Notice of Proposed Amendment 2019-09

All-weather operations

Helicopters and specialised operations

RMT.0379

EXECUTIVE SUMMARY

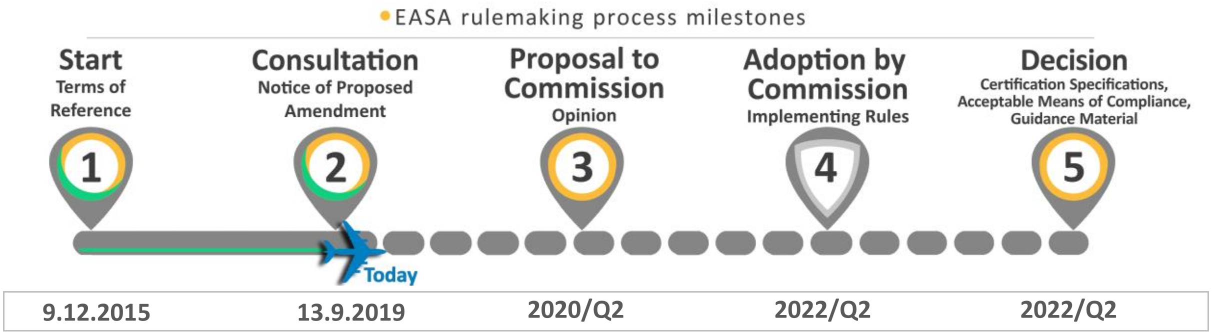
The objective of this Notice of Proposed Amendment (NPA) is to increase the safety of helicopter operations by proposing requirements aimed at reducing the number of accidents under visual flight rules (VFR) in marginal weather conditions. It addresses CAT, NCC and SPO operators, and introduces specific approvals that are accessible to NCO operators.

This NPA proposes to address any regulatory obstacles to the development of helicopter flights under instrument flight rules (IFR) with helicopters, paving the way for further design and use of helicopter instrument approaches, helicopter instrument departures, and helicopter low-level routes. It also proposes a first step towards implementing the 'Weather Information to Pilots Strategic Paper'.

All-weather operations (AWO) usually means any operations that are conducted under IFR with decision heights below 200 ft and visibility below 500 m. Sub-NPA 2018-06(C) 'All-weather operations' of 13 July 2018 already proposed to amend the rules and provisions for such operations, meeting the needs of helicopters that operate to runways, with very little need for variations.

This NPA also focuses on flights that are conducted under IFR with higher decision heights and visibilities, to and from landing sites other than runways, in both controlled and uncontrolled obstacle environment, to reflect the capabilities of helicopters and their expected operating conditions.

Action area:	New technologies and concepts		
Affected rules:	Annex I Definitions, Part-SPA, Part-NCC, and Part-SPO of Commission Regulation (EU) No 965/2012; AMC and GM to Part-CAT, Part-SPA, Part-NCC, and Part-SPO		
Affected stakeholders:	Manufacturers; maintenance organisations (MOs); air operators; approved training organisations (ATOs); aerodrome operators; providers of ATM/ANS; national aviation authorities (NAAs)		
Driver:	Safety	**Rulemaking group:**	No
Impact assessment:	No	**Rulemaking Procedure:**	Standard



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1. About this NPA

1.1. How this NPA was developed

The European Union Aviation Safety Agency (EASA) developed this NPA in line with Regulation (EU) 2018/1139[1] ('Basic Regulation') and the Rulemaking Procedure[2]. This rulemaking activity is included in the latest European Plan for Aviation Safety (EPAS)[3] under rulemaking task RMT.0379.

The text of this NPA has been developed by EASA based on the input of a focused consultation with representatives of helicopter operators, manufacturers and NAAs.

1.2. How to comment on this NPA

Please submit your comments and answer the question in chapter 3.1 using the automated **Comment-Response Tool (CRT)** available at **http://hub.easa.europa.eu/crt/**[4].

The deadline for submission of comments is **15 November 2019.**

1.3. The next steps

EASA will cluster the comments received in discussion topics and will address them in a workshop with the Advisory Bodies (ABs).

Based on the comments received and the conclusions of the workshop, EASA will consider the need to issue amendments to Commission Regulation (EU) No 965/2012[5] and, if necessary, issue an opinion. A summary of the comments received will be provided in the opinion.

The opinion would be submitted to the European Commission, which will use it as a technical basis in order to take a decision on whether or not to amend Commission Regulation (EU) No 965/2012.

A summary of the comments received, a summary of the responses to them as well as of the conclusions of the workshop will be reflected in a comment-response document (CRD). The CRD will be appended to the opinion.

If the European Commission decides that the Regulation should be amended, EASA will issue a decision in order to amend the acceptable means of compliance (AMC) and/or guidance material (GM) to comply with the amendments introduced into that Regulation.

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1 Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535612134845&uri=CELEX:32018R1139).

2 EASA is bound to follow a structured rulemaking process as required by Article 115(1) of Regulation (EU) 2018/1139. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by EASA for the issuing of opinions, certification specifications and guidance material (http://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-18-2015-rulemaking-procedure).

3 https://www.easa.europa.eu/document-library/general-publications/european-plan-aviation-safety-2019-2023

4 In case of technical problems, please contact the CRT webmaster (crt@easa.europa.eu).

5 Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 296, 25.10.2012, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R0965&qid=1564647406994&from=EN).

2. In summary — why and what

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

Helicopter flights under VFR in marginal visual meteorological conditions (VMC) are a major contributor to helicopter accidents.

Marginal VMC are defined as weather conditions not far above the VFR operating minima, and other conditions where the pilot may inadvertently enter instrument meteorological conditions (IMC).

The problem is more acute with helicopters than with aeroplanes because of the following factors:

The VFR operating minima are lower for helicopters and can be as low as 800 m. With low visibilities under VFR, pilots will naturally reduce the speed to adjust to the environment. Under the 'see and avoid' principle, reduced speeds also ensure that pilots will be able to detect obstacles and initiate evasive manoeuvres within ± 30 seconds. With 800-m visibility, the speed should be reduced to 50 kt.

A speed of 50 kt is less than the minimum control speed in IFR (V_{mini}) of most of the current IFR-certified helicopters. V_{mini} reflects the flight characteristics and controllability of the helicopter with sole reference to instruments, by an instrument-rated pilot.

The controllability of the helicopter is further reduced if the pilot is not instrument rated, or if the helicopter is not certified for instrument flight and has no stabilisation system.

A helicopter becomes more and more difficult to control as the visibility and the speed are reduced, whereas a helicopter pilot may be confident in the helicopter's unique capability to fly low and slow.

The limited visibility and relatively low speeds may very well have contributed to many accidents where loss of control and inadvertent IMC was determined to be a root cause.

There are real safety benefits in providing helicopter operators with an option to fly some missions under IFR. IFR also has operational benefits as it increases the reliability of the service.

Helicopters seldom fly from runway A to runway B because they are outcompeted by aeroplanes on such flights. In order to fly IFR, helicopters usually need an instrument approach in the vicinity of their destination. This approach is likely to be a helicopter point-in-space (PinS) approach[6]. They will then need an instrument departure, which is likely to be a helicopter PinS departure[7]. Most helicopters also need low-level routes (LLRs) because they are unpressurised, and most of the times they are not certified for icing conditions.

Not many countries in Europe have the helicopter departure, LLR and approach infrastructure to fly IFR with helicopters. The most advanced countries in this regard are Switzerland and Norway, which have benefited from research projects such as SESAR ProuD.

Even in these countries, the implementation of IFR with helicopters has been difficult due to a number of regulatory obstacles.

[6] A PinS approach is a GNSS-based approach designed specifically for helicopters. PinS approaches fall in two categories:
PinS approaches with instructions to 'proceed visually': they include a visual segment to the landing location, as a conventional approach to an aerodrome would do.
PinS approaches with instructions to 'proceed VFR': are cloud-breaking procedures, after which the pilot needs to decide to either perform a go-around or continue under VFR. Such an approach may serve several destinations, or indeed any destination accessible under VFR.

[7] A PinS departure is a GNSS-based departure designed specifically for helicopters. PinS departures fall in two categories:
PinS departures with instructions to 'proceed visually': the visual segment is flown under IFR from the take-off location.
PinS approaches with instructions to 'proceed VFR': helicopters that use such departures should fly VFR to the initial departure fix from any take-off location.

In many operational scenarios, IFR with helicopters is at a disadvantage compared to VFR because of the following:

— The fuel requirements are higher and sometimes are simply too high due to the additional requirement for alternate fuel, the limited fuel range of helicopters, the requirement for either the destination or the alternate to be equipped with a conventional approach, and the dismantling of the instrument landing systems (ILSs) at non-major aerodromes, all of which often render IFR impossible to helicopters.

— The flight time can be higher, i.e. instrument departures and instrument approaches increase the flight time, especially if not located next to the helicopter destination. The additional flight time may not be negligible compared to the typically short duration of a helicopter flight.

— IFR operating minima may be equal to, or higher than, VFR operating minima: a growing number of helicopter PinS approaches and departures require to fly very short segments of the flight under VFR, requiring visibility minima sometimes much higher than the distance to be flown under VFR.

This proposal is part of Phase 2 of RMT.0379 and addresses regulatory obstacles for the implementation of IFR with helicopters.

ICAO and third-country references relevant to the content of this RMT

ICAO is currently developing a document on all-weather operations with helicopters. This document will provide only guidance and will not create new standards. As with this NPA, the ICAO document is also expected to focus on helicopter PinS approaches and departures, and helicopter LLR networks. ICAO alignment is expected to remain.

Other useful references relevant to the content of this RMT

EUROCONTROL has developed a safety case for the use of helicopter PinS approaches, departures, and helicopter LLRs. The safety case is accessible to anyone with a 'onesky' account or willing to create one.

The FAA allows helicopters to use lower operating minima on approaches to aerodromes designed for aeroplanes, under a specific approval. One element of this NPA proposes to converge towards the FAA Copter CAT II operating minima.

2.2. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 1 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Section 2.1.

Overall objectives:

— the European regulatory framework in the area of AWO should be safe and efficient, relying on a performance- and risk-based approach; and

— manufacturers, air operators and aerodrome operators should be enabled to take full advantage of the safety and economic benefits accrued from new technologies and operational experience.

Actions across all different domains should:

— take into account stakeholders' expectations and operational needs;

— be based on common operational concepts and cross-domain systemic risk assessments;

— result in consistent rules across all domains;

— consider established industry standards;

— be aligned with ICAO SARPs and ICAO documents;

— be harmonised with rule developments by the FAA and other major regulators, as far as possible; and

— be followed up by rule implementation support actions, where needed.

The specific objectives are to:

— provide helicopter operators with options to fly more missions under IFR, or in other words, to identify and address any regulatory issues that put IFR with helicopters at a disadvantage compared to VFR, considering that IFR remains the safer option;

— make best use of helicopter PinS approaches and departures, and helicopter LLRs;

— modernise helicopter offshore approaches and extend their use to non-CAT operators;

— ensure that the helicopter regulatory material is performance based and compatible with the proposals of NPA 2018-06(C).

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

The scope of RMT.0379 is the following:

> *Review and update the AWO rules in all aviation domains, as regards:*
>
> — *the possibility of applying safety performance principles in redrafting the current rules with the aim of allowing a better integration of new and future technologies supporting AWOs, as for example enhanced flight vision systems (EFVSs), synthetic vision systems (SVSs), synthetic vision guidance systems (SVGSs), combined vision systems (CVSs), head-up displays (HUDs);*
>
> — *conventional low-visibility operations (LVOs), such as instrument landing system (ILS)-based CAT II and CAT III approach operations or low-visibility take-offs (LVTOs);*
>
> — *other than LVOs, such as operations using ILS, ground-based augmented global navigation satellite system (GNSS/GBAS) landing system (GLS), global navigation satellite systems (GNSS), non-directional beacons (NDBs) or very high frequency (VHF) omnidirectional ranges (VORs);*
>
> — *miscellaneous items, such as the improvement of existing rule texts and the transposition of the new ICAO approach classification;*
>
> — *harmonisation with bilateral partners (e.g. the FAA) to the extent possible;*
>
> — *introduction of operations with operational credits such as newly introduced SA CAT I81 not being yet part of the ICAO regulatory system.*
>
> *Recommendations and consequent follow-up actions to the Weather Information to Pilots Strategy Paper, itself an outcome of RMT.0379, are now being taken forward as a stand-alone project.*
>
> *Phase 2 (Subtask 2) will address AWOs for helicopters.*

2.3.1. Specific objective 1: Enable onshore IFR operations with helicopters and make best use of helicopter point-in-space (PinS) approaches, departures, and low-level routes (LLRs)

As IFR is often not a practical solution due to the disadvantages discussed in Section 2.1 above, the instrument skills of instrument-rated pilots may erode even when they have access to helicopters certified for IFR, to the extent that some pilots may no longer feel confident in flying IFR in marginal VMC.

The resulting situation is that helicopter pilots rarely fly IFR except in the offshore environment. They fly a lot more under VFR in marginal VMC, sometimes in unintended IMC or even intended IMC, with lower safety margins.

The aim of this NPA is to enable onshore IFR operations with helicopters by addressing the issues discussed in Section 2.1 above in order to reduce the number of related accidents. The safety impact is expected to be positive.

This NPA proposes the following:

— Options to increase the number of available and accessible alternates within the available fuel range:

  — specific approval to reduce minima on a CAT I ILS and on CAT II landing systems;

  — use of destination alternates that are served with GNSS-based approaches only.

— Options to reduce the IFR operating minima below the standard VFR minima:

  — specific approval to reduce VFR minima on a mixed IFR/VFR flight.

— Additional options:

  — approval to fly airborne radar approaches to the coastline;

  — use of night-vision imaging systems (NVISs) on the visual segment of an IFR flight;

  — deletion of the approach ban[8], for SPO.

Notes:

The following measures are already proposed in NPA 2018-06(C) 'All-weather operations', and are applicable to helicopters.

— *Deletion of the approach ban for CAT and NCC, when the RVR/CMV parameter is not available.*

The following measures are also proposed in RMT.0573 'Fuel planning and management' and are expected to be published in an annex to the related 'Fuel planning and management' opinion during the first quarter of 2020, and are applicable to helicopters:

— *The option for CAT operators to use standardised weather information that is not Part-MET certified at destination, in order to select one destination alternate instead of two (only under CAT is there a requirement to select 2 alternates in such cases).*

— *The option to not select an alternate when the destination provides helicopters with two safe landing options, for CAT (this option already exists under NCC and SPO in the current rules).*

— *The option to use alternates with no instrument approach procedures under IFR, if the weather conditions permit at the alternate and on the way to it, for CAT (this option already exists under NCC and SPO in the current rules).*

[8] SPO.OP.215 Commencement and continuation of approach — aeroplanes and helicopters

The following measure is already proposed in NPA 2018-04 'Helicopter emergency medical services performance and public interest sites' (RMT.0325 & RMT.0326 (OPS.057(a) & OPS.057(b)))[9]*:*

— *Reduced HEMS VFR minima on a mixed IFR/VFR flight.*

By making IFR a more attractive solution, the proposal should incentivise the design of helicopter PinS approaches, helicopter instrument departures, and helicopter LLRs, which in turn should ensure that the IFR flight time converges towards the expected VFR flight time in good weather conditions.

2.3.1.1 Existing proposals that already contribute to the same objectives (for information only)

This paragraph displays measures that are already proposed in NPA 2018-06(C) 'All-weather operations — air operations and aircrew' (RMT.0379)[10], NPA 2018-04 'Helicopter emergency medical services performance and public interest sites' (RMT.0325 & RMT.0326 (OPS.057(a) & OPS.057(b))), in the draft upcoming opinion on 'Fuel planning and management' (RMT.0573), and in the CRD to NPA 2016-06(A), (B) and (C).

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

deleted text is ~~struck through~~;

new or amended text is highlighted in grey;

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

Note: The information in this paragraph is not open for comments. It is published in this document to provide easy access to the information needed by the reader to better understand the proposed amendments in Chapter 3.

2.3.1.1.1 NPA 2018-06(C) 'All-weather operations'. Deletion of the approach ban for CAT and NCC, when the RVR/CMV parameter is not available (*for information only*)

CAT.OP.MPA.305 Commencement and continuation of approach

~~(a) The commander or the pilot to whom conduct of the flight has been delegated may commence an instrument approach regardless of the reported RVR/VIS.~~

~~(b) If the reported RVR/VIS is less than the applicable minimum the approach shall not be continued:~~

~~(1) below 1 000 ft above the aerodrome; or~~

~~(2) into the final approach segment in the case where the DA/H or MDA/H is more than 1 000 ft above the aerodrome.~~

~~(c) Where the RVR is not available, RVR values may be derived by converting the reported visibility.~~

~~(d) If, after passing 1 000 ft above the aerodrome, the reported RVR/VIS falls below the applicable minimum, the approach may be continued to DA/H or MDA/H.~~

~~(e) The approach may be continued below DA/H or MDA/H and the landing may be completed provided that the visual reference adequate for the type of approach operation and for the intended runway is established at the DA/H or MDA/H and is maintained.~~

~~(f) The touchdown zone RVR shall always be controlling. If reported and relevant, the midpoint and stopend RVR shall also be controlling. The minimum RVR value for the midpoint shall be 125 m~~

9 https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2018-04

10 https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2018-06

~~or the RVR required for the touchdown zone if less, and 75 m for the stopped. For aircraft equipped with a rollout guidance or control system, the minimum RVR value for the midpoint shall be 75 m.~~

(a) If the reported visibility or controlling RVR for the runway to be used for landing is less than the applicable minimum, then an instrument approach operation shall not be continued:
  (1) past a point at which the aircraft is 1 000 ft above the aerodrome elevation; or
  (2) if the DH or MDH is higher than 1 000 ft, in the final approach segment (FAS).

(b) If the required visual reference is not established, then a missed approach shall be executed at or before the DA/H or the MDA/H.

(c) If the required visual reference is not maintained after the DA/H or the MDA/H, then a go-around shall be executed promptly.

GM1 CAT.OP.MPA.305 Commencement and continuation of approach

APPLICATION OF RVR OR VIS REPORTS

(a) There is no prohibition on the commencement of an approach based on the reported RVR or VIS. The restriction in CAT.OP.MPA.305 applies only if the RVR or VIS is reported and applies to the continuation of the approach past a point where the aircraft is 1 000 ft above the aerodrome elevation or into the FAS as applicable.

(b) If a deterioration in RVR or VIS is reported once the aircraft is below 1 000 ft or into the FAS, as applicable, then there is no requirement for the approach to be discontinued. In this situation, if visual reference is required, it would apply at the DA/H.

(c) Where additional RVR information is provided (e.g. midpoint and stop end), this is advisory; such information may be useful to the pilot in order to determine whether there will be sufficient visual reference to control the aircraft during roll-out and taxi. For operations where the aircraft will be controlled manually during roll-out, Table 1.A in AMC1 SPA.LVO.100(a) provides an indication of the RVR that may be required to allow manual lateral control of the aircraft on the runway.

NCC.OP.230 Commencement and continuation of approach

~~(a) The pilot-in-command may commence an instrument approach regardless of the reported runway visual range/visibility (RVR/VIS).~~

~~(b) If the reported RVR/VIS is less than the applicable minimum the approach shall not be continued:~~
  ~~(1) below 1 000 ft above the aerodrome; or~~
  ~~(2) into the final approach segment in the case where the decision altitude/height (DA/H) or minimum descent altitude/height (MDA/H) is more than 1 000 ft above the aerodrome.~~

~~(c) Where the RVR is not available, RVR values may be derived by converting the reported visibility.~~

~~(d) If, after passing 1 000 ft above the aerodrome, the reported RVR/VIS falls below the applicable minimum, the approach may be continued to DA/H or MDA/H.~~

~~(e) The approach may be continued below DA/H or MDA/H and the landing may be completed provided that the visual reference adequate for the type of approach operation and for the intended runway is established at the DA/H or MDA/H and is maintained.~~

~~(f) The touchdown zone RVR shall always be controlling.~~

(a) If the reported visibility or controlling RVR for the runway to be used for landing is less than the applicable minimum, then an instrument approach operation shall not be continued:
  (1) past a point at which the aircraft is 1 000 ft above the aerodrome elevation; or
  (2) if the DH or MDH is higher than 1 000 ft into the FAS.

(b) If the required visual reference is not established, a missed approach shall be executed at or before the DA/H or the MDA/H.

(c) If the required visual reference is not maintained after the DA/H or the MDA/H, a go-around shall be executed promptly.

GM1 NCC.OP.230 Commencement and continuation of approach

APPLICATION OF RVR OR VIS REPORTS

(a) There is no prohibition on the commencement of an approach based on the reported RVR or VIS. The restriction in CAT.OP.MPA.305 applies only if the RVR or VIS is reported and applies to the continuation of the approach past a point where the aircraft is 1 000 ft above the aerodrome elevation or in the FAS as applicable.

(b) If a deterioration in the RVR or VIS is reported once the aircraft is below 1 000 ft or in the FAS, as applicable, then there is no requirement for the approach to be discontinued. In this situation, the normal visual reference requirements would apply at the DA/H.

(c) Where additional RVR information is provided (e.g. midpoint and stop end), this is advisory; such information may be useful to the pilot in order to determine whether there will be sufficient visual reference to control the aircraft during roll-out and taxi. For operations where the aircraft will be controlled manually during roll-out, Table 1.A in AMC1 SPA.LVO.100(a) provides an indication of the RVR that may be required to allow manual lateral control of the aircraft on the runway.

Additional information regarding the deletion of the approach ban for CAT and NCC

The previously published amended criteria regarding the commencement and continuation of the approach allows helicopters to fly an approach to the decision height to a location where:

— no Part-MET-approved weather exists;

— no one on ground can transmit the latest weather information to the pilot.

All that is needed to fly the approach is the QNH. The instrument approach chart will in any case define how the QNH should be obtained.

Such changes are needed to enable helicopter PinS approaches to locations other than aerodromes. The proposal should be extended to SPO.

2.3.1.1.2 NPA 2018-04 'Helicopter emergency medical services performance and public interest sites' — Reduced HEMS VFR minima on a mixed IFR/VFR flight (*for information only*)

SPA.HEMS.120 HEMS operating minima

(a) HEMS flights operated under VFR ~~in performance class 1 and 2~~ shall comply with the HEMS specific ~~the~~ weather minima ~~in Table 1~~ for dispatch and en-route phase of the HEMS flight.

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

~~*Table 1*~~			
~~HEMS operating minima~~			
~~2 PILOTS~~		~~1 PILOT~~	
~~DAY~~			
~~Ceiling~~	~~Visibility~~	~~Ceiling~~	~~Visibility~~
~~500 ft and above~~	~~As defined by the applicable airspace VFR minima~~	~~500 ft and above~~	~~As defined by the applicable airspace VFR minima~~
~~499 - 400 ft~~	~~1000 m(*)~~	~~499 – 400 ft~~	~~2 000 m~~
~~2 PILOTS~~		~~1 PILOT~~	
~~399 - 300 ft~~	~~2 000 m~~	~~399 – 300 ft~~	~~3 000 m~~
~~NIGHT~~			
~~Cloud base~~	~~Visibility~~	~~Cloud base~~	~~Visibility~~
~~1 200 ft(**)~~	~~2 500 m~~	~~1 200 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 any obstacles in time to avoid a collision.~~.

~~(**) During the en-route phase, cloud base may be reduced to 1.000 ft for short periods.~~

~~(b) The weather minima for the dispatch and en-route phase of a HEMS flight operated in performance class 3 shall be a cloud ceiling of 600 ft and a visibility of 1.500 m. Visibility may be reduced to 800 m for short periods when in sight of land if the helicopter is manoeuvred at a speed that will give adequate opportunity to observe any obstacle and avoid a collision.~~

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

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

HEMS VFR MINIMA: CEILING AND VISIBILITY

<table>
<tr><td colspan="4">Table 1</td></tr>
<tr><td colspan="4">HEMS operating minima</td></tr>
<tr><td colspan="4">DAY</td></tr>
<tr><td colspan="2">Ceiling</td><td colspan="2">Visibility</td></tr>
<tr><td colspan="2">500 ft and above</td><td colspan="2">As defined by the applicable airspace VFR minima (*)</td></tr>
<tr><td colspan="2">499–300 ft</td><td colspan="2">1 500 m (*)</td></tr>
<tr><td colspan="4">NIGHT</td></tr>
<tr><td colspan="2">NVIS</td><td colspan="2">No NVIS</td></tr>
<tr><td>Ceiling</td><td>Visibility</td><td>Ceiling</td><td>Visibility</td></tr>
<tr><td>1 200 ft (**)</td><td>3 000 m</td><td>1 200 ft (**)</td><td>5 000 m</td></tr>
<tr><td></td><td></td><td>1 500 ft (**)</td><td>3 000 m</td></tr>
</table>

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

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

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

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

<table>
<tr><td colspan="3">Table 2</td></tr>
<tr><td colspan="3">Reduced HEMS operating minima
when instructed to 'proceed VFR' following an instrument approach</td></tr>
<tr><td colspan="3">x is the distance between the missed approach point (MAPt) and the heliport or operating site</td></tr>
<tr><td>X</td><td>Visibility</td><td>Ceiling</td></tr>
<tr><td>x < 1 000 m</td><td>1 000 m</td><td>MDH</td></tr>
<tr><td>1 000 m ≤ x ≤ 3 000 m</td><td>X</td><td>MDH</td></tr>
<tr><td>3 001 m ≤ x ≤ 5 000 m</td><td>3 000 m</td><td>MDH</td></tr>
</table>

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

Additional information regarding the reduced HEMS VFR minima on a mixed IFR/VFR flight

The previously published NPA 2018-04 'Helicopter emergency medical services performance and public interest sites' will be reviewed following the comments received to it.

NPA 2018-04 proposes reduced VFR minima for HEMS operations under IFR using PinS approaches and departures to an IDF, when the instrument chart instructs the pilot to 'proceed VFR'.

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

NPA 2018-04 proposes to reduce and simplify the VFR minima for that case in order to align the minimum visibility with that needed to complete the procedure.

The same issues exist for non-HEMS operators under CAT, NCC and SPO, and the same approach may be used. However, the flight crew experience, training and checking requirements cannot be set as high as they are under the HEMS regulations. The resulting VFR minima will be higher for non-HEMS operators. A specific approval will be needed to reduce the VFR minima for non-HEMS operators, using Article 4.3 of Commission Implementing Regulation (EU) No 923/2012 on standardised European rules of the air (SERA)[11].

Article 4.3 'Exemptions for special operations'

> […]
> *3. This Article is without prejudice to Article 3 and may be applied in the cases where the activities listed under paragraph 1, cannot be carried out as operational air traffic or where they otherwise may not benefit from the flexibility provisions contained in this Regulation.*
> […]

This Article shall also be without prejudice to helicopter operating minima contained in the specific approvals granted by the competent authority, pursuant to Annex V (Part-SPA) to Commission Regulation (EU) No 965/2012.

[11] Commission Implementing Regulation (EU) No 923/2012 of 26 September 2012 laying down the common rules of the air and operational provisions regarding services and procedures in air navigation and amending Implementing Regulation (EU) No 1035/2011 and Regulations (EC) No 1265/2007, (EC) No 1794/2006, (EC) No 730/2006, (EC) No 1033/2006 and (EU) No 255/2010 (OJ L 281, 13.10.2012, p. 1) (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R0923&qid=1564671348661&from=EN).

2.3.1.1.3 Draft upcoming opinion on 'Fuel planning and management' (RMT.0573), CRD to NPA 2016-06(A)(B)(C), and associated AMC and GM (*for information only*)

The opinion and the related CRD are still to be published and the following amendments are subject to change.

CAT.OP.MPA.192 ~~181~~ Selection of aerodromes and operating sites — helicopters

(a) For flights under instrument meteorological conditions (IMC), the commander shall select a take-off alternate aerodrome within ~~one~~ 1 hour flying time at normal cruising speed if it would not be possible to return to the site of departure due to meteorological reasons.

(b) At the planning stage, for each IFR flight, the operator shall select and specify in the operational and ATS flight plans one or more aerodromes or operating sites so that two options for a safe landing in normal operation will be available, except as provided under SPA.HOFO.120(b).

(c) The operator shall apply appropriate safety margins to flight planning in order to take into account a possible deterioration of the meteorological conditions at the estimated time of landing compared to the available forecast.

(d) For each IFR flight the operator shall ensure that sufficient means are available to navigate and land at the destination aerodrome or at any destination alternate aerodrome in the case of loss of capability for the intended approach and landing operation.

AMC1 CAT.OP.MPA.192(a) Selection of aerodromes and operating sites — helicopters

PLANNING MINIMA FOR TAKE-OFF ALTERNATE AERODROMES

The operator should only select an aerodrome or landing site as a take-off alternate aerodrome when the appropriate weather reports and/or forecasts indicate that, during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the take-off alternate aerodrome, the weather conditions will be at or above the applicable landing minima specified in accordance with CAT.OP.MPA.110. The ceiling should be taken into account when the only approach operations available are type A approach operations. Any limitation related to OEI operations should be taken into account.

