS technical crew member, the latter should be seated in the forward-facing front seat (co-pilot seat) during the flight, ~~so as to be able to carry out his/her primary task of assisting the commander in:~~

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

- (1) the HEMS technical crew member is likely to be tasked with HEMS HEC duties from the cabin during the HEMS mission;
- (2) the flight is conducted to or from a HEMS operating site;
- (3) the operator's risk assessment determines that the technical crew member can carry out their primary tasks from the cabin; this risk assessment may determine that the rear door(s) needs (need) to remain open for better visibility.

In addition, both by day and by night, the HEMS technical crew member may also re-position from the front seat to the cabin and back in the hover phase at the HEMS operating site used for HEMS HEC, if conditions (a)(1) to (a)(3) and all the following additional conditions are met:

- (4) the risk assessment determines that the technical crew member can safely move from one position to the other;
- (5) the helicopter is so equipped that the repositioning does not result in inadvertent interference with flight controls or aircraft systems;
- (6) the operator defines SOPs for the transitioning to unaided visual references prior to entering the hover phase and for the re-positioning of the crew member;
- (7) the operator defines initial and recurrent training towards these SOPs as well as recency requirements for technical crew members involved; and for night operations the training takes place by night;
- (8) for night operations, the operator defines criteria to determine whether the HEC operation takes place with sufficient visual references at pre-flight stage and on-site. Sufficient visual references should be considered not to be met in the context of offshore operations;
- (9) by night, the commander determines whether the pre-flight criteria defined in (8) are likely to be met without the use of NVG, and on-site, whether the criteria are met without the use of NVG. The commander should only use the procedure if the criteria are met.

- (b) The primary tasks of the HEMS technical crew members are to assist the commander in:
- (1) collision avoidance;
 - (2) the selection of the landing site; ~~and~~
 - (3) the detection of obstacles during approach and take-off phases; ~~and~~
 - (4) the reading of checklists when seated in the front seat.
- (bc) The commander may delegate other aviation tasks to the HEMS technical crew member, as necessary:
- (1) assistance in navigation;
 - (2) assistance in radio communication/radio navigation means selection;
 - (3) if properly qualified and licensed, radio communications;
 - ~~(34)~~ reading of checklists from the cabin; and
 - ~~(45)~~ monitoring of parameters.
- (ed) 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.).
- (ee) There may be exceptional circumstances when it is not possible for the HEMS technical crew member to carry out their his/her primary task as defined under (ba).
- 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.)
- (ef) 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) When selecting flight crew in accordance with SPA.HEMS.130(a), for single-pilot operations the operator should consider the experience of both the pilot and the technical crew member.
- (1) The operator should consider that a HEMS technical crew member is inexperienced until he or she has completed 50 HEMS missions. The operator may include HEMS missions flown during line flying under supervision.
 - (2) When an inexperienced HEMS technical crew member is part of the crew, the following should apply:
 - (i) 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
 - (ii) the pilot has achieved 100 flight hours on the type since the completion of the operator's conversion course on the type.

- (3) A smaller number of flight hours or missions than those defined in (1) or (2) 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:
- (i) a new operator commences operations;
 - (ii) an operator introduces a new helicopter type;
 - (iii) the pilot has previously completed a type conversion course with the same operator (reconversion);
 - (iv) credits are defined in the operational suitability data established in accordance with Commission Regulation (EU) No 748/2012².

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

REDUCTION OF THE CREW COMPOSITION — SINGLE-PILOT OPERATIONS WITH NO TECHNICAL CREW MEMBER

- (a) The commander should decide whether he or she needs the assistance of a technical crew member, or if the technical crew member can be relieved from flight duties to provide medical assistance from the cabin or on site.
- (b) When relieved from flight duties at a HEMS operating site, the technical crew member should take part in the departure briefing that summarises the relevant obstacles and threats.

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

~~SPECIFIC GEOGRAPHICAL AREAS~~

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

² Commission Regulation (EU) No 748/2012 of 3 August 2012 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations (OJ L 224, 21.8.2012, p. 1) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32012R0748&qid=1685708987266>).