AMC1 CAT.OP.MPA.192(c);(d) Selection of aerodromes and operating sites — helicopters

PLANNING MINIMA FOR DESTINATION AERODROME(S) AND SELECTION OF ALTERNATE AERODROME(S)

(a) When selecting the destination aerodrome(s), the operator should ensure that one of the following conditions are met:

(1) for a land destination, the duration of the flight and the meteorological conditions prevailing are such that, during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the aerodrome or operating site, an approach and landing is possible under visual meteorological conditions (VMC) from the minimum safe altitude (MSA) at the initial approach fix (IAF) or before;

(2) for a land destination:

(i) the available current meteorological information indicates that the following meteorological conditions at the destination aerodrome will exist from 2 hours before to 2 hours after the estimated time of arrival, or from the actual time of departure to 2 hours after the estimated time of arrival, whichever is the shorter period:

(A) a cloud base of at least 120 m (400 ft) above the minimum associated with the instrument approach procedure; and

(B) visibility of at least 5 000 m;

(ii) two published instrument approaches with independent navigation aids are available at the aerodrome of intended landing; and

(iii) fuel planning is based upon the approach procedure that requires most fuel and 15-minutes fuel (at holding speed) are added to the trip fuel.

(3) one destination alternate aerodrome is selected or the destination aerodrome is isolated, and the appropriate weather reports and/or forecasts indicate that, during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the aerodrome or operating site, the weather conditions will be at or above the applicable planning minima as follows:

(i) RVR/VIS specified in accordance with CAT.OP.MPA.110; and

(ii) for Type B instrument approach operations, the ceiling at or above (M)DH;

(4) one destination alternate aerodrome is selected, and the meteorological information obtained in accordance with the procedures established in the operations manual gives a reasonable probability of landing at destination; or

(5) two destination alternates are selected.

(b) The operator should specify any alternate(s) in the operational flight plan.

(c) If the site of intended landing is isolated and no alternate aerodrome is available, a point of no return (PNR) should be determined.

PLANNING MINIMA FOR DESTINATION ALTERNATE AERODROMES

(d) The operator should only select the destination alternate aerodrome(s) if the appropriate weather reports and/or forecasts indicate that, during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the aerodrome or operating site, the weather conditions will be at or above the applicable planning minima as follows:

(1) if the destination aerodrome has been selected under (a)(2) or (a)(4) above, the planning minima for the destination alternate aerodrome(s) are as shown in Table 1.

Table 1: Planning minima for destination alternate aerodromes

Type of approach	**Planning minima**
Type A or Type B	RVR/VIS + 400 m Ceiling should be at or above (M)DH + 200 ft
VFR or visual approach	VFR from a position on the instrument flight path to the destination alternate

(2) if the destination aerodrome has been selected under (a)(3) above, the planning minima for the destination alternate aerodrome(s) are as shown in Table 2:

Table 2: Planning minima for the destination alternate aerodrome(s) with a reasonable probability of landing at destination

Type of approach	Planning minima
Type A or Type B	RVR/VIS + 800 m (M)DH + 400 ft
VFR or visual approach	VFR from a position on the instrument flight path to the destination alternate

METEOROLOGICAL INFORMATION TO ESTABLISH A REASONABLE PROBABILITY OF LANDING AT DESTINATION

(e) In order to assess the probability of landing at destination, the operator should use supplementary meteorological information when flying under IFR to heliports/operating sites without the Part-MET meteorological information that is usually available at aerodromes, or the operator should select two destination alternates.

(f) The operator should establish a system for observing and assessing weather, and for distributing meteorological information.

(g) The operator should describe the system defined in (f) in the operations manual.

(h) The operator should assess weather for the destination aerodrome, and if different, for the location of the instrument approach. The assessment should be based on the following:

(1) an appropriate weather forecast at an aerodrome where it is reasonable to expect that local conditions should not be significantly different from the conditions at the destination and the location of the approach;

(2) if the aerodrome described in (1) above is farther than 15 NM away from the location of the approach and the destination, the following conditions should be met:

(i) supplementary meteorological information should be available and should confirm that the current weather conditions at destination and at the location of the approach are expected to remain similar to the conditions at the aerodrome used in (1) above;

(ii) low-level area forecasts should confirm that the weather is expected to remain similar at destination and at the aerodrome used for the weather assessment, at the expected time of landing;

(3) any risk of adverse local weather condition forecast in the low-level area forecasts and appropriate to the destination and the location of the approach should be taken into account.

(i) The following should qualify as supplementary meteorological information:

(1) a reliable, time-stamped image from a serviceable digital camera of known location, bearing, and altitude that shows the weather conditions in the approach path at destination;

(2) a meteorological observation from a properly trained observer;

(3) a report from non-certified automatic weather observation systems.

(j) The operator should only establish that there is a reasonable probability of landing at destination if the flight time to the destination and then to the alternate aerodrome is less than 3 hours and if, according to the assessment described in (h), during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the location of the approach, the following conditions are met:

(1) the weather conditions will be at or above the planning minima for the approach; and

(2) if the location of the approach is different from that of the destination aerodrome, the weather conditions will permit the continuation of the flight to the destination.

(k) Weather observations from an aerodrome identified in (1) above, or the supplementary meteorological information described in (i), should be available, be no more than 30 minutes old, and be used to assess approach and landing conditions in accordance with CAT.OP.MPA.300.

(l) The weather observations or reports described in (k) may be transmitted to the flight crew using installed equipment, a transmitting portable electronic device (T-PED), radio contact with trained personnel, or any equivalent means.

(m) The operator should store the weather assessments established in (h) and the weather observations used in (k) for a period of 3 months.

(n) In case a landing at destination could not be conducted because of the weather, whilst the operator assessed that it would, the operator should investigate and take all necessary measures to improve future weather assessments.

1. New GM1 CAT.OP.MPA.192(c);(d) is introduced as follows. It contains the text of the existing GM1 CAT.OP.MPA.181, further amended:

GM1 CAT.OP.MPA.192(c);(d) ~~181~~ Selection of aerodromes and operating sites — helicopters

~~LANDING FORECAST~~ APPROPRIATE METEOROLOGICAL INFORMATION

(a) Meteorological data has ~~have~~ been specified that conforms to ~~the standards contained in the Regional Air Navigation Plan and~~ ICAO Annex 3 and Annex V (Part-MET) to Regulation (EU) 2017/373. As the following meteorological data is ~~are~~ point-specific, caution should be exercised when associating it with nearby aerodromes (or helidecks).

(b) Meteorological reports (METARs)

(1) Routine and special meteorological observations at offshore installations should be made during periods and at a frequency agreed between the competent authority of meteorological services and the operator concerned. They should ~~comply with the provisions contained in the meteorological section of the ICAO Regional Air Navigation Plan, and should~~ conform to points MET.TR.200 and MET.TR.205 of Annex V (Part-MET) to Regulation (EU) 2017/373 ~~the standards and recommended practices~~, including the desirable accuracy of observations, ~~promulgated in ICAO Annex 3~~ specified in GM2 MET.TR.210.

(2) Routine and selected special reports are exchanged between meteorological offices in the METAR (aerodrome routine meteorological report) or SPECI (~~aviation selected~~

aerodrome special meteorological report) code forms prescribed by the World Meteorological Organization ~~Organisation~~.

(c) Aerodrome forecasts (TAFs)

(1) The aerodrome forecast consists of a concise statement ~~of the mean or average meteorological conditions expected~~ of the expected meteorological conditions at an aerodrome and any significant changes expected to occur ~~at an aerodrome or aerodrome~~ during a specified period of validity, which is ~~normally~~ not less than 9 hours, ~~or~~ and not more than ~~24~~ 30 hours in duration. The forecast includes surface wind, visibility, weather and cloud, and expected changes of one or more of these elements during the period. Additional elements may be included as agreed between the meteorological authority and the operators concerned. Where these forecasts relate to offshore installations, barometric pressure and temperature should be included to facilitate the planning of helicopter landing and take-off performance.

(2) Aerodrome forecasts are most commonly exchanged in the TAF code form, and the detailed description of an aerodrome forecast is promulgated in ~~the ICAO Regional Air Navigation Plan and also in ICAO Annex 3~~ point MET.TR.220 of Annex V (Part-MET) to Regulation (EU) 2017/373, together with the operationally desirable accuracy elements specified in GM3 MET.TR.220.~~ In particular, the observed cloud height should remain within ±30 % of the forecast value in 70 % of cases, and the observed visibility should remain within ±30 % of the forecast value in 80 % of cases.~~

(d) Landing forecasts (TRENDS)

(1) The landing forecast consists of a concise statement ~~of the mean or average meteorological conditions expected~~ that indicates any significant changes expected to occur at an aerodrome ~~or aerodrome~~ during the ~~two~~2-hour period immediately following the time of the observation to which it is appended~~issue~~ in respect of one or more of the following meteorological elements:~~. It contains~~ surface wind, visibility, ~~significant~~ weather phenomena, ~~and~~ cloud ~~elements~~ and other significant information, such as barometric pressure and temperature, as may be agreed between the meteorological authority and the operators concerned.

(2) The detailed description of the landing forecast is promulgated in ~~the ICAO Regional Air Navigation Plan and also in ICAO Annex 3~~ point MET.TR.225 of Annex V (Part-MET) to Regulation (EU) 2017/373, together with the operationally desirable accuracy of the forecast elements. In particular, the value of the observed cloud height and visibility elements should remain within ± 30 % of the forecast values in 90 % of the cases.

(3) Landing forecasts most commonly take the form of a TREND forecast appended to a local routine report, ~~or~~ local special report, METAR or SPECI. ~~selected meteorological reports in the METAR code, to which either the code words 'NOSIG', i.e. no significant change expected; 'BECMG' (becoming), or 'TEMPO' (temporarily), followed by the expected change, are added. The 2-hour period of validity commences at the time of the meteorological report.~~

[…]

GM2 CAT.OP.MPA.192(c);(d) Selection of aerodromes and operating sites — helicopters

SUPPLEMENTARY METEOROLOGICAL INFORMATION USING DIGITAL IMAGERY

(a) One or more digital images from a digital camera may be considered as a supplementary meteorological information if the following criteria are met:

(1) The camera should be of known altitude, azimuth, elevation and field of view. If pan, tilt or zoom functions are available, the image should include the elevation, azimuth and an indication of how much the image is zoomed;

(2) The camera should be robustly fixed to a solid surface and protected from deliberate or accidental interference. It should be secured from the effects of wind and precipitation;

(3) The digital image should contain date and times-stamp information or other means to ensure that the image is up to date;

(4) The digital image should have a clearly specified update frequency.

(b) If the operator uses the digital image to assess ceiling and visibility, the operator should document the height, bearing and distance of clearly distinguishable features and should provide a reference image taken on a clear day with negligible cloud or mist.

(c) The operator may achieve the purpose of paragraph (b) above with a selectable reference image or a selectable data layer to be superposed on the image. Any selectable reference image should clearly indicate it is a reference image, and not a current image.

(d) If the operator uses night-time digital images, the quality of those images should remain sufficient to be compared to the reference image, and the darkness should not obscure the distinguishable features described in paragraph (b) above. This may be achieved by adapting the camera to the current luminosity.

(e) If the digital image is stamped with the value of one or more weather parameters, there should be a means to ensure that each parameter is up to date and provided by a reliable and functional sensor, or the parameter should not be displayed.

(f) If the camera is exposed to local meteorological conditions such as foehn effect, the operator should document these local conditions or restrict the use of the picture to the immediate vicinity of the camera.

Additional information regarding the amendments to be published in the Opinion on 'Fuel planning and management' and in the related CRD to NPA 2016-06(A)(B)(C):

The amendments have been drafted following a comment to the fuel opinion in order to address the following issues:

Reduced number of alternates when no Part-MET-certified weather forecasts are available at destination.

Reduced number of alternates when flying to a destination aerodrome that provides two or more independent landing options.

Use of non-Part-MET-certified weather information, in line with the Weather Information to Pilots Strategy Paper as applied to helicopter IFR operators.

More detailed explanations on the changes to the FUEL OPINION and CRD can be found below:

— CAT.OP.MPA.192 Selection of aerodromes and operating sites — helicopters (new number)

— This is based on the existing CAT.OP.MPA.181 'Selection of aerodromes and operating sites – helicopters', renumbered and amended, together with the content of existing CAT.OP.MPA.182 'Destination aerodromes — instrument approach operations'.

It was realised that the regulations defining the need for alternates could be summarised for helicopters the way it was done for aeroplanes, by requiring:

— two landing options;

— contingencies in case of the loss of navigation aids;

— contingencies in case the actual weather was worse than forecast.

— The remainder of the CAT.OP.MPA.181 and 186 rules, defining the number of alternates, and the weather minima at destination and at destination alternates, was then moved to AMC level.

— AMC1 CAT.OP.MPA.192(a) Selection of aerodromes and operating sites — helicopters | Planning minima for take-off alternate aerodromes (new)

— While the requirement for take-off alternates remains in the rules, the weather minima at the take-off alternate is being moved to AMC level where all weather minima are defined.

— This is the transposition of paragraph (a) of existing CAT.OP.MPA.186 'Planning minima for IFR flights — helicopters':

AMC1 CAT.OP.MPA.192(c);(d) Selection of aerodromes and operating sites — helicopters

— *Planning minima for destination aerodrome(s) and selection of alternate aerodrome(s)*

— *Planning minima for destination alternate aerodromes*

— *Meteorological information to establish a reasonable probability of landing at destination*

— This new AMC incorporates elements of the current CAT.OP.MPA.181 and 186 rules, defining the number of alternates and the weather minima at destination and at destination alternates.

— It contains paragraphs (b) to (e) of existing CAT.OP.MPA.181, and paragraph (b) of existing CAT.OP.MPA.186.

— The AMC is further amended, following a key comment from the NPA 2016-06 consultation. The commentator highlighted that helicopters may benefit either from non-Part-MET-certified weather information at the landing site, or from off-site Part-MET-certified information that remains relevant to the landing site, which should be taken into account. Indeed, helicopters fly to places with no aerodrome infrastructure. They can do so in IFR when a PinS approach exists. The range of a helicopter is usually much shorter than that of an aeroplane, which makes it more difficult to find alternates within the fuel range. When two alternates are needed, the fuel requirements may become so restrictive that IFR operations would not be possible.

— The AMC allows helicopters to fly IFR to such destinations with only one alternate, with mitigations to ensure that the level of safety will remain the same.

- One of the mitigations ensures that the available weather information remains reliable, when not Part-MET certified. The use of non-Part-MET-certified, but reliable, weather information is consistent with the EASA Weather Information to Pilots Strategy Paper as applied to helicopter IFR operators.
- Increased weather minima at the alternate then mitigate the greater risk of the alternate being needed due to unforeseen weather conditions at destination.
- It was considered of strategic importance that the pilot could obtain the updated weather information at destination in flight, in order to decide whether to continue to destination or anticipate a diversion. When only non-Part-MET-certified weather information is available at destination, the use of an in-flight weather application on an electronic flight bag (EFB) was therefore considered to be an acceptable means of receiving the update as well as any other means, taking into account Opinion No 10/2017 'Transposition of provisions on electronic flight bags from ICAO Annex 6'[12] and related AMC and GM.
- The planning minima at destination alternates were also amended to transition from precision/non-precision approaches to Type A/Type B approaches. The amendment resulted in some simplification:

  GM1 CAT.OP.MPA.192(c);(d) Appropriate meteorological information (new number)
  The existing GM1 CAT.OP.MPA.181 'Selection of aerodromes and operating sites — helicopters | Landing forecast' is renumbered and with a different title.

  GM2 CAT.OP.MPA.192(c);(d) Supplementary meteorological information using digital imagery

GM2 is written in support of the above AMC2 CAT.OP.MPA.192 to illustrate how operators can ensure that non-Part-MET-certified information such as digital imagery is reliable.

The amendments to the Opinion on 'Fuel planning and management' (RMT.0573) and the related CRD to NPA 2016-06 have been consulted with the EASA Advisory Bodies.

EASA then reviewed the amendments, and introduced the following option:

Use of a VFR alternate under IFR

The option to select an alternate aerodrome without an instrument approach procedure may be particularly useful in winter under a high-pressure weather pattern. Low-visibility and low-stratus clouds may prevail at destination and in valleys, yet the IFR cruise and descent take place in clear skies, and a number of landing options remain available under VFR on the hills, mountains, or on high ground. VMC from a position on the instrument flight path to the alternate should be defined in accordance with the 'standardised European rules of the air'. For example, when planning to use an alternate in Class G airspace by day, the ceiling should be above 2 000 ft or MSA/TAA, whichever is higher, and the visibility should be at least 1 500 m.

Equivalent amendments are not needed for NCC and SPO, because the NCC and SPO rules are already very light. However, the NCC and SPO rules may require minor amendments for harmonisation purposes.

This NPA will also make use of the amendments to be published in the Opinion on 'Fuel planning and management' (RMT.0573) and in the related CRD to NPA 2016-06, and will build upon them when

[12] https://www.easa.europa.eu/document-library/opinions/opinion-102017

introducing new proposals for commercial air transport. They are necessary to the reader for the understanding of this document.

2.3.2. Specific objective 2: Modernise helicopter offshore approaches

This NPA proposes to modernise offshore airborne radar approaches with the following measures:

— extending the airborne radar approaches to NCC and SPO, for harmonisation purposes.

— introducing the option to use OEM designed offshore approaches instead of the classic airborne radar approach under the existing SPA.HOFO approval.

NCC and SPO offshore operators currently have no SPA.HOFO rules for offshore approaches. They may perform such approaches if approved to do so under a SPA.HOFO approval. If approved to do so, it is expected that they will meet the criteria defined for CAT operators that operate under ORO.FC and SPA.HOFO. This NPA proposes to fill the regulatory gap for clarification purposes. The impact is negligible.

The use of OEM designed offshore approaches allows to officially use GNSS as the primary navigation means, while the airborne radar remains to be used for confirmation of the navigation and for obstacle clearance. It also enables OEMs to innovate by making best use of the available navigation systems and autoflight modes. A new AMC is needed to implement these offshore approaches.

2.3.3. Specific objective 3: Ensure that the helicopter regulatory material is performance-based and compatible with the proposals of NPA 2018-06(C)

This NPA proposes to amend the IFR operating minima under CAT, NCC and SPO, in order to achieve the following:

— implementation of the new definitions of Type A, Type B, 2D, and 3D approach operations;

— minor changes to reflect the operational capabilities of helicopters;

— introduction of helicopter PinS approaches to reflect the recent evolution of ICAO Doc 8168 (PANS-OPS);

— simplification.

The IFR operating minima are changed only to the margins. The impact is negligible.

2.4. Discussions that did not lead to a proposed amendment

Implementation of unproven technologies and procedures

The regulatory material developed for aeroplanes with CAT II operating minima, and with operational credit to CAT I operating minima, should only be valid for helicopters in a runway environment for the following reasons:

Technologies that are eligible to operational credit, such as enhanced vision systems (EVSs), synthetic vision systems (SVSs), combined vision systems (CVSs) but also head-up displays (HUDs) and head-mounted displays (HMDs) have been tested in a runway environment. The underlying technology is not yet proven to be able to address the numerous issues related to a flight to a FATO in an uncontrolled obstacle environment.

Certification specifications for helicopter flight tests assume the helicopter is flown visually during the final approach:

All profiles required to be test-flown to derive the performance data are flown under VMC. CAT A procedures, which are required under CAT for IFR, are typically achieved through test flights where a visual approach is established from 500 ft above aerodrome elevation (AAE).

Typical profiles included in the CAT A supplement of the aircraft flight manuals are:

— clear airfield procedure,

— short field procedure,

— vertical take-off and landing (VTOL) procedure,

— surface level heliport procedure,

— elevated heliport procedure,

— confined area procedure.

Except for the ‘clear airfield procedure’, a typical TDP/LDP is 100–120 ft with a speed of around 30 kt and a rate of descent at or below 400 ft/min. Such procedure need to be considered in the LVO discussion.

Some helicopter types have specific ‘confined area procedures’ defined in their flight manuals, which are generally the most restrictive. TDP/LDP is typically higher than 200 ft AAE, and such procedures would therefore never qualify for an approval under Part-SPA.LVO, and will therefore not be considered in the LVO discussion.

The majority of helicopters have a V_{mini} that is around 60–70 kt. However, recently some types have been certified with a V_{mini} of 30–40 kt provided the 4-axis autopilot is used in coupled mode.

IFR certification does not cover Category A procedures:

Furthermore, from test flight practices, as can be read above, CAT A certification is done under VMC. Several helicopters that have been certified recently would allow clear airfield procedures with ‘running’ landing and ‘running’ take-off procedures to be flight tested in IMC. Such procedures avoid high pitch changes associated with the acceleration/deceleration typical of the ‘conventional’ take-off and landing manoeuvres (i.e. a high nose-down attitude to accelerate and a high nose-up to decelerate). As a positive side effect, these ‘running’ procedures offer more passenger comfort. Such ‘running’ procedures have the added benefit that the approach to landing can be done completely at the V_{mini} speeds, and would allow an auto-land possibility on runways, similar to aeroplane operations, as the runway length can be used to decelerate.

Operations other than to a runway (i.e. hospital rooftops or (offshore) helidecks) would not allow such a ‘running’ procedure, as the dimensions of the FATO are too small.

This NPA proposes to leave the amendments proposed by NPA 2018-06 ‘All-weather operations’ unchanged. Helicopter operators can request CAT II and CAT I with operational credit approvals under the same conditions as aeroplane operators. These conditions necessarily include the use of a runway.

In case helicopter or avionics manufacturers demonstrate that new technologies can justify operational credit in a non-runway environment in the near future:

— operators may propose alternative means of compliance to implement them under a specific approval;

— EASA may issue new AMC.

It is foreseen that the flexibility provisions in Article 71 of the Basic Regulation will not be needed because the implementing rules will not be required to be amended.

Deletion of the requirement for a specific approval when flying RNP 0.3 with helicopters

The deletion of the approvals was considered for the following reasons:

— There is no specific AMC for helicopter approvals; RNP 0.3 are standard PBN operations. The ICAO PBN manual doesn't describe specific requirements for RNP 0.3. So there is nothing much to approve.

— The safety-critical final approach segment already doesn't require an approval under SPA.PBN.100 if flown under RNP 0.3. The other elements of the approach do require an approval although they are less critical in terms of safety, as illustrated in GM1 SPA.PBN.100.

— It was discussed whether the approval process might be considered as burdensome and that it may slow down the adoption of helicopter IFR.

However, the policy for specific PBN approvals remains unchanged: the industry should gain sufficient experience with a given kind of operations under an approval, with additional oversight of the NAAs, before the requirement for the approval is removed. The consulted NAAs are very keen on this approach.

Moreover, the approval process addresses only the way operators and authorities work with each other, and does not impact on the AWO regulations or the ability for a helicopter operator to fly RNP 0.3 routes, approaches and departures under IFR.

Therefore, this NPA does not propose the deletion of the specific approval for RNP 0.3 with helicopters.

In the future, when helicopter RNP 0.3 operational experience is sufficient, the specific approval for RNP 0.3 with helicopters could then be deleted through a 'regular update' of the AIR OPS Regulation.

Development of AMC material for RNP 0.3 with helicopters under SPA.PBN

RNP 0.3 helicopter LLR networks have a number of specificities that are worth discussing.

— There may be obstacles, or control zones on each side of the route.

— The route may be within radar coverage or not.

— The route may be bidirectional, may allow a single altitude or flight level, or both.

— In case the route was not in controlled airspace, nor in a radio mandatory zone, nor in a transponder mandatory zone, or in none of the above, the density of local traffic should be considered.

— Unforeseen weather conditions may be encountered during the flight:

  — helicopters are seldom certified for icing conditions;

  — not all helicopters operated on-shore are equipped with a weather radar.

— Fewer options may be available to change track or altitude on a helicopter LLR, compared to a conventional route.

However, the specificities and associated risks are local and specific to a given route and not all are directly related to the navigation performance. They can only be covered by a risk assessment by the operator or by the designated ATS provider.

Helicopter PinS approaches also have specific risks, but these are also not related to the navigation performance.

IFR with helicopters is considered much safer than VFR, especially in marginal weather conditions. There is however one element of risk that may appear to be greater under IFR, more specifically on some PinS approaches.

> A risk of mid-air collision exists when cloud-breaking into VMC, especially when departing out of IMC towards (marginal) VMC at a destination located in Class F-G airspace. This risk should be taken into account as part of the risk assessment of the operator and that of the local ATS provider. Electronic conspicuity devices or a change in the class of airspace may be necessary depending on the density of traffic, especially at places where aircraft tend to converge such as aerodromes or conventional navigation aids. Heliports and operating sites may be affected to a lesser extent, and there is likely to be less VFR traffic when the weather conditions justify flying IFR. Also, if pilots fly VFR in marginal VMC, there is a risk that they will be flying head-down a little too much for the whole duration of the flight and not only during cloud-breaking.

Overall, the risk of mid-air collision may not be significantly affected by the option to fly under IFR and is worth taking to avoid other greater risks.

Focusing on desirable enhancements to the see-and-avoid principle, the following can be added:

Helicopters operated in on-shore environment typically have no ACAS II installed. The vast majority of electronic devices installed to enhance the see-and-avoid capability of the pilot have been certified under the 'no credit, no hazard' category. They have been demonstrated to create no new risk to the helicopter. They cannot be used to meet operational or airspace requirements.

If operators that most need to improve the see-and-avoid capability already have installed such devices on a voluntary basis, the impact of mandatory installation electronic enhancements might be:

— for the operators that most need them: high cost–low benefit (the benefit would be limited to the greater capability of the new device);

— for the other operators: high cost–low benefit (as these operators don't need an electronic enhancement so much).

This NPA does not propose to mandate such piece of equipment in the AIR OPS Regulation. The costs and benefits are likely to be better assessed under the risk assessments of the operator and the designated ATS provider.

When considering only the navigation performance perspective, RNP 0.3 with helicopters is sufficiently covered by the ICAO PBN Manual, which is already referred to in SPA.PBN. Operator risk assessments are already required under Part-ORO of the AIR OPS Regulation.

This NPA proposes no additional AMC and GM to SPA.PBN for helicopters.

Navigation aids at closed aerodromes

Helicopter operators may find it useful to be able to use conventional navigation aids at closed aerodromes for the purpose of planning IFR flights. This could include aerodromes outside their normal opening hours at night and at times when the aerodrome is closed by NOTAM in order to:

— fly a cloud-breaking procedure and continue the flight to another destination under VFR;

— use the aerodrome as an alternate.

Helicopter operators should discuss with the aerodrome operators and ANS providers locally to see whether the services they need can be made available, and to ensure that they receive clear information on what they can and cannot do.

This document proposes no change regarding the use of navigation aids at closed aerodromes.

2.5. What are the expected benefits and drawbacks of the proposals

This NPA proposes to remove the regulatory obstacles to perform IFR flights with helicopters by offering new non-mandatory options. The new options are made safe by attaching a number of conditions to their implementation.

The safety level of each new option is assessed in Chapter 3 of the explanatory note, and is compared to the current safety level.

Operators may implement the proposed options on a voluntary basis. They bear no mandatory costs. Operators may incur costs when implementing the new options: they will do so if their own analysis identifies that the operational and safety benefits are greater than the costs.

The different options are made available to NCC, NCO and SPO operators as much as practicable. There are no proportionality issues.

The overall safety outcome is expected to be positive, as at least some operators are expected to implement the proposed options. They will fly more under IFR and less under VFR in marginal conditions. Their exposure to one of the major risks of helicopter accidents will be reduced.

2.6. How do we monitor and evaluate the rules

Monitoring is a continuous and systematic process of data collection and analysis with regard to the implementation/application of a rule/activity. It generates factual information for future possible evaluations and impact assessments and helps to identify actual implementation issues. For this NPA, EASA proposes the following monitoring plan:

What to monitor	**How to monitor**	**Who should monitor**	**How often to monitor**
Number of helicopter accidents under VFR in marginal VMC	Reports in ECCAIRS and information collected at Member State level	EASA and NAAs	Every 2 years
Number of helicopter operators implementing the proposed options	Survey to NAAs/helicopter operators --- Number of specific approvals granted by NAAs	EASA/ NAAs	To be defined
Number of helicopter missions taking place under IFR that might otherwise have been flown under VFR.	Survey to helicopter operators	EASA/ NAAs	To be defined

3. Proposed amendments and rationale in detail

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

deleted text is ~~struck through~~;

new or amended text is highlighted in blue;

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

3.1. Draft regulation (draft EASA opinion)

ANNEX I

Definitions for terms used in Annexes II to VIII

1. Definitions are amended as follows:

'instrument approach operation' means an approach and landing using instruments for navigation guidance based on an IAP. There are two methods for conducting instrument approach operations:

(a) 2D instrument approach operation, using lateral navigation guidance only; and

(b) 3D instrument approach operation, using both lateral and vertical navigation guidance;

'instrument approach procedure (IAP)' means a series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix or, where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. IAPs are classified as follows:

(a) non-precision approach (NPA) procedure, which means an IAP designed for 2D instrument approach operations Type A;

(b) approach procedure with vertical guidance (APV) means a performance-based navigation (PBN) IAP designed for 3D instrument approach operations Type A;

(c) precision approach (PA) procedure means an IAP based on navigation systems designed for 3D instrument approach operations Type A or B;

'low-visibility operations (LVOs)' means approach or take-off operations on a runway with any RVR less than 550 m or taxiing at an aerodrome at which any RVR is less than 550 m; for helicopters, the RVR shall be less than 500 m;

'Type A instrument approach operation' means an operation with an MDA/H or a DA/H at or above 250 ft;

'Type B instrument approach operation' means an operation with a minimum DA/H below 250 ft. Type B instrument approach operations are categorised as:

(a) Category I (CAT I): a DA/H not lower than 200 ft and with either a visibility not less than 800 m or an RVR not less than 550 m. For helicopters, the RVR shall not be less than 500 m;

(b) Category II (CAT II): a DH lower than 200 ft but not lower than 100 ft, and an RVR not less than 300 m;

(c) Category III (CAT III): a DH lower than 100 ft or no DH, and an RVR less than 300 m or no RVR limitation;

'visibility' means visibility for aeronautical purposes, which is the greater of:

(a) the greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognised when observed against a bright background; and

(b) the greatest distance at which lights in the vicinity of 1 000 candelas can be seen and identified against an unlit background;

Explanatory note to 'Definitions'

The definitions of the different approach types are presented here as published in NPA 2018-06(C). These new definitions are useful throughout the document. Only the definition of 'Category I' is amended for helicopters because the lowest RVR for CAT I with helicopters has always been 500 m.

Increasing helicopter operating minima is envisaged, not only for the purpose of alignment with aeroplanes, but also for consistency with the aerodrome regulations proposed with NPA 2018-06(D).

With a 500-m RVR cut-off, there will be situations where:

— the operating minima are met and the pilot-in-command will expect to land;

— low-visibility procedures will not be in force at the aerodrome;

— the pilot-in-command will not be cleared to land.

With a 550-m RVR, these situations will occur only within a specific approval, where additional knowledge and training will address the issue.

Question to stakeholders:

Should the minimum RVR without a SPA.LVO approval for helicopter Type B CAT I approaches and low-visibility take-offs be:

— 500 m, or

— 550 m?

ANNEX V

SPECIFIC APPROVALS

[Part-SPA]

SUBPART E

LOW VISIBILITY OPERATIONS (LVO)

2. SPA.LVO.100 is amended as follows:

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

The operator shall only conduct the following operations when they are approved by the competent authority:

(a) standard take-off operations with visibility conditions less than 400-m RVR;

(b) standard approach operations with visibility conditions less than 550-m RVR, or for helicopters 500-m RVR; and

(c) operations with operational credits.

Explanatory note to SPA.LVO.100

SPA.LVO.100 is presented here as published in NPA 2018-06(C). The minimum RVR without an LVO is amended for helicopters because the lowest RVR for CAT I with helicopters has always been 500 m. Increasing helicopter operating minima is envisaged, not only for the purpose of alignment with aeroplanes, but also for consistency with the aerodrome regulations proposed with NPA 2018-06(D).

SUBPART H

HELICOPTER OPERATIONS WITH NIGHT VISION IMAGING SYSTEMS

3. SPA.NVIS.120 is amended as follows:

SPA.NVIS.120 NVIS operating minima

(a) Operations shall not be conducted below the ~~VFR~~ weather minima for the type of night operations being conducted.

(b) The operator shall establish the minimum transition height from where a change to/from aided flight may be continued.

Explanatory note to SPA.NVIS.120

This amendment is intended to achieve the specific objective described under Section 2.3.1: Enable onshore IFR operations by providing additional options: Use of NVIS on the visual segment of an IFR flight.

The amended regulation maintains the principle that there will be no operational credit for NVIS, but it no longer restricts the use of NVIS to VFR weather minima.

SUBPART K

HELICOPTER OFFSHORE OPERATIONS

4. SPA.HOFO.125 is amended as follows:

SPA.HOFO.125 ~~Airborne radar approaches (ARAs) to offshore locations — CAT operations~~ Offshore standard approach procedures (OSAPs)

(a) ~~A commercial air transport (CAT)~~An operator shall establish ~~operational~~ procedures ~~and~~to ensure that ~~ARAs~~offshore standard approach procedures (OSAPs) are only flown if:

(1) the helicopter is ~~equipped with a radar that is~~ capable of providing ~~information regarding the~~navigation and real-time obstacle environment information for obstacle clearance; and

(2) either:

(i) the minimum descent height (MDH) is determined from a radio altimeter or a device that provides equivalent performance; or

(ii) the minimum descent altitude (MDA) ~~plus an adequate margin~~ is applied and it includes an adequate margin.

(b) ~~ARAs~~OSAPs to rigs or vessels in transit shall be flown as multi-pilot operations.

(c) The decision range shall provide adequate obstacle clearance in the missed approach from any destination for which an ~~ARA~~OSAP is planned.

(d) The approach shall only be continued beyond decision range or below the minimum descent altitude/height (MDA/H) when visual reference to the destination has been established.

(e) For single-pilot ~~CAT~~ operations, appropriate increments shall be added to the MDA/H and decision range.

(f) When an ~~ARA~~OSAP is flown to a non-moving offshore location (i.e. fixed installation or moored vessel) and a reliable ~~GPS~~GNSS position for the location is available in the navigation system, the ~~GPS~~GNSS/area navigation system shall be used to enhance the safety of the ~~ARA~~OSAP.

(g) The operator shall include OSAP in its initial and recurrent training and checking programmes.

Explanatory note to SPA.HOFO.125

This amendment is proposed to achieve the specific objective described in Section 2.3.2: Modernise offshore radar approaches. The main change in the implementing rule is the extension of the scope of the point to NCC and SPO offshore operations and is described in Section 2.3.2. The amendment also meets objective 2.3.3 by making the implementing rule more performance based and less technology oriented.

5. The following Subpart N is added in Part-SPA:

SUBPART N

HELICOPTER POINT IN SPACE APPROACHES AND DEPARTURES WITH REDUCED VFR MINIMA

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

(a) The operator shall only use reduced VFR operating minima if the operator has been granted an approval by the competent authority.

(b) Reduced VFR operating minima shall apply only to the VFR segment of a flight that also includes an IFR segment, and only in one of the following cases:

(1) The VFR segment of the flight takes place immediately after a helicopter PinS approach with the intention to land at a nearby heliport or operating site.

(2) The VFR segment of the helicopter flight is a departure with the intention to transition to IFR at a nearby initial departure fix.

(c) The operator shall define operating procedures applicable when flying with reduced VFR operating minima.

(d) The operator shall ensure that the flight crew is experienced and trained to operate with reduced minima.

Explanatory note to SPA.PINS-VFR.100

This new specific approval is intended to achieve the specific objective described in Section 2.3.1: Enable onshore IFR operations by providing additional options: Reduced minima on mixed IFR/VFR flights.

In some weather conditions, especially at night, the ceiling and visibility allow to see the destination from the missed approach point (MAPt) of a point-in-space (PinS) approach. The approach design may require the pilot to 'proceed VFR' from the MAPt. Yet the weather conditions may be IMC.

Conversely, in some weather conditions, the ceiling and visibility allow to see an IFR instrument departure fix before take-off. The design of the instrument departure may require the pilot to 'proceed VFR' to the initial departure fix (IDF). Yet the weather conditions may be IMC.

It is proposed to reduce the VFR minima in such cases. The short segment of VFR flight remains VFR, which means the crew requires specific training and experience. The safety is expected to be increased because:

— the larger part of the flight will take place under IFR, not under marginal VMCs;

— decision-making is expected to be simplified:

  — on landing, the decision to continue VFR depends on the availability of the expected visual cues; a go-around is always a safe option;

  — on departure, the decision to take off under VFR can be thought over and also depends on the availability of the expected visual cues.

ANNEX VI

NON-COMMERCIAL AIR OPERATIONS WITH COMPLEX MOTOR-POWERED AIRCRAFT

[PART-NCC]

6. The following NCC.OP.148 is inserted:

NCC.OP.148 Destination alternate aerodrome planning minima — helicopters

The operator shall only select an aerodrome as a destination alternate aerodrome if the available current meteorological information indicates, for the period from 1 hour before until 1 hour after the estimated time of arrival, or from the actual time of departure to 1 hour after the estimated time of arrival, whichever is the shorter period:

(a) for an alternate aerodrome with an instrument approach procedure:

  (1) a ceiling of at least 200 ft above the decision height (DH) or minimum descent height (MDH) associated with the instrument approach procedure; and

  (2) a visibility of at least 1 500 m by day or 3 000 m by night; or

(b) for an alternate aerodrome without an instrument approach procedure:

  (1) a ceiling of at least 2 000 ft or the minimum safe IFR height, whichever is greater; and

  (2) a visibility of at least 1 500 m by day or 3 000 m by night.

Explanatory note to NCC.OP.148 and SPO.OP.143

Under NCO, NCC and SPO, a flight can depart towards its destination with that destination below aerodrome operating minima and a single alternate forecast to be at or just above aerodrome minima. A minor deterioration in the weather could leave the flight with no safe landing options.

EASA proposes to introduce such planning minima to reflect best practice. The proposal is planned to be extended to NCO under the future NCO sub-NPA for all weather operations.

ANNEX VIII

SPECIALISED OPERATIONS

[Part-SPO]

7. The following SPO.OP.101 is inserted:

SPO.OP.101 Altimeter check and settings

(a) The operator shall establish procedures for altimeter checking before each departure.

(b) The operator shall establish procedures for altimeter settings for all phases of flight. If the State of the aerodrome or the State of the airspace has prescribed a different procedure from that established by the operator, that procedure shall be taken into account by the operator.

Explanatory note to SPO.OP.101
The intent is full alignment with NCC. See NPA 2018-06(C).

8. SPO.OP.110 is amended as follows:

SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

~~(a) For instrument flight rules (IFR) flights, the operator or the pilot-in-command shall specify aerodrome operating minima for each departure, destination and alternate aerodrome to be used. Such minima shall:~~

~~(1) not be lower than those established by the State in which the aerodrome is located, except when specifically approved by that State; and~~

~~(2) when undertaking low visibility operations, be approved by the competent authority in accordance with Annex V (Part-SPA), Subpart E to Regulation (EU) No 965/2012.~~

~~(b) When specifying the aerodrome operating minima, the operator or the pilot-in-command shall take the following into account:~~

~~(1) the type, performance and handling characteristics of the aircraft;~~

~~(2) the competence and experience of the flight crew and, if applicable, its composition;~~

~~(3) the dimensions and characteristics of the runways and final approach and take-off areas (FATOs) that may be selected for use;~~

~~(4) the adequacy and performance of the available visual and non-visual ground aids;~~

~~(5) the equipment available on the aircraft for the purpose of navigation and/or control of the flight path, during the take-off, the approach, the flare, the landing, the rollout and the missed approach;~~

~~(6) the obstacles in the approach, the missed approach and the climb-out areas required for the execution of contingency procedures;~~

~~(7) the obstacle clearance altitude/height for the instrument approach procedures;~~

~~(8) the means to determine and report meteorological conditions; and~~

~~(9) the flight technique to be used during the final approach.~~

~~(c) The minima for a specific type of approach and landing procedure shall only be used if:~~

~~(1) the ground equipment required for the intended procedure is operative;~~

~~(2) the aircraft systems required for the type of approach are operative;~~

~~(3) the required aircraft performance criteria are met; and~~

~~(4) the flight crew is qualified appropriately.~~

(a) The operator shall establish aerodrome operating minima for each departure, destination or alternate aerodrome planned to be used in order to ensure separation of the aircraft from terrain and obstacles and to mitigate the risk of loss of visual references during the visual flight segment of instrument operations.

(b) The method used to establish aerodrome operating minima shall take the following elements into account:

(1) the type, performance and handling characteristics of the aircraft;

(2) the equipment available on the aircraft for the purpose of navigation, acquisition of visual references and/or control of the flight path during take-off, approach, landing and missed approach;

(3) any conditions or limitations stated in the aircraft flight manual (AFM);

(4) the dimensions and characteristics of the runways/final approach and take-off area (FATO) that may be selected for use;

(5) the adequacy and performance of the available visual and non-visual aids and infrastructure;

(6) the obstacle clearance altitude/height (OCA/H) for the instrument approach procedures (IAPs);

(7) the obstacles in the climb-out areas and the necessary clearance margins;

(8) any non-standard characteristics of the aerodrome, the IAP or the local environment;

(9) the composition of the flight crew, their competence and experience;

(10) the IAP;

(11) the aerodrome characteristics and the available ANS;

(12) any minima that may be promulgated by the State of the aerodrome;

(13) the conditions prescribed in any specific approvals for LVOs or operations with operational credits; and

(14) the relevant operational experience of the operator.

(c) The operator shall specify a method of determining aerodrome operating minima in the operations manual.

Explanatory note to SPO.OP.110

The intent is full alignment with Part-NCC. See NPA 2018-06(C).

9. SPO.OP.111 is deleted.

~~SPO.OP.111 Aerodrome operating minima — NPA, APV, CAT I operations~~

Explanatory note to SPO.OP.111

This point is proposed to be deleted. Its contents are moved to new AMC5 for consistency with Part-NCC and Part-CAT. SPO.OP.110(c) provides sufficient high-level requirements in the rule to introduce this AMC. See NPA 2018-06(C).

10. SPO.OP.112 is amended as follows:

SPO.OP.112 Aerodrome operating minima — circling operations with aeroplanes

(a) The MDH for a circling approach operation with aeroplanes shall not be lower than the highest of:

(1) the published circling OCH for the aeroplane category;

(2) the minimum circling height derived from Table 1; or

(3) the DH/MDH of the preceding ~~instrument approach procedure~~ IAP.

(b) The minimum visibility for a circling approach operation with aeroplanes shall be the highest of:

(1) the circling visibility for the aeroplane category, if published; or

(2) the minimum visibility derived from Table ~~2;~~1. ~~or~~

~~(3) the runway visual range/converted meteorological visibility (RVR/CMV) of the preceding instrument approach procedure.~~

Table 1

MDH and minimum VIS for circling v~~s~~ aeroplane category

	Aeroplane category			
	A	B	C	D
MDH (ft)	400	500	600	700
Minimum ~~meteorological visibility~~ VIS (m)	1 500	1 600	2 400	3 600

Explanatory note to SPO.OP.112

The amendment impacts on aeroplanes only and aligns the wording with that of NPA 2018-06(C).

11. The following SPO.OP.143 is inserted:

SPO.OP.143 Destination alternate aerodrome planning minima — helicopters

The operator shall only select an aerodrome as a destination alternate aerodrome if the available current meteorological information indicates, for the period from 1 hour before until 1 hour after the estimated time of arrival, or from the actual time of departure to 1 hour after the estimated time of arrival, whichever is the shorter period:

(a) for an alternate aerodrome with an instrument approach procedure:

(1) a ceiling of at least 200 ft above the decision height (DH) or minimum descent height (MDH) associated with the instrument approach procedure; and

(2) a visibility of at least 1 500 m by day or 3 000 m by night; or

(b) for an alternate aerodrome without an instrument approach procedure:

(1) a ceiling of at least 2 000 ft or the minimum safe IFR height, whichever is greater; and

(2) a visibility of at least 1 500 m by day or 3 000 m by night.

Explanatory note to SPO.OP.143

See point NCC.OP.148.

12. SPO.OP.180 is amended as follows:

SPO.OP.180 Take-off conditions — aeroplanes and helicopters

Before commencing take-off, the pilot-in-command shall verify ~~be satisfied~~ that:

(a) ~~according to the information available, the weather~~ the meteorological conditions at the aerodrome or the operating site and the condition of the runway or FATO intended to be used will ~~would~~ not prevent a safe take-off and departure; and

~~(b) applicable aerodrome operating minima will be complied with.~~

(b) the selected aerodrome operating minima are consistent with:

(1) the operative ground equipment;

(2) the operative aircraft systems;

(3) the aircraft performance; and

(4) flight crew qualifications.

13. SPO.OP.210 is amended as follows:

SPO.OP.210 Approach and landing conditions — aeroplanes and helicopters

Before commencing an approach operation ~~to land~~, the pilot-in-command shall verify ~~be satisfied~~ that: ~~, according to the information available, the weather~~

(a) the meteorological conditions at the aerodrome or the operating site and the condition of the runway/~~or~~ FATO intended to be used will ~~would~~ not prevent a safe approach, landing or ~~missed approach~~ go-around, considering the performance information contained in the operations manual; and

(b) the selected aerodrome operating minima are consistent with:

(1) the operative ground equipment;

(2) the operative aircraft systems;

(3) the aircraft performance; and

(4) flight crew qualifications.

14. SPO.OP.215 is amended as follows:

SPO.OP.215 Commencement and continuation of approach ~~— aeroplanes and helicopters~~

~~(a) The pilot-in-command may commence an instrument approach regardless of the reported runway visual range/visibility (RVR/VIS).~~

~~(b) If the reported RVR/VIS is less than the applicable minimum the approach shall not be continued:~~

~~(1) below 1 000 ft above the aerodrome; or~~

~~(2) into the final approach segment in the case where the decision altitude/height (DA/H) or minimum descent altitude/height (MDA/H) is more than 1 000 ft above the aerodrome.~~

~~(c) Where the RVR is not available, RVR values may be derived by converting the reported visibility.~~

~~(d) If, after passing 1 000 ft above the aerodrome, the reported RVR/VIS falls below the applicable minimum, the approach may be continued to DA/H or MDA/H.~~

~~(e) The approach may be continued below DA/H or MDA/H and the landing may be completed provided that the visual reference adequate for the type of approach operation and for the intended runway is established at the DA/H or MDA/H and is maintained.~~

~~(f) The touchdown zone RVR shall always be controlling.~~

(a) If the reported visibility or controlling RVR for the runway to be used for landing is less than the applicable minimum, then an instrument approach operation shall not be continued:

(1) past a point at which the aircraft is 1 000 ft above the aerodrome elevation; or

(2) if the DH or MDH is higher than 1 000 ft into the FAS.

(b) If the required visual reference is not established, a missed approach shall be executed at or before the DA/H or the MDA/H.

(c) If the required visual reference is not maintained after the DA/H or the MDA/H, a go-around shall be executed promptly.

Explanatory note to SPO.OP.215, AMC1 SPO.OP.215, GM1 SPO. OP.215, AMC1 SPO.OP.215(a) and AMC1 SPO.OP.215(b)

These amendments are proposed for consistency with Part-CAT and Part-NCC.

It remains forbidden to continue the approach below 1 000 ft, or to continue into the final segment if the (M)DH is higher than 1 000 ft, if an RVR or VIS is available and below the operating minima.

If no RVR or VIS is available, which is typical of PinS approaches, then it is not forbidden do continue to the (M)DA/H. The amendment will enable PinS approaches to be flown below 1 000 ft.

15. The following SPO.OP.235 is inserted:

SPO.OP.235 Enhanced flight vision system (EFVS) 200 operations

An operator that intends to conduct EFVS 200 operations with operational credits and without a specific approval, shall ensure that:

(a) the aircraft is certified for the intended operations;

(b) only runways and IAPs suitable for EFVS operations are used;

(c) the flight crew are competent to conduct the intended operation and that a training and checking programme for the flight crew members and relevant personnel involved in the flight preparation is established;

(d) operating procedures are established;

(e) any relevant information is documented in the minimum equipment list (MEL);

(f) any relevant information is documented in the maintenance programme;

(g) safety assessments are carried out and performance indicators are established to monitor the level of safety of the operation; and

(h) the aerodrome operating minima take into account the capability of the system used.

Explanatory note to SPO.OP.235

Operational credits for EFVS 200 operations were developed for NPA 2018-06(C). The operational credits available under Part-NCC are proposed to be extended under Part-SPO.

3.2. Draft acceptable means of compliance and guidance material (draft EASA decision)

ANNEX IV

COMMERCIAL AIR TRANSPORT OPERATIONS

[PART-CAT]

16. AMC2 CAT.OP.MPA.110 is amended as follows:

AMC2 CAT.OP.MPA.110 Aerodrome operating minima

TAKE-OFF OPERATIONS — HELICOPTERS

(a) General

(1) Take-off minima should be expressed as ~~visibility~~ VIS or ~~runway visual range (~~RVR~~)~~ limits, taking into account all relevant factors for each aerodrome or operating site planned to be used and aircraft characteristics. Where there is a specific need to see and avoid obstacles on departure, ~~and/or~~ for a forced landing, additional conditions, or both, e.g. ceiling, should be specified.

(2) The commander should not commence take-off unless the ~~weather~~ meteorological conditions at the aerodrome or operating site of departure are equal to or better than the applicable minima for landing at that aerodrome or operating site unless a weather-permissible take-off alternate aerodrome is available.

(3) When the reported ~~meteorological visibility (~~VIS~~)~~ is below that required for take-off and the RVR is not reported, a take-off should only be commenced if the commander can determine that the visibility or RVR along the take-off runway/area is equal to or better than the required minimum.

(4) When no reported ~~meteorological visibility~~ VIS or RVR is available, a take-off should only be commenced if the commander can determine that the visibility along the take-off runway/area is equal to or better than the required minimum.

(b) Visual reference

(1) The take-off minima should be selected to ensure sufficient guidance to control the aircraft in the event of both a rejected take-off in adverse circumstances and a continued take-off after failure of the critical engine.

(2) For night operations, ground lights should be available to illuminate the take-off runway/final approach and take-off area (FATO) and any obstacles.

(3) For point-in-space (PinS) departures to an initial departure fix (IDF), the take-off minima should be selected to ensure sufficient guidance to see and avoid obstacles and return to the heliport if the flight cannot be continued visually to the IDF.

(c) Required RVR~~/~~ or VIS — helicopters~~:~~

(1) For performance class 1 operations, the operator should specify an RVR~~/~~ or a VIS as take-off minima in accordance with Table 1.H.

(2) For performance class 2 operations onshore, the commander should operate to take-off minima of 800 m RVR~~/~~ or VIS and remain clear of cloud during the take-off manoeuvre until reaching performance class 1 capabilities.

(3) For performance class 2 operations offshore, the commander should operate to minima not less than ~~that~~ those for performance class 1 and remain clear of cloud during the take-off manoeuvre until reaching performance class 1 capabilities.

~~(4) Table 8 for converting reported meteorological visibility to RVR should not be used for calculating take-off minima.~~

Table 1.H

Take-off — helicopters (without LVTO approval) RVR/VIS

Onshore aerodromes with instrument flight rules (IFR) departure procedures	**RVR/VIS (m) ****
No light and no markings (day only)	400 or the rejected take-off distance, whichever is the greater
No markings (night)	800
Runway edge/FATO light and centre line marking	400
Runway edge/FATO light, centre line marking and relevant RVR information	400
Offshore helideck *	
Two-pilot operations	400
Single-pilot operations	500

*~~:~~ The take-off flight path to be free of obstacles.

** On PinS departures to an initial departure fix (IDF), RVR should be not less than 800 m and the ceiling should not be less than 250 ft.

Explanatory note to AMC2 CAT.OP.MPA.110

This amendment is intended to achieve the specific objective described in Section 2.3.3: Implementation of the new definition; Minor changes to reflect the operational capabilities of helicopters; Introduction of helicopter PinS approaches to reflect the recent evolution of ICAO Doc 8168 (PANS-OPS), and simplification.

Paragraph (b)(iii) and footnote (**) to Table 1.H:

By procedure design, it is required to maintain the capability to manoeuvre and land in case of any unforeseen event during the visual segment to the IDF. The operating minima of the helicopter circling manoeuvre are proposed.

Other changes:

The other changes are editorial corrections and are proposed to standardise the wording of the helicopter regulatory material following the changes to the aeroplane regulations as per NPA 2018-06(C).

17. AMC3 CAT.OP.MPA.110 is amended as follows:

AMC3 CAT.OP.MPA.110 Aerodrome operating minima

NPA, APV, CAT I OPERATIONS ~~-~~— HELICOPTERS

(a) The decision height (DH) or minimum descent height (MDH) to be used for a 3D or a 2D approach operation ~~non-precision approach (NPA) flown with the continuous descent final approach (CDFA) technique, approach procedure with vertical guidance (APV) or category (CAT) I operation~~ should not be lower than the highest of:

(1) the obstacle clearance height (OCH) for the category of aircraft used;

(2) the published approach procedure DH or MDH where applicable;

(3) the system minimum specified in Table 3.H;

(4) the minimum DH permitted for the runway/FATO specified in Table 4.H; or

(5) the minimum DH specified in the AFM or equivalent document, if stated.

~~(1) the minimum height to which the approach aid can be used without the required visual reference;~~

~~(2) the obstacle clearance height (OCH) for the category of aircraft;~~

~~(3) the published approach procedure DH where applicable;~~

~~(4) the system minimum specified in Table 3; or~~

~~(5) the minimum DH specified in the aircraft flight manual (AFM) or equivalent document, if stated.~~

~~(b) The minimum descent height (MDH) for an NPA operation flown without the CDFA technique should not be lower than the highest of:~~

~~(1) the OCH for the category of aircraft;~~

~~(2) the system minimum specified in Table 3; or~~

~~(3) the minimum MDH specified in the AFM, if stated.~~

Table 3.H

System minima

Facility	Lowest DH/MDH (ft)
ILS/MLS/GLS	200
GNSS/SBAS (LPV) *	200
GNSS (LNAV)	250
GNSS/Baro-VNAV (LNAV/VNAV)	250
Helicopter point-in-space (PinS) approach	250**
LOC with or without DME	250
SRA (terminating at ½ NM)	250
SRA (terminating at 1 NM)	300
SRA (terminating at 2 NM or more)	350
VOR	300
VOR/DME	250
NDB	350
NDB/DME	300
VDF	350

* For LPV, a DH of 200 ft may be used only if the published FAS datablock sets a vertical alert limit not exceeding 35 m. Otherwise, the DH should not be lower than 250 ft.

** For point-in-space (PINs) approaches with instructions to 'proceed VFR', the DH or MDH should be with reference to the ground below the missed approach point (MAPt).

DME: distance-measuring equipment;

GNSS: global navigation satellite system;

ILS: instrument landing system;

LNAV: lateral navigation;

LOC: localiser;

LPV: localiser performance with vertical guidance

SBAS: satellite-based augmentation system;

SRA: surveillance radar approach;

VDF: VHF direction finder;

VNAV: vertical navigation;

VOR: VHF omnidirectional radio range.

Table 4.H: Type of runway/FATO v lowest DH/MDH — HELICOPTERS

Type of runway/FATO	Lowest DH/MDH (ft)
Precision approach runway, Category I Non-precision approach runway Non-instrument runway	200 ft
Instrument FATO FATO	200 ft 250 ft

Note: A helicopter point-in-space (PinS) approach with instructions to 'proceed VFR' is not directly related to the nearest FATO or runway, because the flight can continue VFR to any destination after the PinS.

Table 4.H does not apply to helicopter PinS approaches with instructions to 'proceed VFR'.

Explanatory note

This amendment is intended to achieve the specific objective described in Section 2.3.3: Implementation of the new definitions; Minor changes to reflect the operational capabilities of helicopters; Introduction of helicopter PinS approaches to reflect the recent evolution of ICAO Doc 8168 (PANS-OPS), and simplification.

Explanatory note to paragraph (a)

For helicopters, a specific paragraph is required to introduce the calculation of the decision heights and minimum descent heights because of the following:

Helicopter operators need to refer to separate calculation tables. Table 3.H happens to be the same as Table 3.A, but Table 4.H is not. See explanatory note to Tables 4.H and 9.1.H.

Helicopter operating minima need not distinguish between Type A approaches using CDFA, Type A approaches not using CDFA, and Type B approaches: see below.

The CDFA technique, together with the concept of stabilised approaches, has substantially improved safety performance of commercial air transport with large and turbine-powered aircraft. Helicopters are lighter and more manoeuvrable and the concept of stabilised approaches is slightly different. There may sometimes be advantages to a step-down technique. Helicopters are also capable of shorter and steeper visual approaches, and helicopter PinS approaches may require the descent angle on the visual segment to be different to the descent angle on the final approach segment.

Helicopter operating minima should not be increased when not using the CDFA technique.

Conversely, if a helicopter operator uses the CDFA technique, a DH will be used instead of an MDH. The approach may be continued to DH or the MAPt (whichever earlier), at which point a missed approach must be initiated if visual reference is not acquired. The helicopter may descend briefly below the DH on an NPA flown using CDFA, in the same way as it may do on a precision approach or APV. With a helicopter, the height loss at DH is negligible compared to that of an aeroplane, because of the lower speeds involved, the lower inertia, the higher manoeuvrability and vertical acceleration.

With helicopters, there is no need to add an increment to the MDH when converting it into a DH for the purpose of using the CDFA technique.

In addition, the calculation of the minimum DH or MDH is different to aeroplanes. See explanatory note to Tables 4.H and 9.1.H.

Explanatory note to Table 3.H

Table 3.H is based on Table 3.A with the addition of 'helicopter PinS procedures'.