~~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.~~

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;
- [...]
- (b) **Single-pilot operations**
- (1) **The flight crew training syllabus should include initial and annual recurrent helicopter/FSTD training focusing on crew cooperation with the technical crew member.**
 - (2) **The initial training should include at least 4 hours flight instruction dedicated to crew cooperation unless:**
 - (i) **the pilot holds a certificate of satisfactory completion of a multi-crew cooperation course in accordance with Commission Regulation (EU) No 1178/2011³; or**
 - (ii) **the pilot has at least 500 hours in either multi-pilot operations or single-pilot operations with a HEMS or equivalent technical crew member, or a combination of these.**
 - (3) **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 (1) and (2) should be conducted by a suitably qualified commander with a minimum experience of 350 hours in either multi-pilot operations or single-pilot operations with a HEMS technical crew member, or a combination of these.**
- (bc) 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:

³ Commission Regulation (EU) No 1178/2011 of 3 November 2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 311, 25.11.2011, p. 1) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011R1178>).

[...]

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

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

(vii) crew cooperation.

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

~~(1) — duties in the HEMS role;~~

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

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

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

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

~~(6) — instrument reading, warnings, use of normal and emergency checklists in assistance of the pilot as required;~~

~~(7) — basic understanding of the helicopter type in terms of location and design of normal and emergency systems and equipment;~~

~~(8) — crew coordination;~~

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

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

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

~~(12) — techniques for handling patients, the medical consequences of air transport and some knowledge of hospital casualty reception;~~

~~(13) — marshalling signals;~~

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

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

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

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

GM1 SPA.HEMS.130(e)(3) Crew requirements

CONTINUITY OF THE CREW CONCEPT

The crew concept includes the operator's normal crew composition and variations to it that the operator accepts that will occur during the HEMS mission. The operator ensures the continuity of the crew concept by managing these variations.

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

HEMS TECHNICAL CREW MEMBER TRAINING AND CHECKING SYLLABUS

INITIAL AND RECURRENT TRAINING COVERING PRIMARY TASKS

(a) The HEMS technical crew member initial and recurrent training and checking syllabus required by SPA.HEMS.130(f)(1) and covering primary tasks as defined in point (b) of AMC1 SPA.HEMS.130(e), and tasks required by the operator's refuelling procedure in compliance with SPA.HEMS.155, and meeting the objectives of points (e)(3) and (f)(2) of SPA.HEMS.130 should include the following items:

- (1) Applicable laws and regulations;
- (2) Helicopter general knowledge:
 - (i) stowage, cabin safety and use of on-board medical equipment;
 - (ii) general knowledge of helicopter operations;
- (3) Meteorology;
- (4) Operational procedures:
 - (i) company procedures;
 - (ii) duties in the HEMS role;
 - (ii) response to HEMS dispatch;
 - (iii) HEMS operating site selection and use;
 - (iv) patients;
 - (v) portable electronic devices and electronic flight bags, as applicable;
- (5) Crew coordination including checklists;
- (6) Human performance and limitations, CRM;
- (7) Flight safety:
 - (i) general flight safety in helicopter operations;
 - (ii) obstacle and traffic clearance;
 - (iii) handling of abnormal and emergency situations including checklists;

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

(8) Security.

NAVIGATION TRAINING

(b) If the HEMS technical crew member is tasked to provide assistance in navigation, as defined in AMC1 SPA.HEMS.130(e), points (c)(1) and (c)(2), the initial and recurrent training and checking syllabus should also include the following items:

- (1) applicable parts of SERA, as relevant to the navigation tasks of the HEMS crew member;
- (2) basic navigation training;
- (3) navigation aid principles and use;
- (4) airspace, restricted areas, and noise-abatement procedures;
- (5) crew coordination.

COMMUNICATION TRAINING

(c) If the HEMS technical crew member is tasked to provide assistance in radio communications as defined in AMC1 SPA.HEMS.130(e), points (c)(2) and (c)(3), the initial and recurrent training and checking syllabus should also include the following items:

- (1) operation of relevant radio equipment;
- (2) crew coordination.

MONITORING TRAINING

(d) If the HEMS technical crew member is tasked to provide assistance in monitoring the flight path and instruments as defined in AMC1 SPA.HEMS.130(e), point (c)(5), the initial and recurrent training and checking syllabus should also include the following items:

- (1) general knowledge of helicopter operations;
- (2) monitoring function;
- (3) crew coordination;
- (4) handling of abnormal and emergency situations, as applicable.