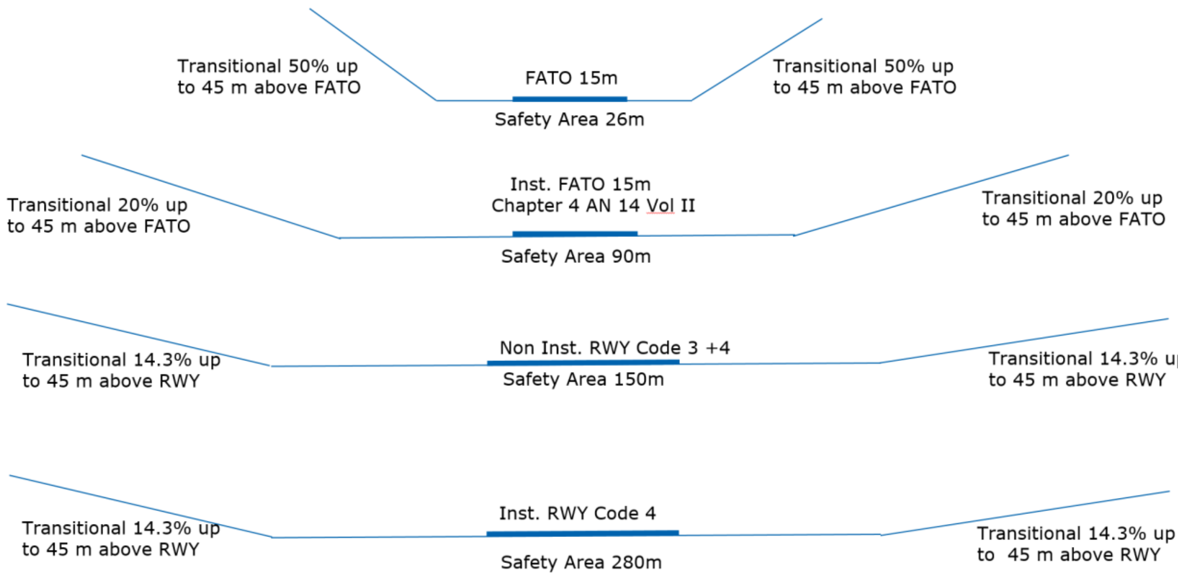
The system minima are not aircraft related. PinS approach is a separate kind of approach in PANS-OPS, so it needs to be introduced in the list of approach types.

PinS approaches with instructions to 'proceed VFR' are cloud-breaking procedures that may be used to continue flight under VFR to an unspecified destination. As opposed to other IFR procedures, it may not be possible to determine the DH/MDH with reference to a given heliport or runway threshold. An alternative solution is proposed in a footnote.

Explanatory note to Tables 4.H and 9.1.H

The minimum RVR for helicopters is 500 m.

Runways: The obstacle protection of a non-instrument runway is far greater than the obstacle protection of an instrument FATO. There should therefore be no increase in the minima based on the type of runway. Any runway is also much bigger than an instrument FATO. No increase in the operating minima should apply.



Instrument FATO: The obstacle protection, lighting and minimum dimensions of an instrument heliport should be sufficient to avoid any increase in the operating minima. No increase in the operating minima should apply.

Non-instrument FATO: A helicopter PinS approach can be designed to a non-instrument FATO with instructions to 'proceed visually'. Table 4.H sets a minimum DH no lower than that of a PinS approach for non-instrument FATOs.

The minimum distance from the MAPt to the heliport is 1 000 m, in order to provide enough distance for the helicopter to decelerate from the IFR speed and land, under the current procedure design provisions of helicopter PinS approaches with instructions to 'proceed visually'.

Paragraph (h)(1) ensures the minimum RVR is 1 000 m.

This NPA proposes that the RVR or VIS should be no lower than 800 m as per Table 9.1.H to cover any deficiency in lighting or heliport dimensions and any possible changes in the procedure design provisions.

18. AM6 CAT.OP.MPA.110 is renumbered and amended as follows (note: the former AMC5 is proposed to be deleted by NPA 2018-06(C)):

AMC5 ~~AMC6~~ CAT.OP.MPA.110 Aerodrome operating minima

DETERMINATION OF RVR/CMV/VIS MINIMA FOR INSTRUMENT APPROACH OPERATIONS — HELICOPTERS

~~(a) Helicopters~~

The RVR/CMV/VIS minima for Type A instrument approach, and Type B CAT I instrument approach operations should be determined as follows:

(a) The RVR/CMV should not be less than the greater of the following:

(1) the minimum RVR or VIS for the type of runway/FATO used according to Table 9.1.H; or

(2) the minimum RVR or VIS determined according to the MDH or DH and class of lighting facility according to Table 9.2.H.

(~~1~~b) For Type A instrument approach ~~operations operated in performance class 1 (PC1) or performance class 2 (PC2), the minima specified in Table. 6.1.H. should apply:~~

~~(i)~~ where the ~~missed approach point~~ MAPt is within ½ NM of the landing threshold, the approach minima specified for FALS may be used regardless of the length of the approach lights available. However, FATO/runway edge lights, threshold lights, end lights and FATO/runway markings are still required.~~;~~

~~(ii) for night operations, ground lights should be available to illuminate the FATO/runway and any obstacles; and~~

~~(iiic) for single-pilot operations of type A approaches, the minimum RVR should not be less than 800 m or the minima in Table 6.1.H9.1.H, whichever is higher.~~

~~(2) For CAT I instrument approach operations operated in PC1 or PC2, the minima specified in Table 6.2.H should apply:~~

~~(i) for night operations, ground light should be available to illuminate the FATO/runway and any obstacles;~~

~~(iid) for single-pilot operations of type B approaches, the minimum RVR/ or VIS should be calculated in accordance with the following additional criteria:~~

(~~A~~c) ~~a~~An RVR of less than 800 m should not be used except when using a suitable autopilot coupled to an ILS, an MLS, a ~~or~~ GLS or LPV, in which case normal minima apply.~~; and~~

~~(B) the DH applied should not be less than 1.25 times the minimum use height for the autopilot.~~

(d) For night operations, ground lights should be available to illuminate the FATO/runway and any obstacles.

(e) The visual aids should comprise standard runway day markings, runway edge lights, threshold lights and runway end lights and approach lights as specified in **Table 9.3.H**.

(f) For night operations or for any operation where credit for runway and approach lights as defined in Table 9.3.H is required, the lights should be on and serviceable.

(g) For point-in-space (PinS) operations, two kinds of procedures can be designed and used:

(1) PinS approaches with instructions to 'proceed visually' for which the RVR or VIS should be at least the distance between the MAPt of the PinS and the FATO;

(2) PinS approaches with instructions to 'proceed VFR': the RVR or VIS should be equal to the visual meteorological conditions (VMC) applicable in the airspace class where the PinS is designed.

~~**Table 6.1.H 7.1.H 9.1.H: Onshore Type A instrument approach minima**~~

~~MDH (ft) *~~	~~Facilities vs RVR/CMV (m) **, ***~~			
	~~FALS~~	~~IALS~~	~~BALS~~	~~NALS~~
~~250–299~~	~~600~~	~~800~~	~~1 000~~	~~1 000~~
~~300–449~~	~~800~~	~~1 000~~	~~1 000~~	~~1 000~~
~~450 and above~~	~~1 000~~	~~1 000~~	~~1 000~~	~~1 000~~

~~*: ‘MDH’ refers to the initial calculation of MDH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest 10 ft, which may be done for operational purposes, e.g. conversion to MDA.~~

~~**: The tables are only applicable to conventional approaches with a nominal descent slope of not greater than 4°. Greater descent slopes will usually require that visual glideslope guidance (e.g. precision approach path indicator (PAPI)) is also visible at the MDH.~~

~~***: FALS comprise FATO/runway markings, 720 m or more of high-intensity/medium-intensity (HI/MI) approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~IALS comprise FATO/runway markings, 420–719 m of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~BALS comprise FATO/runway markings, <420 m of HI/MI approach lights, any length of low intensity (LI) approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~NALS comprise FATO/runway markings, FATO/runway edge lights, threshold lights, FATO/runway end lights or no lights at all.~~

Table 9.1.H: Type of runway/FATO v minimum RVR — HELICOPTERS

Type of runway/FATO	Minimum RVR or VIS
Precision approach runway, Category I Non-precision approach runway Non-instrument runway	RVR 500 m
Instrument FATO FATO	RVR 500 m RVR/VIS 800 m

Note: A helicopter PinS with instructions to 'proceed VFR' is not directly related to the nearest FATO or runway, because the flight can continue VFR to any destination after the PinS.

Table 9.1.H does not apply to helicopter PinS approaches with instructions to 'proceed VFR'.

Table 9.2.H: Onshore helicopter instrument approach minima

DH/MDH (ft)	Facilities v RVR (m)			
	FALS	IALS	BALS	NALS
200	500	600	700	1 000
201–249	550	650	750	1 000
250–299	600*	700*	800	1 000
300 and above	750*	800	900	1 000

* Minima on 2D approach operations should be no lower than 800 m.

~~**Table 6.2.H 7.2.H 9.2.H: Onshore Type B CAT I instrument approach minima**~~

~~DH (ft) *~~	~~Facilities vs RVR/CMV (m) **, ***~~			
	~~FALS~~	~~IALS~~	~~BALS~~	~~NALS~~
~~200~~	~~500~~	~~600~~	~~700~~	~~1 000~~
~~201–250~~	~~550~~	~~650~~	~~750~~	~~1 000~~
~~251–300~~	~~600~~	~~700~~	~~800~~	~~1 000~~
~~301 and above~~	~~750~~	~~800~~	~~900~~	~~1 000~~

~~*: 'DH' refers to the initial calculation of DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest 10 ft, which may be done for operational purposes, e.g. conversion to DA.~~

~~**: The table is applicable to conventional approaches with a glideslope up to and including 4°.~~

~~***: FALS comprise FATO/runway markings, 720 m or more of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~IALS comprise FATO/runway markings, 420 - 719 m of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~BALS comprise FATO/runway markings, <420 m of HI/MI approach lights, any length of LI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~NALS comprise FATO/runway markings, FATO/runway edge lights, threshold lights, FATO/runway end lights or no lights at all.~~

Table 9.3.H: Approach lighting systems

Class of lighting facility	Length, configuration and intensity of approach lights
FALS	CAT I lighting system (HIALS ≥ 720 m) distance coded centre line, barrette centre line
IALS	Simple approach lighting system (HIALS 420–719 m) single source, barrette
BALS	Any other approach lighting system (HIALS, MALS or ALS 210–419 m)
NALS	Any other approach lighting system (HIALS, MALS or ALS < 210 m) or no approach lights

Note:

HIALS: high-intensity approach lighting system

MALS: medium-intensity approach lighting system

Explanatory note AMC5 CAT.OP.MPA.110

This amendment is intended to achieve the specific objective described in Section 2.3.3: Implementation of the new definitions; Minor changes to reflect the operational capabilities of helicopters; Introduction of helicopter PinS approaches to reflect the recent evolution of ICAO Doc 8168 (PANS-OPS), and simplification.

Explanatory note to paragraphs (a) to (h)

The aim is to:

— discuss Type A and Type B approaches and no longer NPA and CAT I, and use the same table for the determination of RVR/CMV minima in both cases;

— delete the reference to performance classes because they do not influence the operating minima defined in this AMC;

— simplify the structure of the paragraph;

— delete any restrictions for multi-pilot operations: the previous increments to operating minima for single-pilot operations are understood to be not relevant to helicopters; moreover, if the aircraft is certified for single-pilot operations under IFR and the single pilot is capable and trained, then the minima should be the same in accordance with the performance-based principles. This approach is being implemented to aeroplane operations as per NPA 2018-06(C).

Explanatory note to Table 9.1.H

See explanatory note to Table 4.H under AMC3 CAT.OP.MPA.110.

Explanatory note to Table 9.2.H

Table 9.2.H is a merger of previous Tables 4.1.H and 4.2.H. For DH/MDH of 250 ft or above, the lowest minima are kept in the table, but minima no lower than 800 m for 2D operations are introduced in a footnote. Minima are also no lower than 800 m on helicopter PinS approaches.

The merged table provides simplicity and compatibility with the new definitions of Type A and Type B approaches, and 3D and 2D operations.

The merger process has marginally lowered the operating minima on 2D operations. The resulting minima remain within 800–1 000-m RVR, which is not very different to the 800-m VIS under VFR by day and is therefore safe.

A footnote restricting the descent angle to 4 degrees unless visual aids were available in the visual segment was deleted, taking into account a helicopter's ability to fly steeper descent angles with and without visual aids.

A footnote providing guidance on rounding the DA/MDA to the nearest 10 ft was deleted from this AMC on DH/MDH calculations.

Initially, an additional restriction to 800-m VIS or RVR was considered for PinS approaches. It was not introduced in the AMC because the intended safety feature is already embedded in other provisions:

— The lowest RVR is 800 m unless the PinS is flown to an instrument FATO or a runway as per Table 9.1.H.

— The lowest RVR is 800 m unless the PinS is a 3D approach operation and a full or intermediate approach light system is available, considering Table 3.H (minimum DH for PinS is 250 ft) and Table 9.2.H.

— The lowest RVR if a 'circling for helicopters' manoeuvre is needed is 800 m under AMC7 (former AMC8) CAT.OP.MPA.110 below.

— In the unlikely case where the PinS is a straight-in 3D approach operation to a runway or instrument FATO, using a full or intermediate approach light system, then the operating minima need not be restricted to 800 m.

The resulting minima are the same as for CAT and NCO, except that CMV is not used for NCO.

Table 9.3.H

Table 9.3.H is an editorial change that is proposed to standardise the wording of the helicopter regulatory material following the changes to the aeroplane regulations as per NPA 2018-06(C). This document does not propose to change the content.

19. AMC8 CAT.OP.MPA.110 is renumbered and amended as follows:

AMC7 ~~AMC8~~ CAT.OP.MPA.110 Aerodrome operating minima

ONSHORE CIRCLING OPERATIONS — HELICOPTERS

For circling, the specified MDH should not be less than 250 ft, and the ~~meteorological visibility~~ VIS not less than 800 m.

Explanatory note

Editorial change for alignment with NPA 2018-06(C).

20. GM9 CAT.OP.MPA.110 is amended as follows:

GM9 CAT.OP.MPA.110 Aerodrome operating minima — helicopters

~~If the indicated airspeed considered at instrument procedure design implies a descent rate higher than 700 ft/mn, the operator should consider an add-on depending on the descent rate when computing the DH from the OCH. It could be typically 50 ft/mn for helicopters with an MCTOM equal or less than 3 175 kg and 100 ft/mn for helicopters with an MCTOM above 3 175 kg.~~

High vertical speeds should be avoided due to unstable aerodynamics and potential transient autorotation state of the main rotor.

Vertical speeds at or below 800 ft/min should be considered to be normal, and vertical speeds above 1 000 ft/min should be considered to be high.

The vertical speed on final approach increases with the descent angle and the ground speed (GS), including tailwinds. Whereas the helicopter should be manoeuvred into the wind during the visual segment of an instrument approach, tailwinds may be encountered during the instrument segments of the approach.

If the vertical speed is above 1 000 ft/min, a go-around should be considered.

Table 9.5.H below gives an indication of the vertical speed based on the descent angles and ground speed.

Table 9.5.H: Examples of vertical speeds

Ground speed	**Descent angle**	**Vertical speed**
80 kt	5.7° (10 %)	800 ft/min
100 kt	5.7° (10 %)	1 000 ft/min
80 kt	7.5° (13.2 %)	1 050 ft/min
100 kt	7.5° (13.2 %)	1 300 ft/min

Note: A GS of 80 kt may be the result of an indicated airspeed (IAS) of 60 kt and a tailwind component of 20 kt.

Explanatory note to GM9 CAT.OP.MPA.110

This amendment is intended to achieve the specific objective described in Section 2.3.3: Implementation of the new definitions; Minor changes to reflect the operational capabilities of helicopters; Introduction of helicopter PinS approaches to reflect the recent evolution of ICAO Doc 8168 (PANS-OPS), and simplification.

Helicopter PinS approaches can be designed with steep descent angles, in accordance with ICAO Doc 8168 (PANS-OPS). Maximum descent angles are currently 7.5° on the final approach segment and up to 8.3° on the visual segments. The maximum descent angles tend to increase with time. The high descent angles, associated with potential tailwinds during the instrument segment of the approach, result in high vertical speeds.

Initially, the concern regarding steep approach angles was the height loss at the DH. This concern was inherited from aeroplanes using the CDFA technique that do have this problem when converting an MDH into a DH for the purpose of implementing the CDFA technique, because of high inertia. Helicopters, however, have much higher vertical acceleration capabilities and are likely not to implement the CDFA technique (see above).

The initial wording of the GM is therefore deleted and replaced by some information on helicopter-relevant issues when flying an approach with high vertical speeds.

21. The following AMC1 CAT.OP.MPA.125(c) is inserted:

AMC1 CAT.OP.MPA.125(c) Instrument departure and approach procedures

HELICOPTERS

(a) The operator may request the approval of an operator-designed approach procedure, or for heliports/operating sites located within 1 NM off the coastline, may request the approval of use of an airborne radar approach to a location on land (ARA-L).

ARA-L — HELICOPTERS

(b) An ARA-L should only be flown if the helicopter is equipped with the following:

(1) a weather radar or other piece of equipment that is capable of providing navigation and real-time obstacle environment information for obstacle clearance; and

(2) a moving map system that includes a clear and correct image of the coastal terrain. This system or navigation display should be able to depict the desired track inbound the ARA-L landing location and be used for increased situational awareness. The same system should include obstacle information data of the area close to the coastline. A helicopter terrain awareness system (HTAWS) or similar would fulfil this option.

(3) For single-pilot operations, a 4-axis autopilot, or if a 3-axis autopilot is used, an increment of 100 ft should be applied to the decision height (DH).

(4) GNSS equipment for tracking guidance.

(c) ARA-L design

(1) The minimum descent height (MDH) should not be lower than the greater of:

(i) 50 ft above the elevation of the landing location;

(ii) 50 ft above any obstacle between the coastline and the landing location;

(iv) 300 ft by day; or

(v) 400 ft by night.

(2) Minimum descent altitude (MDA) may only be used if the radio altimeter is unserviceable. The MDA should be a minimum of the MDH + 200 ft, and be based on a calibrated barometer at destination or on the lowest forecast barometric pressure adjusted to sea level (QNH) for the region.

(3) The decision range should be at least 1 NM from closest land at a ground speed of maximum 80 kt.

(4) The approach track should be chosen to enable the greatest awareness of terrain features and to reduce the tailwind component. For single-pilot operations, the coastline should appear on the pilot's side. The approach track should be 30 to 90 degrees to the coastline. The lateral clearance from any obstacle up to the MAPt should be at least 1 NM.

(5) The maximum tailwind component in the visual segment should be 10 kt.

(6) The MAPt should be defined as the distance from the selected GNSS waypoint or the distance to the closest radar target image of the same waypoint, whichever comes first.

(7) The missed approach procedure should include a turn away from land. A bank angle of no more than 20 degrees should be sufficient to ensure an obstacle separation compatible with the navigation performance of the GNSS, taking into account the maximum acceptable winds. The lateral clearance from any obstacle during the go-around phase should be compatible with the navigation performance.

(d) Operating procedure

(1) A procedure set-up should be done prior to the start of the procedure. This should include the selection of the destination in the FMS/NAV system. Track guidance towards this position should be selected on the navigation display. The airborne radar image should be available.

(2) Before commencing the final approach, the commander should ensure that a clear path exists on the radar screen for the final and missed approach segments. The lateral clearance defined in (c) should be maintained during the flight.

(3) During flight preparation, the forecast wind at destination should ensure a tailwind component compatible with (c)(5) on the visual segment starting at the MAPt.

(4) During flight preparation, rain should be considered as heavy rain may clutter the radar image and limit the ability to fly the ARA-L.

(5) If a destination alternate is selected, a non-radar-based approach should be available at the alternate.

(6) Before the approach, the pilot should assess the wind using available information and should initiate the approach only if the ground speed defined can be maintained within the defined limits.

(7) Display of track information could be either magnetic or true; however, the same track should be displayed on the GNSS display and radar image.

(8) Prior to continuing visually, the pilot should be in sight of the destination.

(e) Initial training and checking for ARA-L should be conducted either as part of the operator's conversion course or as a separate equipment and procedure training, and should include all of the following:

(1) ground training, including:

(i) knowledge of the structure of the ARA-L;

(ii) knowledge of the airborne radar specifications, limitations, modes, and usage;

(iii) knowledge of the area navigation system;

(2) aircraft/FSTD training to proficiency, including all of the following:

(i) ARA-L to the maximum crosswinds and to the maximum tailwinds envisaged in the operation;

(ii) ARA-L to the lowest minima, followed by a go-around and by a landing;

(iii) ARA-L in the pilot-monitoring, pilot-flying and single-pilot functions, as relevant to the kind of operations;

(3) line flying under supervision;

(4) a line check.

(f) The recurrent training and checking programme should include at least one ARA-L per year in the pilot-monitoring, pilot-flying and single-pilot functions as relevant to the operations. OSAP should be part of the annual aircraft/FSTD training, the line check or the operator proficiency check. If OSAPs are trained and not checked, then the flight crew member should be trained to proficiency to fly the OSAP.

(g) The aerodrome or operating site used for ARA-L operations should be considered to be a Category C aerodrome under ORO.FC.105.

22. The following GM1 CAT.OP.MPA.125(c) is inserted:

GM1 CAT.OP.MPA.125(c) Airborne radar approach to location on land (ARA-L)

GENERAL

(a) General

(1) The helicopter ARA-L procedure may have as many as five separate segments: the arrival, initial, intermediate, final approach, and missed approach segment. The individual approach segments can begin and end at designated fixes. However, the segments of an ARA-L may often begin at specified points where no fixes are available.

(2) The fixes, or points, are named to coincide with the beginning of the associated segment. For example, the intermediate segment begins at the intermediate fix (IF) and ends at the final approach fix (FAF). Where a fix is not available or not appropriate, the segments begin and end at specified points; for example, at the intermediate point (IP) and final approach point (FAP). The order in which the segments are discussed in this GM is the order in which the pilot would fly them in a complete procedure: that is, from the arrival through the initial and intermediate to the final approach and, if necessary, to the missed approach.

(3) Only those segments that are required by local conditions prevailing at the time of the approach need to be included in a procedure. In constructing the procedure, the final approach track, which should be orientated so as to be substantially into the wind, should be identified first as it is the least flexible and most critical of all the segments. When the origin and the orientation of the final approach have been determined, the other necessary segments should be integrated with it to produce an orderly manoeuvring pattern that does not generate an unacceptably high workload for the flight crew.

(4) The GNSS/area navigation system should be used to enhance the safety of the ARA-L. This is achieved by using the GNSS/area navigation system to navigate the helicopter onto, and maintain, the final approach track, and by using the GNSS range and bearing information to navigate to the position of the landing location on the weather radar display.

(5) Examples of ARA-L procedures, as well as vertical profile and missed approach procedures, are contained in Figures 1 and 2 below.

(b) Obstacle environment

(1) Each segment of the ARA is located in an overwater area that has a flat surface at sea level. However, due to the passage of large vessels which are not required to notify their presence, the exact obstacle environment cannot be determined. As the largest vessels and structures are known to reach elevations that exceed 500 ft above mean sea level (AMSL), the uncontrolled offshore obstacle environment at the arrival, initial and intermediate approach segments can reasonably be assumed to be capable of reaching to at least 500 ft AMSL. Nevertheless, in the case of the final approach and missed approach segments, specific areas are involved within which no radar returns are allowed. In these areas, the height of wave crests, and the possibility that small obstacles may be present that are not visible on the radar, result in an uncontrolled surface environment that extends to an elevation of 50 ft AMSL.

(2) Information about movable obstacles should be retrieved from a vessel traffic service (VTS)/automatic identification system AIS. VTS is a marine traffic monitoring system established by harbour or port authorities, similar to air traffic control for aircraft based on satellite. The automatic identification system (AIS) is an automatic tracking system that uses transponders on ships and is used by vessel traffic services (VTS).

Under normal circumstances, the relationship between the approach procedure and the obstacle environment is governed by the concept that vertical separation is very easy to apply during the arrival, initial and intermediate segments, while horizontal separation, which is much more difficult to guarantee in an uncontrolled environment, is applied only in the final and missed approach segments.

(c) Arrival segment

The arrival segment commences at the last en-route navigation fix, where the aircraft leaves the helicopter route, and it ends either at the initial approach fix (IAF) or, if no course reversal or similar manoeuvre is required, it ends at the IF. Standard 1 000-ft en-route obstacle clearance criteria should be applied to the arrival segment.

(d) Initial approach segment

The initial approach segment is only required if the intermediate approach track cannot be joined directly. Most approaches will be flown direct to a point close to the IF, and then on to the final approach track, using GNSS/area navigation guidance. The segment commences at the IAF, and on completion of the manoeuvre, it ends at the IP. The minimum obstacle clearance (MOC) assigned to the initial approach segment is 1 000 ft.

(e) Intermediate approach segment

The intermediate approach segment commences at the IP, or in the case of straight-in approaches, where there is no initial approach segment, it commences at the IF. The segment ends at the FAP and should not be less than 2 NM in length. The purpose of the intermediate segment is to align the helicopter with the final approach track and prepare it for the final approach. During the intermediate segment, the helicopter should be lined up with the final approach track, the speed should be stabilised, the destination should be identified on the radar, and the final approach and missed approach areas should be identified and verified to be clear of radar returns. The MOC assigned to the intermediate segment is 500 ft.

(f) Final approach segment

(1) Final approach track should be selected with an angle of less than 90° to reduce the closure rate to land. For single-pilot operations, the land should be oriented to the same side as the commander's seat.

(2) The final approach segment commences at the FAP and ends at the missed approach point (MAPt). The FAP is located 4 NM from the landing location. The final approach area, which should be identified on the radar, takes the form of a corridor between the FAP and the radar return of the destination. This corridor should not be less than 2-NM wide so that the projected track of the helicopter does not pass closer than 1 NM to the obstacles lying outside the area.

(2) On passing the FAP, the helicopter will descend below the intermediate approach altitude and follow a descent gradient which should not be steeper than 6.5 %. At this stage, vertical separation from the offshore obstacle environment will be lost. Descent from 1 000 to 250 ft AMSL at a constant 6.5-% gradient will involve a horizontal distance of 2 NM.

(3) During the final approach, tracking should be maintained by coupling to the GNSS final approach track, and the compensation for drift is then automatically taken care of. The approach ends at the 1-NM distance to the selected landing location and is identified by either the GNSS distance or the radar image distance, whichever comes first.

(g) Missed approach segment

(1) The missed approach segment commences at the MAPt 1 NM from the landing location and ends when the helicopter reaches the minimum en-route altitude. The missed approach manoeuvre is a 'turning missed approach'.

(2) At MAPt 1NM before waypoint, a turn away out on the reciprocal inbound course will be initiated. Final approach track will be selected at an offset angle, preferably allowing for missed approach away from land on the 'sea side' and into the wind. This geometry will also mean that very early into the turn, distance to land will build up. (In addition, the generous climb gradient — even with engine out — will allow for considerable height gain during turn.)

(i) Radar equipment

During the ARA procedure, colour-mapping radar equipment with a 120° sector scan and a 2.5-NM range scale selected may result in dynamic errors of the following order:

(1) bearing/tracking error of ± 4.5° with 95 % accuracy;

(2) mean ranging error of 250 m; or

(3) random ranging error of ± 250 m with 95 % accuracy.