GROUND CREW TRAINING

(e) If the HEMS technical crew member is tasked to provide assistance to the helicopter on the ground as defined in AMC1 SPA.HEMS.130(e), point (d), the initial and recurrent training and checking syllabus should also include the following items as applicable to their tasks:

- (1) safety and security at the HEMS operating site;
- (2) the dangers to self and others of rotor running helicopters, including loading of patients;
- (3) preparing the helicopter and specialist medical equipment for subsequent HEMS departure;
- (4) conducting refuelling, and conducting refuelling with rotors turning;

- (5) marshalling signals;
- (6) safety on the aerodrome/operating site, including fire prevention and ramp safety areas;
- (7) towing of helicopter/trolley.

ADDITIONAL TRAINING (AS APPROPRIATE)

- (f) The initial and recurrent training and checking syllabus should also include the following items as relevant to the operations:
 - (1) HEMS HEC cargo sling operations, as defined in AMC1 SPA.HEMS.105(b);
 - (2) hoist operations, as defined in SPA.HHO;
 - (3) NVIS, as defined in SPA.NVIS;
 - (4) IFR/PBN.

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

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

INITIAL AIRCRAFT/FSTD TRAINING

- (i) The technical crew member training syllabus should include helicopter/FSTD training focusing on crew cooperation with the pilot.
 - (1) The initial training should include at least 4 hours instruction dedicated to crew cooperation unless:
 - (i) the HEMS crew member has undergone this training under another operator; or
 - (ii) the HEMS crew member has performed at least 50 missions in HEMS or equivalent role as a technical crew member.
 - (2) The training described in (1) above should be organised with a crew composition of one pilot and one technical crew member.
 - (3) The training may be combined with the line flying under supervision.

LINE FLYING UNDER SUPERVISION

- (j) Line flying under supervision
 - (1) Line flying under supervision should take place during the operator's conversion course.
 - (2) Line flights under supervision provide the opportunity for a HEMS technical crew member to practise the procedures and techniques he or she should be familiar with, regarding ground and flight operations, including any elements that are specific to a particular helicopter type. Upon completion of the line flying under supervision, the HEMS technical

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

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

RECURRENT AIRCRAFT/FSTD TRAINING

(k) Recurrent helicopter/FSTD training

- (1) The recurrent training should focus on crew cooperation and include a minimum of 2 hours of flight.
- (2) The training described in (1) above should take place in the same conditions as the initial training in (i) above.
- (3) The validity period of the aircraft/FSTD training should be 12 calendar months.

LINE CHECKS

(l) Line checks

- (1) The line check should be performed during a HEMS mission. If practically necessary, because of the difficulty to anticipate an actual HEMS activity or a cabin layout or helicopter performance making it difficult to carry an extra person, a helicopter flight representative of a HEMS mission may be carried out for the purpose of the line check.
- (2) The operator's conversion course should include a line check. The line check should take place after the completion of the line flying under supervision.
- (3) Any task-specific items may be checked by a suitably qualified HEMS technical crew member nominated by the operator and trained in CRM concepts and the assessment of non-technical skills.

OPERATOR PROFICIENCY CHECKS

(m) Operator proficiency checks

- (1) The HEMS technical crew member should complete an operator proficiency check to demonstrate his or her competence in carrying out normal, abnormal and emergency procedures, covering the relevant aspects associated with the flight operational tasks described in the operations manual and not already covered in the line check.
- (2) The conversion course should include an operator proficiency check.
- (3) The operator proficiency check should be valid for a given helicopter type. In order to consider an operator proficiency check to be valid for several helicopter types, the operator should demonstrate that the types are sufficiently similar from the technical crew member's perspective.