Figure 1: Horizontal profile with a final approach track of 360°

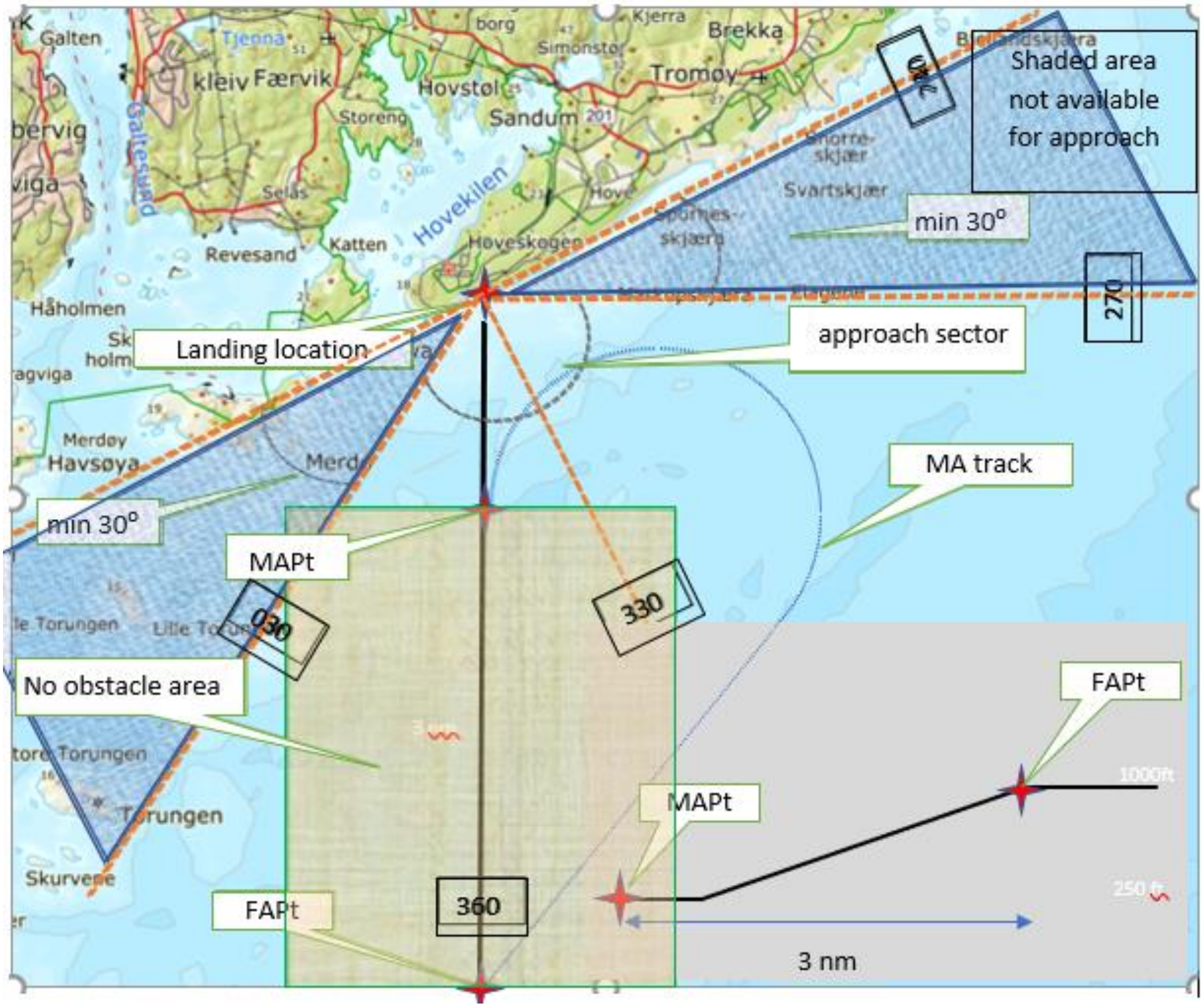


Figure 2: Vertical profile

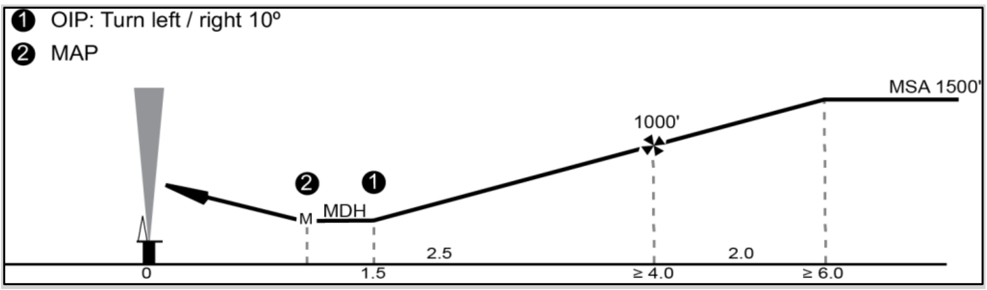


Figure 3: Available approach paths — based on examples in Figures 1 and 2

Single-pilot OPS (pilot on right-hand seat)	**270° to 330°**
Multi-pilot OPS	**270° to 010°** **[010 to 030° not available due to obstacle: Thorungen Island within less than 1 NM]**

Figure 4: Maximum wind to comply with tailwind limitations — based on examples in Figures 1 and 2 in single-pilot operations — Flight preparation purposes

Origin of wind	**200°**	**180°**	**160°**	**120°**	**090°**	**060°**
Relative wind direction	**Left 070**	**Left 090**	**Left 110**	**Right 150**	**Right 120**	**Right 090**
Max strength	**n/a**	**n/a**	**30 kt**	**12 kt**	**20 kt**	**n/a**
Approach strategy	**270**	**270**	**270**	**330**	**330**	**330**

Note: The operator may also use Table 4 to define the maximum wind strength to comply with any crosswind limitations.

Explanatory note to AMC1 and GM1 CAT.OP.MPA.125(c)

This amendment is intended to achieve the specific objective described under Section 2.3.1: Enable onshore IFR operations by providing additional options: Use of the airborne radar to fly an instrument approach to the coastline.

The airborne radar approach (ARA) has been designed to fly to an artificial rig or vessel at sea, with no obstacles around. ARA can be adapted to an approach to the coastline with several adjustments, and then becomes an airborne radar approach to the location on land (ARA-L).

ARA-L is not the only option to obtain an approval to fly an approach that is not published by the State under CAT.OP.MPA.125(c), but it is one that is worthwhile developing an AMC for.

Tailwinds: When comparing ARA with ARA-L, the main difference is that ARA is flown towards the land. The land needs to be in front of the helicopter so that it can be identified on the radar, and be on the pilot's side for sufficient situational awareness. The resulting situation is that the pilot cannot avoid some tailwind in certain weather conditions.

As the approach is conducted towards the land, it is considered unsafe to fly an ARA-L with a tailwind component of more than 10 kt and with a ground speed of more than 80 kt.

The weather forecasts should be checked to ensure that these wind and speed limitations can be complied with during the flight preparation.

Prior to commencing the approach, at least the ground speed conditions should be checked.

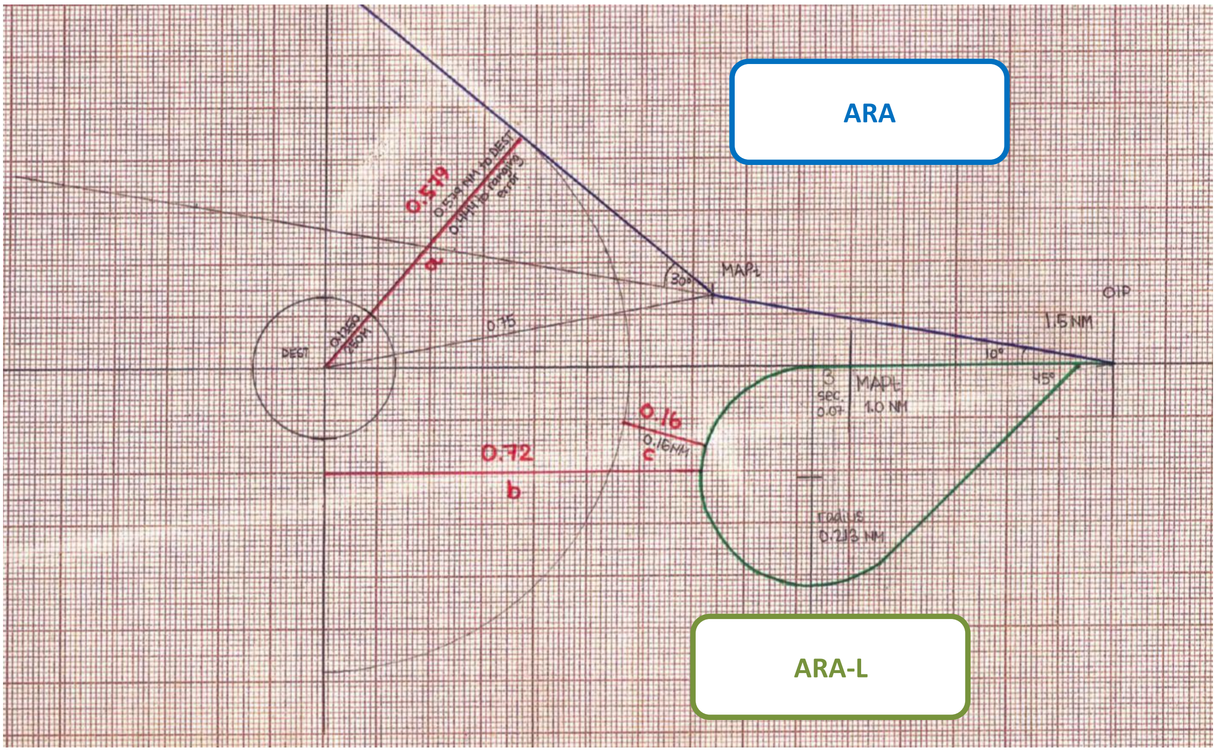
Crosswinds: The pilot may not be able to avoid crosswinds during the final approach and during the first part of the visual segment, for the same reason. Flying an ARA-L in strong crosswinds may result in unusual drift angles, which requires training. The operator may define a maximum crosswind component.

Missed approach: The missed approach of ARA-L is also very different. At the MAPt, the missed approach flight path of ARA-L heads towards the land. The missed approach flight path should be designed to ensure obstacle protection. Figure 1 compares the missed approach paths of ARA and ARA-L.

Once the approach track has been defined, based on the operational conditions, the position of the coastline and any islands is likely to determine whether the go-around is a left-hand or a right-hand turn.

Prior to commencing the approach, the radar should be checked to ensure that no unknown vessels or obstacles are in the way of the go-around, otherwise the approach should not be conducted.

Figure 1: Missed approach calculation — ARA and ARA-L compared



On the illustration above, both ARA and ARA-L are presented. ARA will provide a 0.579-NM (line a) clearance at its closest; if the ranging error of ± 250 NM/0.1350 NM is subtracted, the clearance is 0.444 NM. (The ranging error has been drawn around destination point for simplicity.) On the other hand, ARA-L will provide approximately a 0.720-NM (line b) clearance to 'land' (or approx. 0.585 NM considering the ranging error).

An arc around the destination has been drawn to illustrate the ARA clearance. It can be seen that the ARA-L missed approach nominal track can be displaced by 0.16 NM (line c) by wind before an infringement will occur. As it has been explained, sustained adverse winds during missed approach are highly unlikely due to the selection of final approach track.

In addition, the helicopter will achieve considerable altitude during the missed approach turn, while a helicopter conducting an ARA will maintain MDA to the 0.75 Decision Range.

Assumptions and calculations

For the proposed ARA-L, a 3-second bank establishment time and a 10-kt tailwind delay are considered before turn initiation is assumed. Speed should be maximum 70 KIAS during missed approach turn, and bank angle will be maximum 20°.

The 3-second delay is calculated as follows:

70 KIAS. 1 000 ft. Density error: 1.0411 > 72.877 KTAS. !0 KT TW > 82.877 kt GS.

Distance travelled in 3 seconds: 82.877/3 600 × 3 = 0.0690642 NM (127.91 m)

Rate of turn:

Rate = (3431 × tan20)/(Π × 72.877) = 5.4544°/second

Radius of turn:

R = 72.877/(20 × Π × 5.4544) = 0.212649 NM (393.83 m)

The missed approach area to be used should be identified and verified as a clear area on the radar screen during the intermediate approach segment. The base of the missed approach area is a sloping surface at 2.5-% gradient starting from MDH at the MAPt. The concept is that a helicopter that executes a turning missed approach will be protected by the horizontal boundaries of the missed approach area until vertical separation of more than 130 ft is achieved between the base of the area and the offshore obstacle environment of 500 ft AMSL that prevails outside the area.

The above assumptions already take into account the maximum tailwind components. If relevant to the shape of the coastline or due to islands or obstacles at sea, the above calculations may need to be modified to take into account any crosswind component. The operator may define a maximum crosswind component to ensure obstacle clearance.

23. AMC1 CAT.OP.MPA.192(d) is amended as follows:

AMC1 CAT.OP.MPA.192(d) ~~182 Destination aerodromes — instrument approach operations~~ Selection of aerodromes and operating sites — helicopters

PBN OPERATIONS

(a) In case it was not demonstrated that the GNSS provides sufficient reliability and integrity, ~~T~~the ~~pilot-in-command~~commander should only select an aerodrome as a destination alternate aerodrome if an instrument approach procedure that does not rely on GNSS is available either at that aerodrome or at the destination aerodrome.

GNSS RELIABILITY AND INTEGRITY

(b) The operator may demonstrate sufficient reliability and integrity of the GNSS if all of the following criteria are met:

(1) SBAS or GBAS are available and used.

(2) The failure of a single receiver or system should not compromise the navigation capability.

(3) The temporary jamming of one frequency should not compromise the navigation capability. The operator should establish a procedure to deal with such cases unless other sensors are available.

(4) The operator should ensure that no space weather event is predicted to disrupt the GNSS reliability and integrity at both the destination and the alternate.

(5) The operator should verify the availability of RAIM for all phases of flight based on GNSS, including navigation to the alternate.

(6) The operator's MEL should reflect the elements in paragraphs (b)(1) and (b)(2).

24. The following GM2 CAT.OP.MPA.192(d) is inserted:

GM2 to AMC1 CAT.OP.MPA.192(d) Selection of aerodromes and operating sites — helicopters

GNSS RELIABILITY AND INTEGRITY

(a) Redundancy of on-board systems should ensure that no single on-board equipment failure (e.g. antenna, GNSS receiver, FMS, or navigation display failure) results in the loss of the GNSS capability.

(b) Any shadowing of the GNSS signal or jamming of the GNSS frequency from the ground is expected to be of a very short duration and affect a very small area. Additional sensors or functions, such as inertial coasting, may be used during jamming events.

(c) The availability of GNSS signals can be compromised if space weather events cause 'loss of lock' conditions and more than one satellite signal may be lost on a given GNSS frequency. Until space weather forecasts are available, the operator may use 'nowcasts' as short-term predictions for helicopter flights of short durations.

(d) SBAS also contributes to mitigate space weather effects, both by providing integrity messages and by correcting ionosphere-induced errors.

(e) Even though SBAS should be available and used, RAIM should remain available autonomously. In case of loss of SBAS, the route and the approach to the destination or alternate should still be flown with an available RAIM function.

(f) When available, GNSS based on more than one constellation and more than one frequency may provide better integrity and redundancy regarding failures in the space segment of GNSS, jamming, and resilience to space weather events.

Explanatory note to AMC1 and GM1 CAT.OP.MPA.192(d)

This NPA proposes this new AMC and GM to achieve the specific objective described in Section 2.3.1: Enable onshore IFR operations by providing additional options: Increase the number of available and accessible alternates within the available fuel range.

Helicopter onshore IFR operations are expected to be mainly supported by GNSS-based PinS approaches to a non-aerodrome destination. The current AMC requires an alternate with a conventional navigation aid, which can be a limiting factor when considering the fuel range of a helicopter, which is very low compared to that of an aeroplane. An alternate may or may not be available.

The current AMC leads helicopter operators to fly VFR in marginal conditions and take unnecessary risks.

Helicopter LLRs are PinS approaches which are currently based on RNP 0.3 and are below the minimum altitude required to receive conventional navigation aids. Very few helicopters are certified for icing conditions. The go-around on a helicopter PinS approach may be based solely on GNSS. As a result, in case of a loss of GNSS navigation in the en-route phase or during the approach, the helicopter might collide with terrain or encounter icing conditions against which it is not protected, before it can receive conventional navigation aids and be guided to the IAF of a conventional approach.

For these reasons, the current AMC sets lower standards for helicopters than it does for aeroplanes.

This NPA proposes to amend the AMC, in order to achieve both of the following goals:

— to provide options for helicopters to rely solely on GNSS for the approach at destination and at the alternate, and increase the proportion of helicopter flights that can be planned under IFR; and

— to increase the reliability and integrity standards of GNSS for helicopters, with obvious safety benefits in the en-route phase and in the case of a go-around.

This NPA proposes that the increased reliability and integrity of GNSS should be the condition to obtain the desired operational credit under IFR.

The proposed integrity and reliability criteria are considered to be sufficient, considering that the risk of losing the satellite segment of the GPS navigation is negligible compared to losing GNSS navigation due to the failure of an on-board system, and because the safety target set for helicopters is lower than for aeroplanes, as discussed above. The proposal will increase safety by offering incentives to fly IFR rather than marginal VFR.

Space weather predictions should be considered if a solar event is predicted to have sufficient strength to result in a loss of lock of one or more of the satellites of the GNSS or SBAS components. Not all such space weather events are predictable, but most should have limited duration. Space weather events that only reduce the navigation precision should be mitigated by the use of GBAS or SBAS.

Finally, multi-constellation multi-frequency GNSS will provide full redundancy within the space segment of the GNSS navigation system in the near future, as well as many other advantages. This technology will render obsolete the need for a conventional navigation backup and should be incentivised, even if conventional navigation should remain in use when available.

The ICAO PBN manual is expected to be amended and new industry standards are expected to be developed to offer new capabilities to aircraft operators.

Future avionics systems are expected to take advantage of these new capabilities and to ensure the reliability and integrity of GNSS without relying on conventional navigation aids.

Helicopter operators that wish to rely only on GNSS for the approach at destination and at the alternate should upgrade to such navigation systems when available.

As it is impossible to mention future standards or to refer to unavailable systems in the AMC material, this incentive is only reflected in paragraph (e) of the GM. The AMC should be revised in the future to ensure that multi-constellation multi-frequency GNSS is implemented when available, whenever operators rely on GNSS for the approach to both the destination and to the alternate.

The use of SBAS and the redundancy of on-board systems are expected to remain necessary to ensure that no single on-board equipment failure (e.g. antenna, GNSS receiver, FMS, or navigation display failure) can compromise safety.

25. AMC1 CAT.OP.MPA.305(e) is renumbered and amended as follows:

AMC1 CAT.OP.MPA.305(b~~e~~) Commencement and continuation of approach

VISUAL REFERENCES FOR INSTRUMENT APPROACH OPERATIONS

~~(a) NPA, APV and CAT I operations~~

~~At DH or MDH, at least one of the visual references specified below should be distinctly visible and identifiable to the pilot:~~

For instrument approach operations Type A, and CAT I instrument approach operations Type B, at least one of the visual references specified below should be distinctly visible and identifiable to the pilot at the MDA/H or the DA/H:

(a~~1~~) elements of the approach lighting system;

(b~~2~~) the threshold;

(c~~3~~) the threshold markings;

(d~~4~~) the threshold lights;

(e~~5~~) the threshold identification lights;

(f~~6~~) the visual glide slope indicator;

(g~~7~~) the TDZ ~~touchdown zone~~ or TDZ ~~touchdown zone~~ markings;

(h~~8~~) the TDZ ~~touchdown zone~~ lights;

(i~~9~~) FATO/runway edge lights; ~~or~~

(j) for helicopter point-in-space approaches, the identification beacon light;

(k) for helicopter point-in-space approaches, the identifiable elements of the environment defined on the instrument chart;

(l) for helicopter point-in-space approaches with instructions to 'proceed VFR', sufficient visual cues to determine that VMC are met; or

(m~~10~~) other visual references specified in the operations manual.

~~(b) LTS CAT I operations~~

~~At DH, the visual references specified below should be distinctly visible and identifiable to the pilot:~~

~~(1) a segment of at least three consecutive lights, being the centreline of the approach lights, or touchdown zone lights, or runway centreline lights, or runway edge lights, or a combination of them;~~

~~(2) this visual reference should include a lateral element of the ground pattern, such as an approach light crossbar or the landing threshold or a barrette of the touchdown zone light unless the operation is conducted utilising an approved HUDLS usable to at least 150 ft.~~

~~(c) CAT II or OTS CAT II operations~~

~~At DH, the visual references specified below should be distinctly visible and identifiable to the pilot:~~

~~(1) a segment of at least three consecutive lights being the centreline of the approach lights, or touchdown zone lights, or runway centreline lights, or runway edge lights, or a combination of them;~~

~~(2) this visual reference should include a lateral element of the ground pattern, such as an approach light crossbar or the landing threshold or a barrette of the touchdown zone light unless the operation is conducted utilising an approved HUDLS to touchdown.~~

~~(d) CAT III operations~~

~~(1) For CAT IIIA operations and for CAT IIIB operations conducted either with fail-passive flight control systems or with the use of an approved HUDLS: at DH, a segment of at least three consecutive lights being the centreline of the approach lights, or touchdown zone lights, or runway centreline lights, or runway edge lights, or a combination of these is attained and can be maintained by the pilot.~~

~~(2) For CAT IIIB operations conducted either with fail-operational flight control systems or with a fail-operational hybrid landing system using a DH: at DH, at least one centreline light is attained and can be maintained by the pilot.~~

~~(3) For CAT IIIB operations with no DH, there is no specification for visual reference with the runway prior to touchdown.~~

~~(e) Approach operations utilising EVS — CAT I operations~~

~~(1) At DH, the following visual references should be displayed and identifiable to the pilot on the EVS image:~~

~~(i) elements of the approach light; or~~

~~(ii) the runway threshold, identified by at least one of the following:~~

~~(A) the beginning of the runway landing surface,~~

~~(B) the threshold lights, the threshold identification lights; or~~

~~(C) the touchdown zone, identified by at least one of the following: the runway touchdown zone landing surface, the touchdown zone lights, the touchdown zone markings or the runway lights.~~

~~(2) At 100 ft above runway threshold elevation, at least one of the visual references specified below should be distinctly visible and identifiable to the pilot without reliance on the EVS:~~

~~(i) the lights or markings of the threshold; or~~

~~(ii) the lights or markings of the touchdown zone.~~

~~(f) Approach operations utilising EVS — APV and NPA operations flown with the CDFA technique~~

~~(1) At DH/MDH, visual references should be displayed and identifiable to the pilot on the EVS image as specified under (a).~~

~~(2) At 200 ft above runway threshold elevation, at least one of the visual references specified under (a) should be distinctly visible and identifiable to the pilot without reliance on the EVS.~~

Explanatory note to AMC1 CAT.OP.MPA.305(b)

This amendment is intended to achieve the specific objective described in Section 2.3.3: Implementation of the new definitions; Minor changes to reflect the operational capabilities of helicopters; Introduction of helicopter point-in-space (PinS) approaches to reflect the recent evolution of ICAO Doc 8168 (PANS-OPS), and simplification.

The visual references for helicopter PinS approaches are amended to reflect the design of these procedures.

Helicopter PinS approaches with instructions to 'proceed VFR' are cloud-breaking procedures that may be used to continue flight under VFR to an unspecified destination. By design, a visual reference to thresholds or approach lights may never be available at the missed approach point (MAPt), even in good weather. As the flight should only continue under VFR, the pilot should first ensure that VMCs are met.

NPA 2018-06(C) already proposed the deletion of paragraph (b) onwards.

Note: CAT.OP.MPA.305 and related AMCs are further amended by NPA 2018-06(C).

Section 2.3.1 of this NPA provides quick access to the amendments that are the most relevant to helicopters.

ANNEX V

SPECIFIC APPROVALS

[PART-SPA]

SUBPART E
LOW VISIBILITY OPERATIONS (LVO)

26. The following AMC3 SPA.LVO.100(a) is inserted:

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

LOW-VISIBILITY TAKE-OFF (LVTO) OPERATIONS — HELICOPTERS

The following should apply to LVTO for helicopters with an RVR of less than 400 m:

(a) For take-off from onshore aerodromes or operating sites with IFR departure procedures, the criteria in Table 1.H should apply:

Table 1.H: LVTO operations with helicopters — RVR v facilities onshore

RVR or VIS (m) *	**Facilities**
Not less than 250 m or the rejected take-off distance, whichever is the greater	No light and no markings (day only)
Not less than 800 m	No markings (night)
Not less than 200 m	Runway edge/FATO light and centre line marking
Not less than 150 m	Runway edge/FATO light, centre line marking and relevant RVR information

* On PinS departures to IDF, RVR should be not less than 800 m.

(b) For take-off from offshore helidecks where the take-off flight path is free of obstacles, the minimum RVR for take-off should not be less than:

— 500 m for single-pilot operations; or

— 250 m for two-pilot operations.

Explanatory note to AMC3 SPA.LVO.100(a)

The AMC is renumbered.

A note is added to ensure that the take-off minima for helicopter PinS departures remain 800 m, because the current ICAO Doc 8168 (PANS-OPS) requires that helicopters:

— remain visual until the initial departure fix (IDF);

— be capable of manoeuvring and returning to the take-off point at any time during the visual segment of the flight.

It is considered relevant to maintain a reference to VIS in this case.

Note: ICAO Doc 8168 (PANS-OPS) is currently proposed to be amended to allow pilots to enter a cloud layer before the initial departure fix (IDF) under certain conditions. The transition would take place no lower than the minimum crossing altitude. In anticipation of these amendments, Doc 8168 still does not permit take-off minima below 800 m, even under a specific approval.

27. AMC1 SPA.LVO.100(b) is amended as follows:

AMC1 SPA.LVO.100(b) Low-visibility operations and operations with operational credits

CAT II OPERATIONS

The following provisions should apply to CAT II operations:

(a) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance and be not lower than the highest of:

(1) the minimum DH for CAT II specified in the AFM, if stated;

(2) the applicable obstacle clearance height (OCH) for the category of ~~aeroplane~~ aircraft;

(3) the DH to which the flight crew is qualified to operate; or

(4) 100 ft.

(b) The lowest RVR minima to be used are specified in Table 3:

Table 3: CAT II operations

operation minima: RVR (m) v~~s~~ DH (ft) **~~Aeroplane~~ Aircraft categories** **DH (ft)**	**A, B, C**	**D**
100–120	300	300/350*
121–140	400	400
141–199	450	450

*~~:~~ An RVR of 300 m may be used for a Category D aeroplane conducting an autoland.

Explanatory note to AMC1 SPA.LVO.100(b)

This AMC is based on the AMC published in NPA 2018-06(C) and is extended to helicopter operations because helicopters may be certified for CAT II operations in the near future. The wording 'aircraft category' is also aligned with CAT.OP.MPA.320.

28. The following AMC4 SPA.LVO.100(c) is inserted:

AMC4 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

HELICOPTER SPECIFIC APPROVAL CATEGORY I (HELI SA CAT I) OPERATIONS

(a) For HELI SA CAT I operations, the following should apply:

(1) HELI SA CAT I operations should apply only to a runway with an approach lighting system. The following visual aids should be available:

(i) standard runway day markings, approach lights, runway edge lights, threshold lights, and runway end lights;

(ii) for operations with an RVR below 450 m, additionally touch-down zone and/or runway centre line lights.

(2) An instrument landing system/microwave landing system (ILS/MLS) that supports a HELI SA CAT I operation should be an unrestricted facility.

(3) The helicopter should meet the following specifications:

(i) The helicopter should be equipped with a 4-axis autopilot capable of flying the approach to the minima and automatic level-off capability.

(ii) The helicopter should be able to maintain Vy in IMC on a coupled Type B approach.

(iii) The helicopter should be equipped with a radio altimeter or other device capable of providing equivalent performance.

(iv) The helicopter should be equipped with two independent navigation aids capable of Type B CAT I approaches and certified for CAT I.

(4) The decision height (DH) of a HELI SA CAT I operation should not be lower than the highest of:

(i) the minimum DH specified in the AFM, if stated;

(ii) the minimum height to which the precision approach aid can be used without the specified visual reference;

(iii) the applicable obstacle clearance height (OCH) for Category A aeroplanes or the obstacle clearance height (OCH) for Category H if available;

(iv) the DH to which the flight crew is qualified to operate;

(v) 130 ft on a CAT II landing system;

(vi) 150 ft on a CAT I ILS certified to Class I/C/1 or MLS certified to 100 ft/E/1; or

(vii) 200 ft on other landing systems.

(5) The lowest RVR/converted meteorological visibility (CMV) minima to be used are specified in Table 2 below.

Table 2: HELI SA CAT I operation minima

	RVR/CMV v approach lighting system
DH (ft)	**Class of light facility**

	FALS	**IALS**	**BALS**	**NALS**
201–250	450	650	750	1 000
181–200	300	450	650	900
151–180	300	350	550	750
130–150	300	300	400	600

(6) Operations

(i) The minimum crew should be two pilots or one pilot and a technical crew member. The technical crew member should be seated in the front seat and be allocated no other task than assisting the pilot, from the initial approach fix (IAF) onwards.

(ii) On a CAT II landing system, the flight crew should use the radio altimeter or other equivalent device for the determination of the DH.

(iii) On a CAT I ILS, the flight crew should use the altimeter for the determination of the DH. The crew should cross-check the altitude with the radio altimeter or equivalent device, considering the local geography.

(iv) The AFCS and radio altimeter should be serviceable prior to commencing the approach.

(v) The approach should be flown in coupled 4-axis mode down to minima or below.

(vi) The flight crew should promptly initiate a go-around if any of the following conditions are met below 1 000-ft height:

(A) discrepancy in altitude/radio altitude information;

(B) discrepancy in navigation information;

(C) partial or total failure of an AFCS system or navigation system;

(D) deviation of ¼ scale or more on the landing system navigation display.

(vii) The planning minima at the alternate where a HELI SA CAT I approach is envisaged should be as defined in Table 3.

Table 3: Planning minima at the alternate with HELI SA CAT I operations

Type of approach	**Aerodrome ceiling**	**Weather minima RVR/VIS**
Two or more usable Type B instrument approach operations***	DA/H* + 100 ft	RVR** + 300 m
One usable Type B instrument approach operation	DA/H + 150 ft	RVR + 450 m

* The higher of the usable DA/H or MDA/H.

** The higher of the usable RVR or VIS.

*** Compliance with CAT.OP.MPA.192(d) should be ensured.

(vi) Under commercial air transport, if no other alternate is selected and the weather forecast at destination is not based on Part-MET, the planning minima at the alternate where a HELI SA CAT I approach is envisaged should be as defined in Table 4.

Table 4: Planning minima at the alternate with HELI SA CAT I operations with alternative weather source at destination

Type of approach	Aerodrome ceiling	Weather minima RVR/VIS
Two or more usable Type B instrument approach operations ***	DA/H * + 200 ft	RVR** + 600 m
One usable Type B instrument approach operation	DA/H + 300 ft	RVR + 900 m

* The higher of the usable DA/H or MDA/H.

** The higher of the usable RVR or VIS.

*** Compliance with CAT.OP.MPA.192(d) should be ensured.

(7) Crew training and competency

(i) Under CAT, NCC and SPO, the aerodrome used for HELI SA CAT I operations should be considered as a Category C aerodrome under ORO.FC.105.

(ii) A crew member should undergo training to determine the eligibility of a HELI SA CAT I approach under paragraphs (1) to (3), and the applicable minima under paragraphs (4) and (5).

(iii) A crew member should have the relevant knowledge to implement the operating procedures described under paragraph (6).

(iv) A crew member that is involved in HELI SA CAT I operations should undergo initial and recurrent training to proficiency using a suitable FSTD, including one approach and landing and one go-around using the lowest minima defined in paragraphs (4) and (5).

(v) The recurrent training should have a validity of 6 calendar months. The validity period shall be counted from the end of the month when the check was taken. When the operator proficiency check is undertaken within the last 3 months of the validity period, the new validity period shall be counted from the previous expiry date.

(vi) In addition to (v), a technical crew member that is involved in HELI SA CAT I operations should be trained to perform navigation and monitoring functions under IFR, as described under AMC2 SPA.HEMS.130(f)(1). If the technical crew member is not a HEMS crew member, HEMS-specific training elements may be omitted. The training should include all of the following on the given helicopter type:

(A) initial and recurrent general training;

(B) initial and recurrent monitoring training;

(C) initial and recurrent navigation training;

(D) initial and recurrent aircraft/FSTD training focusing on crew cooperation with the pilot;

(E) line flying under supervision;

(F) line check;

(G) operator proficiency check.

Explanatory note to AMC4 SPA.LVO.100(c)

This NPA proposes this new AMC to achieve the specific objective described in Section 2.3.1: Enable onshore IFR operations by providing additional options: Increase the number of available and accessible alternates within the available fuel range.

(a) Decision height (DH) on a CAT II landing system

A modern helicopter should be able to fly lower than 200 ft if a CAT II landing system to a runway is available. Partial capability is ensured even without CAT II certification of the helicopter.

— CAT-II-certified helicopters would provide two independent navigation aids, radio altimeter support, and a compare function.

— The requirement for two independent navigation aids and a radio altimeter is proposed to be maintained at operational level.

— The lack of a compare function can be mitigated by low speed, a multi-crew environment, and some altitude margin.

— The automatic level-off function and the available runway distance provide an additional layer of safety.

— The slow airspeeds available to modern helicopters in IFR and the available runway distance ensure that no excessive pitch-up manoeuvre is required to decelerate the helicopter and land within the runway distance.

— The OCH provides obstacle protection, including provisions for any descent below the DH on initiation of the go-around.

— Considering that aeroplanes fly significantly below the DH when going around at the DH, whereas helicopters flying descent angles designed for aeroplanes at slower speeds barely do, some altitude margins remain available.

The minimum DH could be as low as 100 ft on a CAT II landing system to a runway.

However, if a 100-ft DH was available for non-CAT-II-certified helicopters, no incentive would remain to equip and certify helicopters to the full CAT II privilege. Also, it is wise to maintain some margins. This NPA proposes a minimum DH of 130 ft.

(b) Decision height (DH) on a CAT I ILS

The modern helicopter described above should also be able to fly lower than 200 ft if a CAT I ILS to a runway is available.

— A CAT I ILS is certified and calibrated down to 100 ft.

— Category I/E/1 certification of an ILS ensures that ICAO Annex 10 navigation performance is ensured down to 100 ft.

— The glideslope signal is not reliable close to the ground, and autoland systems typically rely on the radio altimeter for the final 50 to 80 ft. However, this is not a problem at or above 100 ft.

— On a CAT I landing system, the OCH is usually lower than 200 ft and provides obstacle protection with some remaining margins. See CAT II landing systems above.

— A CAT I ILS localiser signal may be altered by aircraft, ground vehicles or objects that stand in the vicinity of any CAT I holding point. The protection of a CAT II holding point is lacking.

However, the calibration of the ILS does take place down to 100 ft in real-life conditions. Additionally, the following mitigations exist:

- Aeroplanes with Category D final approach speeds may use ILS CAT I signals down to 140 ft when going around at DH. No major alteration of the ILS signal should take place at 140 ft or higher.
- Minor deviations to the flight path due to an altered signal should not result in an unsafe reduction of obstacle margins above 140 ft. Additionally, with slower speed and greater manoeuvrability, helicopters should be able to fly the visual segment successfully and land on the runway from a slightly offset position.
- Following any strong alteration of the signal, the autopilot will attempt to follow the erroneous signal. This may result in a deviation visible on the landing system display and result in a go-around, or it may result in sufficient flight control input for the pilot to notice. This should also result in a go-around.

- In the go-around phase, helicopters have climb gradients that are much greater than aeroplanes. Any helicopter will catch up with the go-around obstacle protection surfaces designed for aeroplanes before the runway end.
- The radio altimeter should only be used to cross-check the baro-altitude at a given operator-defined location on the ILS, based on knowledge of the local geography, in order to avoid QNH errors. The radio altimeter cannot be used for height reference because the land located ahead of the runway on a CAT I ILS is not flat.
- Flying below 200 ft on a CAT I ILS requires closer monitoring by a well-coordinated crew. This NPA proposes a multi-crew of two pilots, or one pilot and one well-trained technical crew member, as for a CAT II landing system.

Considering the above, the lowest DH on a CAT I ILS could be 150 ft. [*optional:* The lowest DH could be lowered to 130 ft with a statement from the air navigation service provider in charge of the ILS signal, but such a DH is accessible only on a CAT II landing system to provide additional margins.]

(c) Decision heights (DHs) and performance aspects: In a runway environment, a clear area landing procedure can be used under performance class 1 and 2, or under Category A for non-CAT operations. The landing decision point (LDP) or decision point before landing (DPBL) is expected to be always compatible with the DHs defined in this AMC. It is reminded that Category A procedures for continued landing after the decision point were never flight tested under IMC. The operator should always select an LDP or DPBL within the visual segment of the instrument approach.

(d) Minimum RVR

A pilot has a much better angle of vision below when flying a helicopter than when flying an aeroplane. Given a full approach light system and a sufficiently low DH, the minimum horizontal visibility required to see a sufficient length of the approach lighting system is significantly reduced.

Under CAT II, the minimum RVR available to helicopters should not be below 300 m.

The minimum RVR should also be compatible with the distance from the decision point to the nearest approach lights/threshold lights, with a margin.

This is taken into account in a new ‘DH v RVR’ table.

(e) Planning minima

The planning minima are based on aeroplane ‘basic fuel scheme with variations’, as foreseen by RMT.0573 ‘Fuel planning and management’. The table refers to CAT.OP.MPA.192(d) which is proposed to be published in the RMT.0573-related Opinion on ‘Fuel planning and management’. The relevant extracts of this Opinion, including CAT.OP.MPA.192, are provided in Section 2.3.1 of this NPA for easy access. The same rationale as for the related Opinion applies:

In the event of an approach to a destination alternate aerodrome, a single failure on-board the aircraft or a single failure of the approach facilities should not put the landing at this aerodrome at risk.

An operator that has decided to perform a HELI SA CAT I approach operation at a destination alternate aerodrome where two or more usable Type B operations are available, should also be able to perform the other Type B CAT I approach (DH > 200 ft and RVR > 500 m) on the same alternate aerodrome. In the event of only one usable Type B operation at destination alternate aerodrome, the operator should be able to perform a Type A approach (DH > 250 ft and RVR > 600 m) at the destination alternate aerodrome.

The table below shows that the required add-ons at planning stage ensure the ability to perform the immediately higher category precision approach:

Available approaches	**Minima HELI SA CAT I**	**HELI SA CAT I planning minima (minima + add-ons)**	**Targeted category**	**Targeted category minima**	**Planning minima > Targeted category minima**
2 Type Bs	DH > 130, RVR > 300	DH > 230, RVR > 600	Type B CAT I	DH > 200, RVR > 500	Ok
1 Type B	DH > 130, RVR > 300	DH > 280, RVR > 750	Type A	DH > 250, RVR > 600	Ok

RVR in meters (m)
DH in feet (ft)

Under CAT, RMT.0573 on 'Fuel planning and management' has defined cases where no Part-MET-certified weather information is available at destination, yet only one destination alternate is required. In this case, the FUEL rulemaking task foresees that the planning minima increment at the alternate should be doubled (+ 400 ft/+ 800 m RVR instead of + 200 ft/+ 400 m). This NPA proposes to also double the planning minima increment at the alternate in that case, if a HELI SA CAT I approach operation is foreseen.

(f) Training

The proposed reduced minima can only be implemented if the crews are trained accordingly. The training should take place at the lowest minima available to the crew, or the crew's operating minima should be increased accordingly. The use of an FSTD is essential.

This NPA proposes that each crew member conduct successfully an approach and landing and an approach and go-around every year.

This NPA also proposes that any aerodrome used for HELI SA CAT I approach operations should be considered Category C. This should ensure that the commander:

— has sufficient knowledge of the eligibility of the landing system;

— has sufficient knowledge of the HELI SA CAT I operating minima, including the planning minima;

— has sufficient knowledge of the radio altimeter cross-check procedure, considering the local geography on a given CAT I ILS procedure;

— is aware of any local considerations.

(g) FAA COPTER CAT II

The FAA allows authorised helicopter operators to fly DHs of 100 ft on a CAT II landing system. The FAA also allows helicopters to use half the RVR available to Category A aeroplanes, but no less than 350 m, on any given CAT I approach.

The FAA approach is described under the following link:

http://fsims.faa.gov/WDocs/8700.1%20GA%20Ops%20Insp%20Handbk/Volume%202/2_059_00.htm

(h) Multi-crew operations with a technical crew member (TCM)

The TCM is expected to be either a HEMS TCM, a NVIS TCM, or both.

The training of the TCM is based on the proposed training programme of the HEMS TCM, as published in NPA 2018-04 'Helicopter emergency medical services performance and public interest sites' (RMT.0325 & RMT.0326 (OPS.057(a) & OPS.057(b))[13].

A HEMS TCM that is provided with training towards the monitoring and navigation functions under HEMS should not be required to undergo additional training under the HELI SA CAT I specific approval.

(i) Single-pilot operations

Single-pilot operations are not eligible to HELI SA CAT I. However, helicopters operated single-pilot, including helicopters operated under NCO, may be operated under standard CAT II if the helicopter is certified for single-pilot CAT II.

(j) Rotorcraft flight manual limitations

— Many helicopters in the current fleet have a minimum DH of 200 ft in the limitations section of the flight manual. However, this is essentially because the manufacturers didn't demonstrate lower decision heights yet. The flight manuals of modern helicopters may be modified without changes to the helicopter itself.

— Until the helicopters have lower decision heights, the lower RVRs for a given decision height and the alternative planning minima at the destination alternate remain applicable under the proposed specific approval.

29. The following GM6 SPA.LVO.100(c) is inserted:

GM6 SPA.LVO.100(c) Low-visibility operations and operations with operational credits

HELICOPTER SPECIFIC APPROVAL CATEGORY I (HELI SA CAT I) OPERATIONS

HELI SA CAT I is an operational credit that exploits a navigation solution with superior performance to that required for standard CAT I by extending the instrument segment of CAT I approach operations. This navigation solution may be an ILS installation with the necessary performance coupled to a suitably certified 4-axis autopilot capable of handling low speeds, together with the superior outside visibility of the helicopter on the visual segment, and the go-around performance of a helicopter. The extended instrument segment means that the DH can be reduced from the standard minimum of 200 ft down to 150 or 130 ft. The lower DH allows a corresponding reduction in the RVR required for the approach.

[13] https://www.easa.europa.eu/document-library/notices-of-proposed-amendment/npa-2018-04

HELI SA CAT I is not a separate approach classification, it is an operational credit applied to a CAT I operation.

Explanatory note to GM6 SPA.LVO.100(c)

This NPA proposes this new GM to achieve the specific objective described in Section 2.3.1: Enable onshore IFR operations by providing additional options: Increase the number of available and accessible alternates within the available fuel range.

The use of operational credit under CAT I rather than the use of the CAT II definition is a pragmatic solution to avoid any ATM/ANS-related issues with CAT II operations on CAT I navigation aids, to aerodromes not designed for CAT II operations.

The use of CAT II was initially considered for alignment with the FAA COPTER CAT II approval concept, and was dismissed for the reason above.

The GM is based on a copy-paste of GM2 SPA.LVO.100(c) applicable to aeroplanes and previously published in NPA 2018-06(C).

30. AMC2 SPA.LVO.105 is deleted.

~~AMC2 SPA.LVO.105 LVO approval~~

~~OPERATIONAL DEMONSTRATION – HELICOPTERS~~

Explanatory note

This NPA proposes the deletion of this AMC2 to achieve the specific objective described in Section 2.3.3: Compatibility with NPA 2018-06(C).

The new AMC2 SPA.LVO.105(f) ‘Safety assessment prior to obtaining an approval’ introduced by NPA 2018-06(C) mandates that the data and performance indicators in accordance with the new AMC1 SPA.LVO.105(f) be used by the operator for conducting a safety assessment prior to obtaining a specific approval. This safety assessment is proposed to replace the ‘operational demonstration’ currently required by AMC1 SPA.LVO.105 and AMC2 SPA.LVO.105. The new AMC clarifies that the intent of this data collection is to demonstrate that the operation will achieve an acceptable level of safety.

SUBPART H

HELICOPTER OPERATIONS WITH NIGHT-VISION IMAGING SYSTEMS

31. The following AMC1 SPA.NVIS.120 is inserted:

AMC1 SPA.NVIS.120 Operating minima for night-vision imaging systems (NVISs)

NVIS OPERATIONS UNDER IFR

(a) Any limitation in the rotorcraft flight manual should be complied with.

(b) Night-vision goggles may be used in a flipped-down position during a flight under IFR:

(1) under VMC;

(2) under IMC:

(i) in preparation of the visual segment of an instrument approach or a visual approach;

(ii) during the visual segment of an instrument approach or departure;

(iii) during a visual approach;

(iv) in preparation of a transition to VFR.

(c) The pilot-in-command/commander should not proceed on a visual segment of an IFR flight unless the visual cues are assessed unaided.

(d) The pilot-in-command/commander should not proceed VFR unless the VFR weather minima are assessed unaided.

Explanatory note to AMC1 SPA.NVIS.120

This addition is intended to achieve the specific objective described under Section 2.3.1: Enable onshore IFR operations by providing additional options: Use of NVIS on the visual segment of an IFR flight.

This NPA proposes to create this new AMC as it:

— provides means of compliance for the use of NVIS on the visual segment of IFR flights, and in the transition phase from instrument to visual flight and vice versa;

— maintains the principle that there will be no operational credit for NVISs, as defined in the implementing rules section;

— makes use of existing provisions under AMC1 SPA.NVIS.140 to ensure that standard operating procedures (SOPs) will be defined for such operations;

— makes use of the new AMC1 SPA.NVIS.130 for the provision of training to the crew.

32. The following GM1 SPA.NVIS.120 is inserted:

GM1 SPA.NVIS.120 Operating minima for night-vision imaging systems (NVISs)

NVIS OPERATIONS UNDER IFR

(a) The use of NVIS may be beneficial to improve the situational awareness of the crew under VMC.

(b) Approaches under IFR have a visual segment, which may be a visual segment of an instrument approach or a visual approach. The use of NVIS might be beneficial to improve the safety of the visual segment of an IFR flight, as well as to improve situational awareness.

(c) A flight may be completed partly under IFR and partly under VFR. The use of NVIS might be beneficial to improve the safety during the transition to VFR, for example when flying a point-in-space (PinS) approach with instructions to 'proceed VFR' and proceed visually.

(d) The use of night-vision goggles in a flipped-down position does not prevent to assess the 'unaided' condition by looking out below the goggles.

Explanatory note

This addition is intended to achieve the specific objective described in Section 2.3.1: Enable onshore IFR operations by providing additional options: Use of NVIS on the visual segment of an IFR flight.

This NPA proposes to create this new GM to explain when and how a NVIS may be useful under IFR.

33. The following AMC1 SPA.NVIS.130 is inserted:

AMC1 SPA.NVIS.130 Crew requirements for night-vision imaging systems (NVISs)

NVIS OPERATIONS UNDER IFR

(a) The minimum crew should be two pilots, or one pilot and one NVIS technical crew member.

(b) The crew training and experience should ensure:

  (1) efficient scanning of the instruments with the night-vision goggles (NVGs) flipped up or down as defined in the standard operating procedures (SOPs);

  (2) proficiency during the transition phase;

  (3) proficient use of the NVGs on the visual segments of the flight during which they are expected to be used;

  (4) the continuity of the crew concept.

(c) A crew member that is involved in NVIS operations under IFR should undergo initial and recurrent training using a suitable FSTD as part of the normal crew complement. The training should cover at least the following items under a variety of weather conditions and cultural lighting:

  (1) transition from instrument to visual flight during the final approach;

  (2) transition from visual to instrument flight on departure.

(d) The training should have a validity of 12 calendar months. The validity period should be counted from the end of the month when the training was taken. When the training is undertaken within the last 3 months of the validity period, the new validity period should be counted from the previous expiry date.

Explanatory note to AMC1 SPA.NVIS.130

This addition is intended to achieve the specific objective described in Section 2.3.1: Enable onshore IFR operations by providing additional options: Use of NVIS on the visual segment of an IFR flight.

This NPA proposes to create this new AMC to introduce provisions for crew composition and crew training for the use of NVIS under IFR.

Due to the workload and complexity of the transition phase from instrument to visual flight, and considering the additional task of scanning the environment unaided and with the use of NVGs, this kind of operation is assumed to require a minimum crew of two.

The crew training should include a variety of weather conditions, including conditions close to IFR minima, and a variety of lighting conditions. Considering the risk of mishandling of the helicopter at low height during training, this NPA proposes that a suitable FSTD should be used.

This NPA proposes provisions for training, not for checking, under the rotorcraft roadmap policy to provide pilots with more training and less checking.

34. AMC1 SPA.NVIS.130(f) is amended as follows:

AMC1 SPA.NVIS.130(f) Crew requirements for NVIS operations

CHECKING OF NVIS CREW MEMBERS

(a) The operator proficiency check and line check required in SPA.NVIS.130(f) should have a validity of 12 calendar months. The validity period should be counted from the end of the month when the training was taken. When the check is undertaken within the last 3 months of the validity period, the new validity period should be counted from the previous expiry date.

(b) These ~~The~~ checks ~~required in SPA.NVIS.130 (f)~~ may be combined with those checks required for the underlying activity.

Explanatory note to AMC1 SPA.NVIS.130(f)

This NPA proposes to introduce clarity regarding the validity of NVIS checking.

35. GM1 SPA.NVIS.140 is amended as follows:

GM1 SPA.NVIS.140 Information and documentation

CONCEPT OF OPERATIONS

[…]

CONCEPT OF OPERATION — NVIS OPERATIONS UNDER IFR

The NVIS can be useful to assess the environment when not in a cloud layer, if procedures are established for its use. It may also be useful for decision-making before cancelling IFR and during the transition from instrument flight to visual flight under IFR.

During departure, the NVIS provides extra safety if used correctly. This is especially true for a departure where the instruction is to proceed visually from the FATO to the initial departure fix (IDF), where there is no obstacle surface protection. It could also be useful for other instrument departures.

During the transition to visual flight, the NVIS provides additional safety because the visibility may be very different with or without the NVIS, and it may help to assess the situation.

The scanning of instruments and of external cues will be modified. Multi-crew operations with standard operating procedures (SOPs) and the relevant training should be in place.

Operator SOPs may define that when one of the crew members uses the night-vision goggles (NVGs) in a flipped-down position, the other should have the NVGs flipped up and should monitor the flight instruments and navigation instruments used for the flight. In some situations and operations, it might also be possible to look below the NVGs to monitor both the instruments and the VMC situation.

[…]

Table of contents

3. SYSTEM DESCRIPTION

[…]

3.2.1 NVG design characteristics

There are limitations inherent in the current NVG design.
[…]

3.2.1.7 LED lights

Some red obstacle lights and other artificial lights that are clearly visible to the naked eye are not visible to NVGs. These obstacle lights may employ LED instead of traditional incandescent sources. The use of LED lights is becoming more common for almost all lighting applications because of their extensive lifetime and low energy consumption.

Aviation red light ranges from about 610 to 700 nanometres (nm), and NVGs approved for civil aviation (having a Class B Minus Blue Filter) are only sensitive to energy ranging from 665 to about 930 nm. LED and other artificial lights may have a relatively narrow emission band (around 630 nm ± 20 nm) and that band is below the range in which NVGs are sensitive and LEDs do not emit infrared energy like incandescent lights for obstacle red light.

In general terms, NVG users should be aware that obstacle lighting systems and other artificial lights that fall outside the combined visible and near-infrared spectrum of NVGs (approximately 665 to 930 nm) will not be visible to their goggles. Other obstacle lights may use a wavelength very close to the approximate cut-off wavelength of 665 nm and will remain visible to the goggles, but they will be dimmed and will be better seen with the naked eye.

Full awareness of obstacle lights can only be achieved with an unaided scan.

[…]

3.2.2.6 Instrument lighting brightness considerations

When viewing the NVG image, the brightness of the image will affect the amount of time it takes to adapt to the brightness level of the instrument lighting, thereby affecting the time it takes to interpret information provided by the instruments. The higher the quality (figure of merit (FOM), resolution, filters, contrast, etc.) of the 'tubes', the less critical this effect becomes.

For example, if the instrument lighting is fairly bright, the time it takes to interpret information provided by the instruments may be instantaneous. However, if the brightness of the lighting is set to a very low level, it may take several seconds to interpret the information, thus increasing the heads-down time and increasing the risk of spatial disorientation. It is important to ensure that instrument lighting is kept at a brightness level that makes it easy to rapidly interpret the information. If the NVGs are used in the transition phase from IFR to VFR, the brightness level of the instrument lighting should be set in advance.

[…]

4. OPERATIONS

[…]

4.2.2.2 Artificial illumination

Since the NVGs are sensitive to any source of energy in the visible and near-infrared spectrums, there are also many types of artificial illumination sources (e.g.~~,~~ flares, IR searchlights, cultural lighting, etc.). As with any illumination source, these can have both positive and detrimental effects on NVG utili~~z~~sation. For example, viewing a scene indirectly illuminated by a searchlight can enable the pilot to more clearly view the scene; conversely, viewing the same scene with the searchlight near or within the NVG field of view will reduce the available visual cues. It is important to be familiar with the effects of cultural lighting in the flying area in order to be able to avoid the associated problems and to be able to use the advantages provided. Also, it is important to know how to properly use artificial light sources (e.g.~~,~~ aircraft IR spotlight). It should be noted that artificial light sources may not always be available or dependable, and this should be taken into consideration during flight planning.

When using NVGs in an area with high-intensity cultural lighting, the lights beyond this area may not be visible. The visibility assessed with the NVGs might be judged to be worse than the unaided visibility.

4.4.1.1.3 Unaided scan

Under certain conditions, this scan can be as important as the others can. For example, it may be possible to detect distance and/or closure to another aircraft more easily using unaided vision, especially if the halo caused by the external lights ~~is masking~~ masks aircraft detail on the NVG image. Additionally, there are other times when unaided information can be used in lieu of or can augment NVG and instrument information.

When using the NVGs in the transition from IFR to VFR, the unaided scan is essential to assess the unaided visibility conditions. Focusing on the first light seen when looking out is an automatic response, but it is vital to continue the scan in order to assess the surrounding weather conditions.

Some examples where unaided scan can enhance safety is where LED-lit obstacles can be encountered (e.g. during low-altitude flying and when performing a reconnaissance of landing areas) or when unmanned aircraft systems (UASs) fly at night with LED navigation lights.

Air operators should incorporate procedures into their manuals and/or standard operating procedures (SOPs) that require periodic unaided scanning when operating at low altitudes, when looking for potential landing areas, and when performing a reconnaissance of a landing area. This may be accomplished by looking under the NVGs, or by briefly placing NVGs in the stowed (flipped-up) position. Manuals/SOPs should include procedures and call-outs for LED-lit obstacles.

Air operators and pilots are encouraged to report encounters with obstacles equipped with LED lighting systems not visible by NVGs, with pertinent information, to their competent authority.

[…]

5. TRAINING

To provide an appropriate level of safety, training procedures must accommodate the capabilities and limitations of the systems described in Section 3 of this GM as well as the restraints of the operational environment.

To be effective, the NVIS training philosophy would be based on a two-tiered approach: basic and advanced NVIS training. The basic NVIS training would serve as the baseline standard for all individuals seeking an NVIS endorsement. The content of this initial training would not be dependent on any operational requirements. The advanced training would build on the basic training by focusing on developing specialised skills required to operate an aircraft during NVIS operations in a particular operational environment. Furthermore, while there is a need to stipulate minimum flight hour requirements for an NVIS endorsement, the training must also be event based. This necessitates that pilots be exposed to all of the relevant aspects, or events, of NVIS flight in addition to acquiring a minimum number of flight hours.

Explanatory note to GM1 SPA.NVIS.140

This amendment is intended to achieve the specific objective described in Section 2.3.1: Enable onshore IFR operations by providing additional options: Use of NVIS on the visual segment of an IFR flight.

The proposed amendment describes the use of NVIS on the visual segment of IFR flights. The paragraph on training remains unchanged because it refers to Section 3, and Section 3 is updated to cover operations under IFR.

The proposal also incorporates the elements of SIB 2019-04 'Avoiding Obstacles Lighted with Light-Emitting Diode Obstacle Lights whilst Operating with Night Vision Goggles'[14] that are applicable to helicopter operators. The SIB will remain unchanged because it is also applicable to authorities and entities in charge of obstacle lighting.

[14] https://ad.easa.europa.eu/ad/2019-04

SUBPART K

HELICOPTER OFFSHORE OPERATIONS

36. The following AMC1 SPA.HOFO.125(g) is inserted:

AMC1 SPA.HOFO.125(g) Offshore standard approach procedures (OSAPs)

OSAP TRAINING AND CHECKING

(a) Initial training and checking for OSAPs should be conducted either as part of the operator's conversion course or as a separate equipment and procedure training, and should include all of the following:

 (1) ground training, including knowledge of:

  (i) the structure of the OSAP;

  (ii) the airborne radar specifications, limitations, modes, and usage;

  (iii) the area navigation system, as necessary for the envisaged OSAP;

 (2) aircraft/FSTD training, including all of the following:

  (i) OSAPs to various offshore sites with and without obstacles or obstructions;

  (ii) OSAPs in different wind conditions, followed by landings and go-arounds;

  (iii) OSAPs in the pilot-monitoring, pilot-flying and single-pilot functions, by day and by night, as relevant to the kind of operations;

 (3) line flying under supervision;

 (4) line check.

(b) The recurrent training and checking programme should include at least one OSAP per year in the pilot-monitoring, pilot-flying and single-pilot functions as relevant to the kind of operations. OSAPs should be part of the annual aircraft/FSTD training, the line check or the operator's proficiency check. If OSAPs are trained and not checked, then the training should achieve pilot proficiency to fly the OSAP.

Explanatory note to AMC1 SPA.HOFO.125(g)

This NPA proposes this addition to achieve the specific objective described in Section 2.3.2: Modernise offshore radar approaches.

The airborne radar approach (ARA) was initially developed for CAT, based on the training and checking of pilots as required under Part-CAT. Provisions for training need to be included in order to extend this kind of approach to non-CAT operations.

AMC1 SPA.HOFO.125(g) is not intended to increase the training requirements applicable to CAT operators that hold a SPA.HOFO approval. It only proposes to introduce equivalent training for NCC and SPO operators that use the ARA approach.

37. AMC1 SPA.HOFO.125 is amended as follows:

AMC1 SPA.HOFO.125 ~~Airborne radar approach~~ Offshore standard approach procedures (OSAPs) ~~(ARA) to offshore locations~~

~~Note: alternative approach procedures using original equipment manufacturer (OEM)-certified approach systems are not covered by this AMC.~~

AIRBORNE RADAR APPROACH (ARA) ~~GENERAL~~

[…]

Explanatory note to AMC1 SPA.HOFO.125

The title is changed to reflect the change in the title in the implementing rule. The note is deleted and replaced by a new AMC for original equipment manufacturer (OEM) approaches. The AMC discusses only ARA and is not extended to other offshore approaches, so the term 'AIRBORNE RADAR APPROACH (ARA)' is reintroduced in the subheading. The contents of the AMC remain unchanged.

With regard to the new definitions, an OSAP (or ARA) approach should be considered to be Type A approach (which requires an MDA/H ≥ 250 ft) with operational credit (as the actual MDA/H = 200 ft, but not less than 50 ft above the elevation of the helideck). The operational credit can be explained by the use of the radio altimeter.

38. The following AMC2 SPA.HOFO.125(f) is inserted:

AMC2 SPA.HOFO.125(f) Offshore standard approach procedures (OSAPs)

ORIGINAL EQUIPMENT MANUFACTURER (OEM) — CERTIFIED APPROACH SYSTEM

Where an OSAP is conducted to a non-moving offshore location (i.e. fixed installation or moored vessel), and an original equipment manufacturer (OEM) certified approach system is available, the use of automation to reach a reliable GNSS position for that location should be used to enhance the safety of the OSAP.

The OSAP should meet the following requirements:

(a) The OEM-certified approach system should be approved in accordance with the applicable airworthiness requirements for operations at night and in IMC.

(b) The aircraft should be equipped with a radar altimeter (RA) and a suitable airborne radar.

(c) The GNSS position of the installation should be retrieved from the area navigation system database or by manual entry if the aircraft flight management system will allow for that.

(d) The approach system vertical path should be a Baro-VNAV or a GNSS SBAS vertical source type. The radar height (RH) should be cross-checked (either automatically or by the crew) to avoid wrong vertical parallel descent due to erroneous QNH selection.