PROVISION OF TRAINING AND CHECKING

(n) Use of FSTDs

- (1) The line check and line flying under supervision should be performed in the helicopter.
- (2) Notwithstanding (1), the operator may perform the line check in two parts, in a suitable FSTD and on ground, if all of the following conditions are met:
 - (i) The FSTD part of the line check takes place in a line-oriented evaluation;
 - (ii) The ground part of the line check takes place at the HEMS operating base and includes all normal operating procedures not checked in the FSTD;
 - (iii) Both parts of the line check are conducted within 3 months of each other;
 - (iv) For the purpose of AMC1 SPA.HEMS.130, the line check is considered to be performed on the day when the last part of the line check is completed;
 - (v) For the purpose of (ii), the operator should arrange to replicate realistic conditions as much as practicable, so that normal operating procedures that take place on ground at the HEMS operating site are also checked.
- (3) Operator proficiency checks and aircraft/FSTD training should be performed in an suitable FSTD or, if it is not reasonably practicable to gain access to such devices, in an aircraft of the same type.
 - (o) Emergency and safety equipment training should be performed in a representative training device or in an aircraft of the same type.
 - (p) The type of equipment used for training and checking should be representative of the instrumentation, equipment and layout of the aircraft type operated by the crew member.
 - (q) Training and checking in the aircraft/FSTD should take place as part of the normal crew complement.
 - (r) The person conducting the training and checking should be a suitably qualified commander nominated by the operator. In the case of the training described in (i)(1) and (k)(1) above, the person conducting the training should have a minimum experience of 350 hours in either multi-pilot operations or single-pilot operations with a HEMS technical crew member or a combination of these. The person conducting a CRM assessment should be trained in CRM concepts and the assessment of CRM skills.
 - (s) Notwithstanding (r), the person conducting the training and checking of tasks conducted in the cabin where crew cooperation is not essential may be a suitably qualified technical crew member nominated by the operator.

CRM ASSESSMENT OF THE HEMS TECHNICAL CREW MEMBER

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

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

HERMS TECHNICAL CREW MEMBER THEORETICAL TRAINING

- (a) The HERMS technical crew member training and checking syllabus required by SPA.HERMS.130(f)(1) may be adapted to the knowledge of the technical crew member and structured as shown in Table 1.

Table 1 — HEMS technical crew member training

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

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

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

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

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

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

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

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

(2) Basic navigation training:

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

(ii) measuring distances and courses;

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

(iv) moving map if applicable;

(v) identification of obstacles and conflicting terrain;

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

(vii) units and unit conversion;

(3) Principles and use of navigation aids:

(i) navigation equipment and AFCS operations as applicable;

(ii) transponder;

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

(iv) inadvertent IMC;

(4) Airspace, restricted areas, and noise-abatement procedures:

(i) air traffic services;

- (ii) aerodrome procedures;
 - (iii) AIP;
 - (iv) NOTAMS;
- (5) Crew coordination: assignment of navigation tasks.
- (c) The operator may consider that trainees that have passed the theoretical knowledge examination for at least PPL(A) or PPL(H) or that hold at least a PPL(A) or PPL(H) licence do not require additional navigation training. In all other cases, if the HEMS technical crew member is tasked to provide assistance in radio communications, the radio communications training may be structured as follows:
- (1) Operation of relevant radio equipment: radio licence as applicable to the frequencies used by the technical crew member
 - (2) Crew coordination: effective use of radio communication system
- (d) If the HEMS technical crew member is tasked to provide assistance in monitoring, the training towards monitoring may be adapted to the knowledge of the technical crew member and structured as shown in Table 2.

Table 2 — HEMS technical crew member monitoring training

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

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

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

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

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

- (1) introduction to IFR operations covering IFR parts of the operations manual, including MEL
- (2) applicable parts of SERA
- (3) human performance and limitations
- (4) navigation sources, charts, and procedures
- (5) navigation equipment and AFCS operations as applicable
- (6) flight instrument systems
- (7) ACAS, HTAWS, weather radar, moving map as applicable
- (8) air traffic control
- (9) meteorology as relevant to the operating area
- (10) flight planning

- (f) If the HEMS technical crew member is tasked to provide assistance on the ground or is involved in operations under a specific approval, the training towards these tasks may be structured as in AMC2 SPA.HEMS.130(f)(1).

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, as part of the detailed training syllabus defined in SPA.HEMS.130(f)(1).

GM3 SPA.HEMS.130(f)(1) Crew requirements

USE OF HEMS OPERATING SITES FOR TRAINING AND CHECKING

In order to ensure that the training and checking is relevant to the duties of the crew members and ground personnel as required by ORO.GEN.110(e), the operator may define HEMS operating sites for the purpose of the HEMS training and checking required in SPA.HEMS.130, including training for HEMS HEC operations, except for the initial part of the training.

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

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

GROUND EMERGENCY SERVICE PERSONNEL

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

[...]

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

GROUND EMERGENCY SERVICE PERSONNEL

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

(1) Definitions: List applicable definitions and abbreviations.