(e) The descent angle should be of a maximum of 4°. Up to 6° could be acceptable only if the GS is reduced to 60 kt.

(f) Minimum descent height (MDH) should not be less than 50 ft above the elevation of the helideck:

(1) the MDH for an airborne radar approach should not be lower than:

(i) 200 ft by day; or

(ii) 300 ft by night; and

(2) the MDH for an approach leading to a circling manoeuvre should not be lower than:

(i) 300 ft by day; or

(ii) 500 ft by night.

(g) The minimum descent altitude (MDA) may only be used if the radio altimeter is unserviceable. The MDA should be a minimum of the MDH + 200 ft, and be based on a calibrated barometer at destination or on the lowest forecast barometric pressure adjusted to sea level (QNH) for the region.

(h) The MDA/MDH for a single-pilot ARA should be 100 ft higher than that calculated in accordance with (f) and (g) above. The decision range should not be less than 1 NM.

(i) The approach system lateral path guidance should be capable of at least performance monitoring and alerting function of RNP 0.3 NM up to the missed approach point (MAPt), then RNP 1.0 NM to missed approach holding point.

(j) The horizontal flight path should be defined in accordance with the RNP capability of the approach system (e.g. offset no lower than the RNP capability).

(k) The maximum acceptable offset angle between the final inbound course and the installation should be 30°.

(l) Before commencing the final approach, the pilot-in-command/commander should ensure that a clear path exists on the radar screen for the final and missed approach segments. If lateral clearance from any obstacle will be less than the navigation performance, the pilot-in-command/commander should:

(1) approach to a nearby target structure and thereafter proceed visually to the destination structure; or

(2) make the approach from another direction leading to a circling manoeuvre.

(m) The minimum decision range (MDR) should not be less than 0.75 NM. The maximum acceptable GS at the MAPt for a 0.75-NM MDR should be 80 kt.

(n) The segment from the MAPt to destination should not be flown in tailwind conditions. The approach course should be selectable accordingly.

(o) The aircraft should have the capability to compare the airborne radar picture and GNSS range and bearing data to cross-check the position of the offshore location.

Explanatory note AMC2 SPA.HOFO.125(f)

This NPA proposes this addition to achieve the specific objective described in Section 2.3.2: Modernise offshore radar approaches.

This NPA proposes a new AMC on OEM designed offshore approaches:

The OEM designed approaches are defined in the flight manuals, and cannot be changed. If meeting a certain standard and used in the proper way, they may achieve equivalent results to the airborne radar approach and even optimise the flight path. OEM designed approaches may make better use of automation by providing AFCS modes and FMS approach designs that are built for purpose.

The aim of this new AMC is to provide OEMs and operators with means of compliance for the use of these new approaches including:

— speeds,
— minimum heights,
— descent angles,
— distance to obstacles,
— use of GNSS.

This NPA proposes to use SBAS, based on the limited research performed so far, including UK CAA paper 2010/01. In order to cross-check the SBAS altitude with the radio altimeter, geometric altitude display may be useful. Also, SBAS should be considered to be available only if within the SBAS coverage. Finally, the AMC may need to be updated if new data or research becomes available.

Minimum heights and decision ranges are currently the same as the radar approach because OEM designs are not considered to allow for lower minima. Also, in marginal weather conditions and at night, the visual segment of the flight is a limiting factor and does not need to be shortened.

The AMC allows for OEM designs that use a flight path with either a lateral offset, or an offset initiation point (OIP), or both.

It should be stressed that paragraph (i) is a requirement for the monitoring and alerting function, and does not require full RNP 0.3 capability.

39. GM1 SPA.HOFO.125 is amended as follows:

GM1 SPA.HOFO.125 ~~Airborne radar approach (ARA) to offshore locations~~ Offshore standard approach procedures (OSAPs)

AIRBORNE RADAR APPROACH (ARA)

[…]

Explanatory note to GM1 SPA.HOFO.125

Only the title is changed to reflect the change in the title in the implementing rule. The GM discusses only ARA and is not extended to other offshore approaches, so the term ‘AIRBORNE RADAR APPROACH (ARA)’ is reintroduced in the subheading.

40. GM2 SPA.HOFO.125 is amended as follows:

GM2 SPA.HOFO.125 ~~Airborne radar approach (ARA) to offshore locations~~ Offshore standard approach procedures (OSAPs)

GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS)/AREA NAVIGATION SYSTEM — AIRBORNE RADAR APPROACH (ARA)

Where an ARA is conducted to a non-moving offshore location (i.e. fixed installation or moored vessel), and the GNSS/area navigation system is used to enhance the safety of the ARA, the following procedure or equivalent should be applied:

(a) selection from the area navigation system database or manual entry of the offshore location;

(b) manual entry of the final approach fix (FAF) or intermediate fix (IF), as a range of and bearing from the offshore location;

(c) ~~operation of the GNSS equipment in terminal mode;~~ the full-scale deviation of the GNSS/area navigation system display should be in accordance with the expected navigation performance, and be no greater than 1 NM;

(d) comparison of weather radar and GNSS range and bearing data to cross-check the position of the offshore location;

(e) use of GNSS guidance to guide the aircraft onto the final approach track during the initial or intermediate approach segments;

(f) use of GNSS guidance from the FAF towards the offset initiation point (OIP) during the final approach segment to establish the helicopter on the correct approach track and, hence, heading;

(g) transition from GNSS guidance to navigation based on headings once the track is stabilised and before reaching OIP;

(h) use of GNSS range of and bearing to the offshore location during the intermediate and final approach segments to cross-check weather radar information (for correct 'painting' of the destination and, hence, of other obstacles);

(i) use of GNSS range of the offshore location to enhance confidence in the weather radar determination of arrival at the OIP and MAPt; and

(j) use of GNSS range of and bearing to the destination to monitor separation from the offshore location.

Explanatory note to GM2 SPA.HOFO.125

The GM is updated to match latest technologies and definitions, as prescribed in the specific objective described in Section 2.3.3.

41. The following Subpart N to the AMC/GM to Part-SPA is added:

SUBPART N

HELICOPTER POINT IN SPACE APPROACHES AND DEPARTURES WITH REDUCED VFR MINIMA

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

GENERAL

(a) Part-SERA operating minima should apply under VFR, unless one of the following applies:

(1) the VFR segment of the flight follows a PinS approach and the distance from the missed approach point (MAPt) to the destination is less than 3 km.

(2) the VFR segment of the flight is a departure with the intention to transition to IFR at the IDF and the distance from the take-off to the initial departure fix (IDF) is less than 3 km.

(b) By day, if either (a)(1) or (a)(2) applies, the operating minima in Tables 1 and 2 should apply.

(c) By night, if either (a)(1) or (a)(2) applies, the operating minima in Tables 3 and 4 should apply.

Table 1

VFR operating minima BY DAY **when instructed to 'proceed VFR' following an instrument approach**		
x is the distance between the missed approach point (MAPt) and the heliport or operating site		
x	Visibility	Ceiling
x < 1 000 m	1 000 m	MDH (at least 300 ft)
1 000 m ≤ x ≤ 3 000 m	x or 1 500 m, whichever is lower	MDH (at least 400 ft)

Note: In Class B/C/D airspace, a special VFR clearance is needed and may require higher minima in accordance with local airspace restrictions.

Table 2

VFR operating minima BY DAY **when instructed to 'proceed VFR' prior to an IFR departure**		
x is the distance between the heliport or operating site and the initial departure fix (IDF)		
x	Visibility	Ceiling
x < 1 000 m	1 000 m	MDH (at least 300 ft)
1 000 m ≤ x ≤ 3 000 m	x or 1 500 m, whichever is lower	MDH (at least 400 ft)

Note: In Class B/C/D airspace, a special VFR clearance is needed and may require higher minima in accordance with local airspace restrictions.

Table 3

VFR operating minima by NIGHT when instructed to 'proceed VFR' following an instrument approach		
x is the distance between the missed approach point (MAPt) and the heliport or operating site		
x	Visibility	Ceiling
x < 1 000 m	2 000 m	MDH (600 ft min)
1 000 m ≤ x ≤ 3 000 m	x + 1 000 m	MDH + 200 ft (600 ft min)

Table 4

VFR operating minima by NIGHT when instructed to 'proceed VFR' prior to an IFR departure		
x is the distance between the heliport or operating site and the initial departure fix (IDF)		
x	Visibility	Ceiling
x < 1 000 m	2 000 m	MCA (600 ft min)
1 000 m ≤ x ≤ 3 000 m	x + 1 000 m	MCA + 200 ft (600 ft min)

(d) The operator should define standard operating procedures (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.

(e) The operator should provide a thorough description of the following elements; the description may be provided by means of a chart and should be included in the operations manual or other document:

(1) the environment in the vicinity of the VFR segment of the flight;

(2) the visual cues that are useful for the purpose of VFR navigation and that should be available on departure or for the continuation of the flight at the MAPt;

(3) the relevant obstacles.

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

(g) The operator should encourage occurrence reporting and have a safety analysis capability.

(h) The pilot-in-command/commander should have at least 1 000 hours of flying experience on helicopters, and 100 hours of instrument time on helicopters.

(i) The pilot-in-command/commander should undergo initial and yearly recurrent FSTD training or checking, covering the following items:

(1) 3D approach operation to minima;

(2) go-around on instruments;

(3) 2D approach operation to minima;

(4) at least one of the 3D or 2D approach operations should be a PinS approach followed by a transition to VFR and a VFR landing;

(5) in the case of multi-engined helicopters, a simulated failure of one engine should be included in either the 3D or 2D approach operation to minima;

(6) where appropriate to the helicopter type, approach with flight control system/flight director system malfunctions, flight instrument and navigation equipment failures;

(7) recovery from unusual attitudes by instrument;

(8) loss of VMC during the VFR segment of flight;

(9) VFR departure followed by a manoeuvre back to the take-off location;

(10) VFR departure to the IDF followed by an IFR departure.

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

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

Explanatory note to AMC1 SPA.PINS-VFR.100

This new specific approval is intended to achieve the specific objective described in Section 2.3.1: Enable onshore IFR operations by providing additional options: Reduced minima on mixed IFR/VFR flights.

The proposal is similar to the draft amendment to the HEMS operating minima, as proposed in NPA 2018-04 (see relevant extracts in Section 2.3.2.2 of this NPA). The operating minima are proposed to be higher than to the equivalent HEMS operating minima, and the training requirements are proposed to be lower.

The operating minima defined under Part-SERA are considered to be already very low by day:

— Class F and G airspace: visibility 1 500 m (which may be reduced to 800 m in some Member States), clear of cloud, and in sight of the surface.

— Class B–E airspace: visibility 5 000 m and distance to clouds 1 000 ft. Under special VFR: visibility 1 500 m (which may be reduced to 800 m for helicopters), and ceiling 600 ft.

By day, the visibility need not be reduced. In some cases, it may need to be increased above 800 m to increase the safety during the transition from IFR/IMC to VFR, which transition is considered to be very sensitive. The ceiling may need to be reduced by day as it is expected that a short cruise phase at MDH under VFR with marginal weather conditions will be necessary before the descent can take place.

By night, the operating minima defined under Part-SERA are as follows:

— 5 000 m visibility and ceiling 1 500 ft.

— Class B–E airspace under special VFR: ceiling and visibility may be reduced, but ceiling may not be reduced below 600 ft.

By night, there is a wide range of weather conditions where the VFR segment of the flight can take place safely and can be allowed to take place if the VFR operating minima are reduced.

It is also expected that a short cruise phase at MDH under VFR with marginal weather conditions will be necessary before the descent can take place. The VFR ceiling minima may need to be reduced for the duration of this very short cruise.

The transition from IFR to marginal VFR, and the short VFR cruise are operations that require standard operating procedures (SOPs), knowledge of environmental cues that are useful for VFR navigation, and most importantly, experience and training.

SOPs are expected to be described in the operations manual. An alternative to providing charts in the operations manual is provided for NCO operators.

If the distance from the heliport/operating site to either the MAPt or the IDF is greater than 3 000 m, the VFR operating minima published under Part-SERA should apply. This distance could be increased, but this would require a crew with much more experience and training.

The training and checking elements that are provided under Part-CAT, and which are considered essential for such operations, are extended to non-CAT operators that request this special approval. Additional training elements are added to cover the specific issues pertaining to operations. CAT operators need not duplicate the training and checking elements that are already in place.

The use of a suitable FSTD is considered to be needed for the proposed training.

Finally, the reference to the Part-SERA minima in the new Subpart SPA-PINS is introduced to ensure that the SPA.PINS-VFR approval is not compatible with the reduced VFR minima provided under SPA.HEMS.

The specific approval is accessible to CAT (other than HEMS), NCC, SPO and NCO operators, with access to a suitable FSTD for their helicopter type.

The proposed VFR operating minima are valid for all classes of airspace, and are based only on the capability of the pilots to fly and navigate visually, because they do not need to take into account traffic deconfliction.

— At altitudes close to the MDH and within a 3-km radius of the MAPt or IDF, there should be no conflicting IFR traffic, because any IFR traffic will be much higher, or the conflict will be worse under IFR:
    — once the departing VFR helicopter reaches the IDF, it transitions to IFR and climbs;
    — or if the approaching IFR helicopter goes around at or before the MAPt instead of flying the VFR segment.
— If in use, the weather conditions will be IMC except for helicopters that use this SPA. No conflicting VFR traffic should exist.
— Only in case a helicopter transitions to VFR near the MAPt while another helicopter departs VFR to an IDF under the same SPA, and the IDF is close to or co-located with the MAPt, can a traffic conflict exist. Considering the very short distances and durations of the VFR segments of flight, the traffic should already be deconflicted for the purpose of the IFR segments.

ANNEX VI

NON-COMMERCIAL AIR OPERATIONS WITH COMPLEX MOTOR-POWERED AIRCRAFT

[PART-NCC]

1. AMC3 NCC.OP.110 is amended as follows:

AMC3 NCC.OP.110 Aerodrome operating minima — general

TAKE-OFF OPERATIONS

[…]

(c) Required RVR or VIS

[…]

(2) Helicopters:

(i) For helicopters having a mass where it is possible to reject the take-off and land on the FATO in case of the critical engine failure being recognised at or before the take-off decision point (TDP), the operator should specify an RVR~~/~~ or VIS as take-off minimum in accordance with Table 1.H.

(ii) For all other cases, the pilot-in-command should operate to take-off minima of 800 m RVR~~/~~ or VIS and remain clear of cloud during the take-off manoeuvre until reaching the performance capabilities of (c)(2)(i).

~~(iii) Table 5 for converting reported meteorological visibility to RVR should not be used for calculating take-off minima.~~

(iii) For point-in-space (PinS) departures to an initial departure fix (IDF), the take-off minima should be selected to ensure sufficient guidance to see and avoid obstacles and return to the heliport if the flight cannot continue visually to the IDF.

Table 1.H: Take-off — helicopters (without an approval for LVTO ~~approval~~)

RVR~~/Visibility~~ or VIS

Onshore aerodromes or operating sites with instrument flight rules (IFR) departure procedures	**RVR/ or VIS (m)****
No light and no markings (day only)	400 or the rejected take-off distance, whichever is the greater
No markings (night)	800
Runway edge/FATO light and centre line marking	400
Runway edge/FATO light, centre line marking and relevant RVR information	400
Offshore helideck*	
Two-pilot operations	400
Single-pilot operations	500

*: The take-off flight path to be free of obstacles.

** On PinS departures to IDF, RVR should be not less than 800 m and ceiling should be not less than 250 ft.

Explanatory note to AMC3 NCC.OP.110

This amendment is intended to achieve the specific objective described in Section 2.3.3: Implementation of the new definitions; Minor changes to reflect the operational capabilities of helicopters; Introduction of helicopter PinS approaches to reflect the recent evolution of ICAO Doc 8168 (PANS-OPS), and simplification.

Paragraph (b)(iii) and new footnote (**) in Table 1.H:

By procedure design, the capability is required to manoeuvre and land in case of any unforeseen event during the visual segment to the IDF. The operating minima of the helicopter circling manoeuvre are proposed.

Other changes:

The other changes are editorial corrections which are proposed to standardise the wording of the helicopter regulatory material following the changes to the aeroplane regulations as per NPA 2018-06(C).

2. AMC4 NCC.OP.110 is amended as follows, using NPA 2018-06(C) as a starting point:

AMC4 NCC.OP.110 Aerodrome operating minima — general

DETERMINATION OF DH/MDH FOR INSTRUMENT APPROACH OPERATIONS — AEROPLANES

(a) The decision height (DH) to be used for a 3D ~~approach operation~~ or a 2D approach operation flown with the CDFA technique should not be lower than the highest of:

(1) the obstacle clearance height (OCH) for the category of aircraft used;

(2) the published approach procedure DH or MDH where applicable;

(3) the system minimum specified in Table 3;~~.A;~~

(4) the minimum DH permitted for the runway specified in Table 4.A; or

(5) the minimum DH specified in the AFM or equivalent document, if stated.

(b) The minimum descent height (MDH) for a 2D approach operation flown without the CDFA technique should not be lower than the highest of:

(1) the OCH for the category of aircraft used;

(2) the published approach procedure MDH where applicable;

(3) the system minimum specified in Table 3;~~.A;~~

(4) the lowest MDH permitted for the runway specified in Table 4.A; or

(5) the lowest MDH specified in the AFM, if stated.

DETERMINATION OF DH/MDH FOR INSTRUMENT APPROACH OPERATIONS — HELICOPTERS

(c) The DH or MDH should not be lower than the highest of:

(1) the OCH for the category of aircraft used;

(2) the published approach procedure DH or MDH where applicable;

(3) the system minimum specified in Table 3;

(4) the lowest DH or MDH permitted for the runway/FATO specified in Table 4.H; or

(5) the lowest DH or MDH specified in the AFM, if stated.

Table 3~~.A~~: System minima

Facility	Lowest DH/MDH (ft)
ILS/MLS/GLS	200
GNSS/SBAS (LPV)	200*
GNSS (LNAV)	250
GNSS/Baro-VNAV (LNAV/VNAV)	250
Helicopter point-in-space (PinS) approach	250**
LOC with or without DME	250
SRA (terminating at ½ NM)	250
SRA (terminating at 1 NM)	300
SRA (terminating at 2 NM or more)	350
VOR	300
VOR/DME	250
NDB	350
NDB/DME	300

Facility	Lowest DH/MDH (ft)
VDF	350

* For LPV, a DH of 200 ft may be used only if the published FAS datablock sets a vertical alert limit not exceeding 35 m. Otherwise, the DH should not be lower than 250 ft.

** For PINs approaches with instructions to 'proceed VFR', (minimum) decision height ((M)DH) should be with reference to the ground below the missed approach point (MAPt).

Table 4.H: Type of runway/FATO v lowest DH/MDH — HELICOPTERS

Type of runway/FATO	Lowest DH/MDH (ft)
Precision approach runway, Category I Non-precision approach runway Non-instrument runway	200 ft
Instrument FATO FATO	200 ft 250 ft

Note: A helicopter point-in-space (PinS) approach with instructions to 'proceed VFR' is not directly related to the nearest FATO or runway, because the flight can continue VFR to any destination after the PinS.

Table 4.H does not apply to helicopter PinS approaches with instructions to 'proceed VFR'.

Explanatory note to AMC4 NCC.OP.110

This NPA proposes additional changes to AMC4 NCC.OP.110 created by NPA 2018-06(C).

This amendment is intended to achieve the specific objective described in Section 2.3.3: Implementation of the new definitions; Minor changes to reflect the operational capabilities of helicopters; Introduction of helicopter PinS approaches to reflect the recent evolution of ICAO Doc 8168 (PANS-OPS), and simplification.

Explanatory note to paragraph (c):

Helicopters need a specific paragraph to introduce the calculation of the DHs and MDHs because of the following:

Helicopters need to refer to separate calculation tables; see explanatory note to Tables 4.H and 8.1.H.

Helicopter operating minima need not distinguish between Type A approaches using CDFA, Type A approaches not using CDFA, and Type B approaches; see below.

Helicopter operating minima should not be increased when not using the CDFA technique; see explanatory note to AMC3 CAT.OP.MPA.110.

With helicopters, there is no need to add an increment to the MDH when converting it into a DH for the purpose of using the CDFA technique; see explanatory note to AMC3 CAT.OP.MPA.110.

Explanatory note to Table 3:

Table 3 is extended to helicopters because the system minima are not aircraft related. Helicopter PinS approaches are a separate kind of approach in PANS-OPS, so they need to be introduced in the list of approach types.

Helicopter PinS approaches with instructions to 'proceed VFR' are cloud-breaking procedures that may be used to continue flight under VFR to an unspecified destination. As opposed to other IFR procedures, it may not be possible to determine the DH/MDH with reference to a given heliport or runway threshold. An alternative solution is proposed in a footnote.

Explanatory note to Tables 4.H and 8.1.H:

The minimum RVR for helicopters is 500 m.

Runways: The obstacle protection of a non-instrument runway is far greater than the obstacle protection of an instrument FATO. There should therefore be no increase in minima based on the type of runway. Any runway is also much bigger than an instrument FATO. No increase in the operating minima should apply. See figure in explanatory note to AMC3 CAT.OP.MPA.110, Tables 4.H and 9.1.H.

Instrument FATO: The obstacle protection, lighting and minimum dimensions of an instrument heliport should be sufficient to avoid any increase in the operating minima. No increase in the operating minima should apply.

Non-instrument FATO: A helicopter PinS approach can be designed to a non-instrument FATO with instructions to 'proceed visually'. The minimum distance from the MAPt to the heliport is 1 000 m, in order to provide enough distance for the helicopter to decelerate from IFR speed and land. The minimum RVR is therefore 1 000 m to cover any deficiency in lighting or heliport dimensions.

3. AMC6 NCC.OP.110 is amended as follows:

AMC6 NCC.OP.110 Aerodrome operating minima — general

DETERMINATION OF RVR/CMV/VIS MINIMA FOR ~~NPA~~ TYPE A INSTRUMENT APPROACH, TYPE B CAT I INSTRUMENT APPROACH — HELICOPTERS

~~(a) For non-precision approach (NPA) operations the minima specified in Table 4.1.H should apply:~~

(a) The RVR/CMV should be not less than the greater of the following:

(1) the minimum RVR or VIS for the type of runway/FATO used according to Table 8.1.H; or

(2) the minimum RVR or VIS determined according to the MDH or DH and class of lighting facility according to Table 8.2.H.

~~(1)~~(b) For type A instrument approaches where the missed approach point (MAPt) is within ½ NM of the landing threshold, the approach minima specified for FALS may be used regardless of the length of approach lights available. However, FATO/runway edge lights, threshold lights, end lights and FATO/runway markings are still required;

~~(2) for night operations, ground lights should be available to illuminate the FATO/runway and any obstacles; and~~

~~(3) for single-pilot operations, the minimum RVR is 800 m or the minima in Table 4.2.H, whichever is higher.~~

~~(b) For CAT I operations, the minima specified in Table 4.2.H should apply:~~

~~(1) for night operations, ground light should be available to illuminate the FATO/runway and any obstacles;~~

~~(2) for single-pilot operations, the minimum RVR/VIS should be calculated in accordance with the following additional criteria:~~

(i) an RVR of less than 800 m should not be used except when using a suitable autopilot coupled to an ILS, MLS, GLS or LPV ~~or GLS~~, in which case normal minima apply. ~~; and~~

~~(ii) the DH applied should not be less than 1.25 times the minimum use height for the autopilot.~~

(c) For night operations, ground lights should be available to illuminate the FATO/runway and any obstacles.

(d) The visual aids should comprise standard runway day markings, runway edge lights, threshold lights and runway end lights and approach lights as specified in Table 8.3.H.

(e) For night operations or for any operation where credit for runway and approach lights as defined in Table 8.3.H is required, the lights should be on and serviceable.

(f) For PinS operations, two kinds of procedures can be designed:

(1) PinS approaches with instructions to 'proceed visually' for which the RVR or VIS should be at least the distance between the PinS and the FATO;

(2) PinS approaches with instructions to 'proceed VFR': the RVR or VIS should be equal to the VMC applicable in the airspace class where the PinS is designed and not be lower than 800 m.

Table 8.1.H: Type of runway/FATO v minimum RVR — HELICOPTERS

Type of runway/FATO	**Minimum RVR or VIS (m)**
Precision approach runway, Category I Non-precision approach runway Non-instrument runway	RVR 500 m
Instrument FATO FATO	RVR 500 m RVR/VIS 800 m

Note: A helicopter point-in-space (PinS) with instructions to 'proceed VFR' is not directly related to the nearest FATO or runway, because the flight can continue VFR to any destination after the PinS.

Table 8.1.H does not apply to helicopter PinS approaches with instructions to 'proceed VFR'.

Table 8.2.H: Onshore helicopter instrument approach minima

DH/MDH (ft)	Facilities v RVR/CMV (m)			
	FALS	IALS	BALS	NALS
200	500	600	700	1 000
201–249	550	650	750	1 000
250–299	600 *	700*	800	1 000
300 and above	750*	800	900	1 000

* Minima on 2D approach operations should be no lower than 800 m.

~~**Table 4.1.H: Onshore minima**~~

~~MDH /DH (ft) *~~	~~Approach lighting systems vs RVR/CMV (m) **, ***~~			
	~~FALS~~	~~IALS~~	~~BALS~~	~~NALS~~
~~250–299~~	~~600~~	~~800~~	~~1 000~~	~~1 000~~
~~300–449~~	~~800~~	~~1 000~~	~~1 000~~	~~1 000~~
~~450 and above~~	~~1 000~~	~~1 000~~	~~1 000~~	~~1 000~~

~~*: ‘MDH/DH’ refers to the initial calculation of MDH/DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest 10 ft, which may be done for operational purposes, e.g. conversion to MDA/DA.~~

~~**: The tables are only applicable to conventional approaches with a nominal descent slope of not greater than 4°. Greater descent slopes will usually require that visual glideslope guidance (e.g. precision approach path indicator (PAPI)) is also visible at the MDH.~~

~~**Table 4.2.H: Onshore CAT I minima**~~

~~DH (ft) *~~	~~Approach lighting systems vs RVR/CMV (m) **, ***~~			
	~~FALS~~	~~IALS~~	~~BALS~~	~~NALS~~
~~200~~	~~500~~	~~600~~	~~700~~	~~1 000~~
~~201–250~~	~~550~~	~~650~~	~~750~~	~~1 000~~
~~251–300~~	~~600~~	~~700~~	~~800~~	~~1 000~~
~~301 and above~~	~~750~~	~~800~~	~~900~~	~~1 000~~

~~*: ‘DH’ refers to the initial calculation of DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest 10 ft, which may be done for operational purposes, e.g. conversion to DA.~~

~~**: The table is applicable to standard approaches with a glide slope up to and including 4°.~~

Table 8.3.H: Approach lighting systems

Class of lighting facility	Length, configuration and intensity of approach lights
FALS	CAT I lighting system (HIALS ≥ 720 m) distance coded centre line, barrette centre line
IALS	Simple approach lighting system (HIALS 420–719 m) single source, barrette
BALS	Any other approach lighting system (HIALS, MALS or ALS 210–419 m)
NALS	Any other approach lighting system (HIALS, MALS or ALS < 210 m) or no approach lights

Note:

HIALS: high-intensity approach lighting system

MALS: medium-intensity approach lighting system

Explanatory note to AMC6 NCC.OP.110

This amendment is intended to achieve the specific objective described in Section 2.3.3: Implementation of the new definitions; Minor changes to reflect the operational capabilities of helicopters; Introduction of helicopter PinS approaches to reflect the recent evolution of ICAO Doc 8168 (PANS-OPS), and simplification.

Explanatory note to paragraphs (a) to (f):

The aim is to:

— discuss Type A and Type B approaches and no longer NPA and CAT I, and use the same table for the determination of the RVR/CMV minima in both cases;

— simplify the structure of the paragraphs;

— delete any restrictions to multi-pilot operations. If the helicopter is certified for single-pilot operations under IFR and the single pilot is competent and trained, then the minima should be the same in accordance with performance-based principles. This approach is being implemented to aeroplane operations as per NPA 2018-06(C).

Explanatory note to Tables 4.H and 8.1.H:

See explanatory note to AMC4 NCC.OP.110, Tables 4.H and 8.1.H.

Explanatory note to Table 8.2.H:

This document proposes the same changes to the CAT, NCC, and SPO operating minima. See explanatory note to Table 9.2.H under AMC3 CAT.OP.MPA.110.

Explanatory note to Table 8.3.H:

Table 8.3.H is an editorial change that is proposed to standardise the wording of the helicopter regulatory material following the changes to the aeroplane regulations as per NPA 2018-06(C). This NPA does not propose to change the content.

4. AMC1 NCC.OP.153 is re-numbered and amended as follows:

AMC1 NCC.OP.153(d) Destination aerodromes — instrument approach operations

PBN OPERATIONS

(a) The pilot-in-command should only select an aerodrome as a destination alternate aerodrome if an instrument approach procedure that does not rely on GNSS is available either at that aerodrome or at the destination aerodrome, or for helicopters the GNSS provides sufficient reliability and integrity.

GNSS RELIABILITY AND INTEGRITY — HELICOPTERS

(b) The operator may demonstrate sufficient reliability and integrity of the GNSS if all of the following criteria are met:

(1) SBAS or GBAS are available and used.