(2) Helicopter(s):

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

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

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

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

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

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

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

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

(vi) Describe light on skid/wheel;

(vii) Describe HHO or HEC with cargo sling;

(viii) Describe ground to helicopter signals;

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

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

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

(1) Establish communication;

(2) Select operating site;

- (3) Secure the operating site (public/bystanders/crowd control/obstacles/loose objects); and
 - (4) Communicate with the helicopter the position of/how to identify the operating site, weather, and hazards.
- (c) It is advantageous if operators in the same operating area collaborate when developing checklists and when describing items covered in AMC1 SPA.HEMS.135(b).

AMC1 SPA.HEMS.140 Information, procedures and documentation

OPERATIONS MANUAL

The operations manual should include all of the following:

[...]

- (g) the safety altitude for the area overflown; ~~and~~
- (h) abnormal procedures including procedures to be followed in case of inadvertent entry into cloud;
- (i) operational dispatch criteria;
- (j) a description of the crew composition for all phases of flight and conditions, standard operating procedures for the described crew composition including any procedures to ensure the continuity of the crew concept;
- (k) flight crew and technical crew training and checking syllabi, as required by SPA.HEMS.130.

AMC2 SPA.HEMS.140 Information, procedures and documentation

HEMS RISK ASSESSMENT

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

- (a) adequate ground reference;
- (b) reliability of weather reporting facilities;
- (c) crew composition, minimum crew qualification, initial and recurrent training;
- (d) flight time limitations and crew fatigue;
- (e) operating procedures, including crew coordination;
- (f) weather minima;
- (g) equipment of the helicopter;
- (h) additional considerations due to specific local conditions.

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

HEMS TACTICAL RISK ASSESSMENT — SPECIFIC RISKS ASSOCIATED WITH THE HEMS MISSION

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

The following may be considered:

- (a) operating environment, including airspace and local geography;
- (b) weather;
- (c) NOTAMs;
- (d) performance;
- (e) aircraft, equipment and defects, MEL, and medical equipment;
- (f) fuel planning;
- (g) crew fatigue, recency and qualifications;
- (h) dispatch criteria;
- (i) tasking, roles and responsibilities;
- (j) in-flight replanning;
- (k) for NVIS, the elements in GM4 SPA.NVIS.130(f); and
- (l) relevant threats.

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

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

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

- (a) meteorological information from a certified service provider at the operating base;
- (b) meteorological information from a certified service provider at an aerodrome or location where the operator determines that local meteorological conditions are likely to be similar to that of the operating base on most nights; or
- (c) supplemental weather information at the operating base, as described in point (e)(4) of AMC1 CAT.OP.MPA.192, provided that the provisions of (e)(9) of AMC1 CAT.OP.MPA.192 are met.

AMC1 SPA.HEMS.151 Aircraft tracking system

GENERAL

- (a) The operator should track and monitor HEMS flights from take-off to landing.
- (b) The operator should establish a detailed procedure describing how the aircraft tracking system is to be monitored, what actions are to be taken if a deviation or anomaly has been detected, and when those actions are to be taken.

OPERATIONAL PROCEDURE

- (c) The procedure should take into account the following aspects:
 - (1) the outcome of the risk assessment made when the frequency of position reports was defined;
 - (2) the local environment of the intended operations; and
 - (3) the interface with the operator's emergency response plan.
- (d) Aircraft tracking data should be recorded on the ground and retained for at least 48 h. Following an accident or a serious incident subject to investigation, the data should be retained for at least 30 days, and the operator should be capable of providing a copy of this data without delay.

AMC1 SPA.PINS-VFR.100 Helicopter point-in-space (PinS) approaches and departures with reduced VFR minima

GENERAL

[...]

- (d) If (a)(3) applies, Table 1 applies by day, Table 3 applies by night, and visual references to the ground should be maintained. The MDH in the table should be understood as the DH/MDH of the IAP, whichever is higher.

[...]

- (e)(e) The operator should define SOPs that describe the VFR segment of the departure and approach, including the transition from IFR to VFR and the transition from VFR to IFR.

(f)(e) [...]

- (g)(f) The operator should ensure that the elements in (f)(e) are updated on a regular basis.

(h)(e) [...]

(i)(h) [...]

(j)(i) [...]

- (k)(i) The training and checking elements of an approved training programme may be credited towards compliance with point (j)(i) and need not be duplicated.

(l)~~(k)~~ The training under **(j)**~~(i)~~ should take place on a suitable FSTD, corresponding to the helicopter type on which the operations take place.