(2) The failure of a single receiver or system should not compromise the navigation capability.

(3) The temporary jamming of one frequency should not compromise the navigation capability. The operator should provide a procedure to deal with such cases unless other sensors are available.

(4) The operator should ensure that no space weather event is predicted to disrupt GNSS reliability and integrity at both the destination and the alternate.

(5) The operator should verify the availability of RAIM for all phases of flight based on GNSS, including navigation to the alternate.

(6) The operator's MEL should reflect the elements in paragraphs (b)(1) and (b)(2).

5. The following GM1 NCC.OP.153(d) is inserted:

GM1 NCC.OP.153(d) Selection of aerodromes and operating sites

GNSS RELIABILITY AND INTEGRITY — HELICOPTERS

(a) Redundancy of on-board systems should ensure that no single on-board equipment failure (e.g. antenna, GNSS receiver, FMS, or navigation display failure) results in the loss of the GNSS capability.

(b) Any shadowing of the GNSS signal or jamming of the GNSS frequency from the ground is expected to be of a very short duration and affect a very small area. Additional sensors or functions such as inertial coasting may be used during jamming events.

(c) The availability of GNSS signals can be compromised if space weather events cause 'loss of lock' conditions and more than one satellite signal may be lost on a given GNSS frequency. Until space weather forecasts are available, the operator may use 'nowcasts' as short-term predictions for helicopter flights of short durations.

(d) SBAS also contributes to mitigate space weather effects, both by providing integrity messages and by correcting ionosphere-induced errors.

(e) Even though SBAS should be available and used, RAIM should remain available autonomously. In case of loss of the SBAS, the route and the approach to the destination or alternate should still be flown with an available RAIM function.

(f) When available, GNSS based on more than one constellation and more than one frequency may provide better integrity and redundancy regarding failures in the space segment of GNSS, jamming, and resilience to space weather events.

Explanatory note to AMC1 and GM1 NCC.OP.153(d)

The NPA proposes this new AMC and GM to achieve the specific objective described under Section 2.3.1: Enable onshore IFR operations by providing additional options: Increase the number of available and accessible alternates within the available fuel range.

As it is impossible to mention future standards or to refer to unavailable systems in AMC material, the AMC should be revised in the future to ensure that multi-constellation multi-frequency GNSS is implemented when available, whenever operators rely on GNSS for both the approach to the destination and to the alternate.

The use of SBAS and the redundancy of on-board systems are expected to remain necessary to ensure that no single on-board equipment failure (e.g. antenna, GNSS receiver, FMS, or navigation display failure) can compromise safety.

See explanatory note to AMC1 and GM1 CAT.OP.MPA.192(d).

6. AMC1 NCC.OP.230(b) is amended as follows, using NPA 2018-06(c) as a starting point:

AMC1 NCC.OP.230(b) Commencement and continuation of approach

VISUAL REFERENCES FOR INSTRUMENT APPROACH OPERATIONS

For instrument approach operations Type A and CAT I instrument approach operations Type B, at least one of the visual references specified below should be distinctly visible and identifiable to the pilot at the MDA/H or the DA/H:

(a) elements of the approach lighting system;

(b) the threshold;

(c) the threshold markings;

(d) the threshold lights;

(e) the threshold identification lights;

(f) the visual glideslope indicator;

(g) the TDZ or TDZ markings;

(h) the TDZ lights;

(i) FATO/runway edge lights; ~~or~~

(j) for helicopter point-in-space (PinS) approaches, the identification beacon light;

(k) for helicopter PinS approaches, the identifiable elements of the environment defined on the instrument chart;

(l) for helicopter PinS approaches with instructions to 'proceed VFR', sufficient visual cues to determine that VMC are met; or (m~~j~~) other visual references specified in the operations manual.

Explanatory note to AMC1 NCC.OP.230(b)

This NPA proposes additional changes to AMC1 NCC.OP.230(b) created by NPA 2018-06(C).

The new paragraphs (j) (k) and (l) are introduced to reflect the design of helicopter PinS approaches.

Helicopter PinS approaches with instructions to 'proceed VFR' are cloud-breaking procedures that may be used to continue flight under VFR to an unspecified destination. By design, a visual reference to thresholds or approach lights may never be available at the MAPt, even in good weather. As the flight should only continue under VFR, the pilot should first ensure that VMC are met.

Note: NCC.OP.230 and related AMCs are further amended by NPA 2018-06(C). Section 2.3.1 of this NPA provides quick access to the amendments that are the most relevant to helicopters.

ANNEX VIII

SPECIALISED OPERATIONS

[PART-SPO]

1. The following GM1 SPO.OP.101 is inserted:

GM1 SPO.OP.101 Altimeter check and settings

ALTIMETER-SETTING PROCEDURES

The operator procedures should be aligned with the following paragraphs of ICAO Doc 8168 (PANS-OPS), Volume I:

(a) 3.2 'Pre-flight operational test';

(b) 3.3 'Take-off and climb';

(c) 3.5 'Approach and landing'.

Explanatory note to GM1 SPO.OP.101

The intent is full alignment with Part-NCC. See NPA 2018-06(C).

2. AMC3 SPO.OP.110 is amended as follows:

AMC3 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

GENERAL

(a) The aerodrome operating minima should not be lower than those ~~as~~ specified in ~~SPO.OP.111~~ AMC5 SPO.OP.110 or AMC4 SPO.OP.110(c).

(b) Whenever practical, approaches should be flown as stabilised approaches (SAps). Different procedures may be used for a particular approach to a particular runway.

(c) Whenever practical, non-precision approaches should be flown using the continuous descent final approach (CDFA) technique. Different procedures may be used for a particular approach to a particular runway.

(d) For approaches not flown using the CDFA technique: when calculating the minima in accordance with ~~NCC.OP.111~~ AMC5 SPO.OP.110, the applicable minimum runway visual range (RVR) should be increased by 200 m for Category A and B aeroplanes and by 400 m for Category C and D aeroplanes, provided the resulting RVR/converted meteorological visibility (CMV) value does not exceed 5 000 m. SAp or CDFA should be used as soon as facilities are improved to allow these techniques.

Explanatory note to AMC3 SPO.OP.110

The intent is full alignment with Part-NCC. See NPA 2018-06(C).

3. AMC4 SPO.OP.110 is amended as follows:

AMC4 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

TAKE-OFF OPERATIONS ~~WITH COMPLEX MOTOR-POWERED AIRCRAFT~~

(a) General:

(1) Take-off minima should be expressed as ~~visibility (~~VIS~~)~~ or RVR limits, taking into account all relevant factors for each aerodrome planned to be used and aircraft characteristics and equipment. Where there is a specific need to see and avoid obstacles on departure and/or for a forced landing, additional conditions, e.g. ~~ceiling~~ cloud conditions, should be specified.

(2) The pilot-in-command should not commence take-off unless the weather conditions at the aerodrome of departure are equal to or better than the applicable minima for landing at that aerodrome, unless a weather-permissible take-off alternate aerodrome is available.

(3) When the reported ~~meteorological visibility~~ VIS is below that required for take-off and the RVR is not reported, a take-off should only be commenced if the pilot-in-command can determine that the visibility along the take-off runway/area is equal to or better than the required minimum.

(4) When no reported ~~meteorological visibility~~ VIS or RVR is available, a take-off should only be commenced if the pilot-in-command can determine that the visibility ~~RVR/ VIS~~ along the take-off runway/area is equal to or better than the required minimum.

(b) Visual reference:

(1) The take-off minima should be selected to ensure sufficient guidance to control the aircraft in the event of both a rejected take-off in adverse circumstances and a continued take-off after failure of the critical engine.

(2) For night operations, ground lights should be available to illuminate the runway/final approach and take-off area (FATO) and any obstacles.

TAKE-OFF OPERATIONS WITH HELICOPTERS AND COMPLEX MOTOR-POWERED AEROPLANES

(c) Required RVR~~/~~ or VIS~~visibility~~:

(1) Complex motor-powered aeroplanes~~Aeroplanes~~:

~~(i) For aeroplanes, the take-off minima specified by the operator should be expressed as RVR/VIS values not lower than those specified in Table 1.A.~~

~~(ii) When reported RVR or meteorological visibility is not available, the pilot-in-command should not commence take-off unless he/she can determine that the actual conditions satisfy the applicable take-off minima.~~

(i) For multi-engined aeroplanes with such performance that in the event of a critical engine failure at any point during take-off the aeroplane can either stop or continue the take-off to a height of 1 500 ft above the aerodrome while clearing obstacles by the required margins, the take-off minima specified by the operator should be expressed as RVR or VIS values not lower than those specified in Table 1.A.

(ii) Multi-engined aeroplanes without the performance to comply with the conditions in (c)(1)(i) in the event of a critical engine failure may need to reland immediately and to see and avoid obstacles in the take-off area. Such aeroplanes may be operated to the following take-off minima provided they are able to comply with the applicable obstacle clearance criteria, assuming engine failure at the specified height:

(A) The take-off minima specified by the operator should be based upon the height from which the one-engine-inoperative (OEI) net take-off flight path can be constructed.

(B) The RVR minima used should not be lower than either of the values specified in Table 1.A or Table 2.A.

(iii) For single-engined complex aeroplane operations, the take-off minima specified by the operator should be expressed as RVR/CMV values not lower than those specified in Table 1.A below.

Unless the operator makes use of a risk period, whenever the surface in front of the runway does not allow for a safe forced landing, the RVR/CMV values should not be lower than 800 m. In this case, the proportion of the flight to be considered starts at the lift-off position and ends when the aeroplane is able to turn back and land on the runway in the opposite direction or glide to the next landing site in case of power loss.

(iv) When the RVR or the VIS is not available, the pilot-in-command should not commence take-off unless he or she can determine that the actual conditions satisfy the applicable take-off minima.

(2) Helicopters:

(i) For helicopters having a mass where it is possible to reject the take-off and land on the FATO in case of the critical engine failure being recognised at or before the take-off decision point (TDP), the operator should specify an RVR~~/~~ or VIS as take-off minimum in accordance with Table 1.H.

(ii) For all other cases, the pilot-in-command should operate to take-off minima of 800 m RVR~~/~~ or VIS and remain clear of cloud during the take-off manoeuvre until reaching the performance capabilities of (c)(2)(i).

~~(iii) Table 5 for converting reported meteorological visibility to RVR should not be used for calculating take-off minima.~~

(iii) For point-in-space (PinS) departures to an initial departure fix (IDF), the take-off minima should be selected to ensure sufficient guidance to see and avoid obstacles and return to the heliport if the flight cannot continue visually to the IDF.

Table 1.A: Take-off — aeroplanes (without an approval for low-visibility take-off (LVTO) ~~approval~~)
RVR~~/~~ or VIS

Facilities	**RVR~~/~~ or VIS (m)***
Day only: Nil**	500
Day: at least runway edge lights or runway centre line markings	400

Night: at least runway edge lights or runway centre line lights and runway end lights	

*~~:~~ The reported RVR~~/~~ or VIS value representative of the initial part of the take-off run can be replaced by pilot assessment.

**~~:~~ The pilot is able to continuously identify the take-off surface and maintain directional control.

Table 1.H: Take-off — helicopters (without an approval for LVTO ~~approval~~)

RVR~~/Visibility~~ or VIS

Onshore aerodromes or operating sites with instrument flight rules (IFR) departure procedures	**RVR~~/~~ or VIS (m) ****
No light and no markings (day only)	400 or the rejected take-off distance, whichever is the greater
No markings (night)	800
Runway edge/FATO light and centre line marking	400
Runway edge/FATO light, centre line marking and relevant RVR information	400
Offshore helideck*	
Two-pilot operations	400
Single-pilot operations	500

*~~:~~ The take-off flight path to be free of obstacles.

** On PinS departures to IDF, RVR should be not less than 800 m and ceiling should be not less than 250 ft.

Explanatory note to AMC4 SPO.OP.110

The intent is full alignment with Part-NCC. See NPA 2018-06(C).

Table 1.H is also amended to include helicopter PinS departures.

Paragraph (c) and Table 1.H are extended to SPO operations with non-complex helicopters because the conditions on a FATO, an operating site or an offshore helideck are the same as for operations with complex helicopters.

Former AMC5 is deleted because it duplicates paragraphs (a) and (b) of AMC4.

4. AMC5 and AMC6 SPO.OP.110 are deleted.

~~AMC5 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters~~

~~TAKE-OFF OPERATIONS WITH OTHER-THAN COMPLEX MOTOR-POWERED AIRCRAFT~~

Explanatory note to former AMC5 SPO.OP.110
Former AMC5 is deleted. Its contents are moved to paragraphs (a) and (b) of AMC4 SPO.OP.110.

~~AMC6 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters~~

Explanatory note to former AMC6 SPO.OP.110
Former AMC6 is deleted for consistency with NPA 2018-06(C).

5. The following AMC5 SPO.OP.110 is inserted:

AMC5 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

DETERMINATION OF THE DH/MDH FOR INSTRUMENT APPROACH OPERATIONS — AEROPLANES

(a) The DH to be used for a 3D or a 2D approach operation flown with the CDFA technique should not be lower than the highest of:

(1) the obstacle clearance height (OCH) for the category of aircraft used;

(2) the published approach procedure DH or MDH where applicable;

(3) the system minimum specified in Table 3;

(4) the minimum DH permitted for the runway specified in Table 4.A; or

(5) the minimum DH specified in the AFM or equivalent document, if stated.

(b) The minimum descent height (MDH) for a 2D approach operation flown without the CDFA technique should not be lower than the highest of:

(1) the OCH for the category of aircraft used;

(2) the published approach procedure MDH where applicable;

(3) the system minimum specified in Table 3;

(4) the lowest MDH permitted for the runway specified in Table 4.A; or

(5) the lowest MDH specified in the AFM, if stated.

DETERMINATION OF THE DH/MDH FOR INSTRUMENT APPROACH OPERATIONS — HELICOPTERS

(c) The decision height (DH) or minimum descent height (MDH) should not be lower than the highest of:

(1) the OCH for the category of aircraft used;

(2) the published approach procedure DH or MDH where applicable;

(3) the system minimum specified in Table 3;

(4) the lowest DH or MDH permitted for the runway/FATO specified in Table 4.H; or

(5) the lowest DH or MDH specified in the AFM, if stated.

TABLES

Table 3: System minima — ALL AIRCRAFT

Facility	**Lowest DH/MDH (ft)**
ILS/MLS/GLS	200
GNSS/SBAS (LPV)	200*
GNSS (LNAV)	250
GNSS/Baro-VNAV (LNAV/VNAV)	250
Helicopter point-in-space (PinS) approach	250**
LOC with or without DME	250
SRA (terminating at ½ NM)	250
SRA (terminating at 1 NM)	300
SRA (terminating at 2 NM or more)	350
VOR	300
VOR/DME	250
NDB	350
NDB/DME	300
VDF	350

* For LPV, a DH of 200 ft may be used only if the published FAS datablock sets a vertical alert limit not exceeding 35 m. Otherwise, the DH should not be lower than 250 ft.

** For PinS approaches with instructions to 'proceed VFR', the DH or MDH should be with reference to the ground below the missed approach point (MAPt).

Table 4.A: Runway type minima — AEROPLANES

Runway type	**Lowest DH/MDH (ft)**
PA runway Category I	200 ft
NPA runway	250 ft
Non-instrument runway	Circling minima as shown in Table 1 in NCC.OP.112
Non-instrument FATO/runway for helicopters	250 ft

Table 4.H: Type of runway/FATO v lowest DH/MDH — HELICOPTERS

Type of runway/FATO	Lowest DH/MDH (ft)
Precision approach runway, Category I Non-precision approach runway Non-instrument runway	200 ft
Instrument FATO FATO	200 ft 250 ft

Note: A helicopter point-in-space (PinS) approach with instructions to 'proceed VFR' is not directly related to the nearest FATO or runway, because the flight can continue VFR to any destination after the PinS.

Table 4.H does not apply to helicopter PinS approaches with instructions to 'proceed VFR'.

Explanatory note to AMC5 SPO.OP.110

The intent is full alignment with the Part-NCC wording. See NPA 2018-06(C).

The helicopter tables are also amended to include helicopter PinS departures and aligned with Part-NCC. See explanatory note to AMC4 NCC.OP.110.

6. AMC7 SPO.OP.110 is renumbered and amended as follows:

~~AMC7~~ AMC6 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

DETERMINATION OF RVR/CMV~~/VIS MINIMA FOR NPA, APV, CAT I~~ FOR INSTRUMENT APPROACH OPERATIONS — AEROPLANES

~~(a) The minimum RVR/CMV/VIS should be the highest of the values specified in Table 3 and Table 4.A but not greater than the maximum values specified in Table 4.A, where applicable.~~

~~(b) The values in Table 3 should be derived from the formula below:~~

~~required RVR/VIS (m) = [(DH/MDH (ft) x 0.3048) / tanα] – length of approach lights (m);~~

~~where α is the calculation angle, being a default value of 3.00° increasing in steps of 0.10° for each line in Table 3 up to 3.77° and then remaining constant.~~

~~(c) If the approach is flown with a level flight segment at or above MDA/H, 200 m should be added for Category A and B aeroplanes and 400 m for Category C and D aeroplanes to the minimum RVR/CMV/VIS value resulting from the application of Table 3 and Table 4.A.~~

~~(d) An RVR of less than 750 m as indicated in Table 3 may be used:~~

~~(1) for CAT I operations to runways with full approach lighting system (FALS), runway touchdown zone lights (RTZL) and runway centreline lights (RCLL);~~

~~(2) for CAT I operations to runways without RTZL and RCLL when using an approved head-up guidance landing system (HUDLS), or equivalent approved system, or when conducting a~~

~~coupled approach or flight-director-flown approach to a DH. The ILS should not be published as a restricted facility; and~~

~~(3) for APV operations to runways with FALS, RTZL and RCLL when using an approved head-up display (HUD).~~

~~(e) Lower values than those specified in Table 3 may be used for HUDLS and auto-land operations if approved in accordance with Annex V (Part SPA), Subpart E.~~

~~(f) The visual aids should comprise standard runway day markings and approach and runway lights as specified in Table 2. The competent authority may approve that RVR values relevant to a basic approach lighting system (BALS) are used on runways where the approach lights are restricted in length below 210 m due to terrain or water, but where at least one cross-bar is available.~~

~~(g) For night operations or for any operation where credit for runway and approach lights is required, the lights should be on and serviceable, except as provided for in Table 6 of AMC6 SPO.OP.110.~~

~~(h) For single-pilot operations, the minimum RVR/VIS should be calculated in accordance with the following additional criteria:~~

~~(1) an RVR of less than 800 m as indicated in Table 3 may be used for CAT I approaches provided any of the following is used at least down to the applicable DH:~~

~~(i) a suitable autopilot, coupled to an ILS, MLS or GLS that is not published as restricted; or~~

~~(ii) an approved HUDLS, including, where appropriate, enhanced vision system (EVS), or equivalent approved system;~~

~~(2) where RTZL and/or RCLL are not available, the minimum RVR/CMV should not be less than 600 m; and~~

~~(3) an RVR of less than 800 m as indicated in Table 3 may be used for APV operations to runways with FALS, RTZL and RCLL when using an approved HUDLS, or equivalent approved system, or when conducting a coupled approach to a DH equal to or greater than 250 ft.~~

~~Table 2: Approach lighting systems~~

~~Class of lighting facility~~	**~~Length, configuration and intensity of approach lights~~**
~~FALS~~	~~CAT I lighting system (HIALS ≥ 720 m) distance coded centreline, Barrette centreline~~
~~IALS~~	~~Simple approach lighting system (HIALS 420 – 719 m) single source, Barrette~~
~~BALS~~	~~Any other approach lighting system (HIALS, MIALS or ALS 210 – 419 m)~~
~~NALS~~	~~Any other approach lighting system (HIALS, MIALS or ALS < 210 m) or no approach lights~~

~~*Note:* HIALS: high intensity approach lighting system;~~
~~MIALS: medium intensity approach lighting system;~~
~~ALS: approach lighting system.~~

~~Table 3: RVR/CMV vs. DH/MDH~~

~~DH or MDH~~			**~~Class of lighting facility~~**			
			~~FALS~~	**~~IALS~~**	**~~BALS~~**	**~~NALS~~**
			~~See (d), (e), (h) above for RVR < 750/800 m~~			
~~Ft~~			**~~RVR/CMV (m)~~**			
~~200~~	~~-~~	~~210~~	~~550~~	~~750~~	~~1 000~~	~~1 200~~
~~211~~	~~-~~	~~220~~	~~550~~	~~800~~	~~1 000~~	~~1 200~~
~~221~~	~~-~~	~~230~~	~~550~~	~~800~~	~~1 000~~	~~1 200~~
~~231~~	~~-~~	~~240~~	~~550~~	~~800~~	~~1 000~~	~~1 200~~
~~241~~	~~-~~	~~250~~	~~550~~	~~800~~	~~1 000~~	~~1 300~~
~~251~~	~~-~~	~~260~~	~~600~~	~~800~~	~~1 100~~	~~1 300~~
~~261~~	~~-~~	~~280~~	~~600~~	~~900~~	~~1 100~~	~~1 300~~
~~281~~	~~-~~	~~300~~	~~650~~	~~900~~	~~1 200~~	~~1 400~~
~~301~~	~~-~~	~~320~~	~~700~~	~~1 000~~	~~1 200~~	~~1 400~~
~~321~~	~~-~~	~~340~~	~~800~~	~~1 100~~	~~1 300~~	~~1 500~~
~~341~~	~~-~~	~~360~~	~~900~~	~~1 200~~	~~1 400~~	~~1 600~~
~~361~~	~~-~~	~~380~~	~~1 000~~	~~1 300~~	~~1 500~~	~~1 700~~
~~381~~	~~-~~	~~400~~	~~1 100~~	~~1 400~~	~~1 600~~	~~1 800~~
~~401~~	~~-~~	~~420~~	~~1 200~~	~~1 500~~	~~1 700~~	~~1 900~~
~~421~~	~~-~~	~~440~~	~~1 300~~	~~1 600~~	~~1 800~~	~~2 000~~
~~441~~	~~-~~	~~460~~	~~1 400~~	~~1 700~~	~~1 900~~	~~2 100~~
~~461~~	~~-~~	~~480~~	~~1 500~~	~~1 800~~	~~2 000~~	~~2 200~~
~~481~~		~~500~~	~~1 500~~	~~1 800~~	~~2 100~~	~~2 300~~
~~501~~	~~-~~	~~520~~	~~1 600~~	~~1 900~~	~~2 100~~	~~2 400~~
~~521~~	~~-~~	~~540~~	~~1 700~~	~~2 000~~	~~2 200~~	~~2 400~~

~~**DH or MDH**~~			~~**Class of lighting facility**~~			
			~~**FALS**~~	~~**IALS**~~	~~**BALS**~~	~~**NALS**~~
			~~See (d), (e), (h) above for RVR < 750/800 m~~			
~~**Ft**~~			~~**RVR/CMV (m)**~~			
~~541~~	~~-~~	~~560~~	~~1 800~~	~~2 100~~	~~2 300~~	~~2 500~~
~~561~~	~~-~~	~~580~~	~~1 900~~	~~2 200~~	~~2 400~~	~~2 600~~
~~581~~	~~-~~	~~600~~	~~2 000~~	~~2 300~~	~~2 500~~	~~2 700~~
~~601~~	~~-~~	~~620~~	~~2 100~~	~~2 400~~	~~2 600~~	~~2 800~~
~~621~~	~~-~~	~~640~~	~~2 200~~	~~2 500~~	~~2 700~~	~~2 900~~
~~641~~	~~-~~	~~660~~	~~2 300~~	~~2 600~~	~~2 800~~	~~3 000~~
~~661~~	~~-~~	~~680~~	~~2 400~~	~~2 700~~	~~2 900~~	~~3 100~~
~~681~~	~~-~~	~~700~~	~~2 500~~	~~2 800~~	~~3 000~~	~~3 200~~
~~701~~	~~-~~	~~720~~	~~2 600~~	~~2 900~~	~~3 100~~	~~3 300~~
~~721~~	~~-~~	~~740~~	~~2 700~~	~~3 000~~	~~3 200~~	~~3 400~~
~~741~~	~~-~~	~~760~~	~~2 700~~	~~3 000~~	~~3 300~~	~~3 500~~
~~761~~	~~-~~	~~800~~	~~2 900~~	~~3 200~~	~~3 400~~	~~3 600~~
~~801~~	~~-~~	~~850~~	~~3 100~~	~~3 400~~	~~3 600~~	~~3 800~~
~~851~~	~~-~~	~~900~~	~~3 300~~	~~3 600~~	~~3 800~~	~~4 000~~
~~901~~	~~-~~	~~950~~	~~3 600~~	~~3 900~~	~~4 100~~	~~4 300~~
~~951~~	~~-~~	~~1 000~~	~~3 800~~	~~4 100~~	~~4 300~~	~~4 500~~
~~1 001~~	~~-~~	~~1 100~~	~~4 100~~	~~4 400~~	~~4 600~~	~~4 900~~
~~1 101~~	~~-~~	~~1 200~~	~~4 600~~	~~4 900~~	~~5 000~~	~~5 000~~
~~1 201 and above~~			~~5 000~~	~~5 000~~	~~5 000~~	~~5 000~~

~~**Table 4.A: CAT I, APV, NPA – aeroplanes**~~

~~**Minimum and maximum applicable RVR/CMV (lower and upper cut-off limits)**~~

~~**Facility/conditions**~~	~~**RVR/CMV (m)**~~	~~**Aeroplane category**~~			
		~~**A**~~	~~**B**~~	~~**C**~~	~~**D**~~
~~ILS, MLS, GLS, PAR, GNSS/SBAS, GNSS/VNAV~~	~~Min~~	~~According to Table 3~~			
	~~Max~~	~~1 500~~	~~1 500~~	~~2 400~~	~~2 400~~
~~NDB, NDB/DME, VOR, VOR/DME, LOC, LOC/DME, VDF, SRA, GNSS/LNAV with a procedure that fulfils the criteria in AMC4 NCC.OP.110 (a)(2).~~	~~Min~~	~~750~~	~~750~~	~~750~~	~~750~~
	~~Max~~	~~1 500~~	~~1 500~~	~~2 400~~	~~2 400~~
~~For NDB, NDB/DME, VOR, VOR/DME, LOC, LOC/DME, VDF, SRA, GNSS/LNAV:~~ ~~— not fulfilling the criteria in AMC4 NCC.OP.110 (a)(2)., or~~ ~~— with a DH or MDH ≥ 1 200 ft~~	~~Min~~	~~1 000~~	~~1 000~~	~~1 200~~	~~1 200~~
	~~Max~~	~~According to Table 3 if flown using the CDFA technique, otherwise an add-on of 200/400 m applies to the values in Table 3 but not to result in a value exceeding 5 000 m.~~			

(a) The RVR or VIS for straight-in instrument approach operations should not be less than the greatest of the following:

(1) the minimum RVR or VIS for the type of runway used according to Table 4.A; or

(2) the minimum RVR or VIS determined according to the MDH or DH and class of lighting facility according to Table 5.A; or

(3) the minimum RVR or VIS according to the visual and non-visual aids and on-board equipment used according to Table 6.A.

(b) For Category A and B aeroplanes, if the RVR or VIS determined in accordance with (a) is greater than 1 500 m, then 1 500 m should be used.

(c) If the approach is flown with a level flight segment at or above the MDA/H, 200 m should be added to the calculated RVR for Category A and B aeroplanes and 400 m for Category C and D aeroplanes.

(d) The visual aids should comprise standard runway day markings, runway edge lights, threshold lights, runway end lights and approach lights as defined in Table 5.A.

(e) For night operations or for any operation where credit for visual aids is required, the lights should be on and serviceable except as provided for in Table 10.

(f) Where any visual or non-visual aid specified for the approach and assumed to be available in the determination of operating minima is unavailable, revised operating minima will need to be determined.

Table 4.A: Type of runway v minimum RVR or VIS

Type of runway	**Minimum RVR or VIS (m)**
Precision approach runway, Category I	550 m
Non-precision approach runway	750 m
Non-instrument runway	According to Table 1 in NCC.OP.112

Table 5.A: RVR/CMV v DH/MDH

DH or MDH (ft)			**Class of lighting facility**			
			FALS	**IALS**	**BALS**	**NALS**
			RVR/CMV (m)			
200	—	210	550	750	1 000	1 200
211	—	240	550	800	1 000	1 200
241	—	250	550	800	1 000	1 300
251	—	260	600	800	1 100	1 300
261	—	280	600	900	1 100	1 300
281	—	300	650	900	1 200	1 400
301	—	320	700	1 000	1 200	1 400
321	—	340	800	1 100	1 300	1 500
341	—	360	900	1 200	1 400	1 600
361	—	380	1 000	1 300	1 500	1 700
381	—	400	1 100	1 400	1 600	1 800
401	—	420	1 200	1 500	1 700	1 900
421	—	440	1 300	1 600	1 800	2 000
441	—	460	1 400	1 700	1 900	2 100
461	—	480	1 500	1 800	2 000	2 200
481	—	500	1 500	1 800	2 100	2 300
501	—	520	1 600	1 900	2 100	2 400
521	—	540	1 700	2 000	2 200	2 400
541	—	560	1 800	2 100	2 300	2 400
561	—	580	1 900	2 200	2 400	2 400

DH or MDH (ft)			Class of lighting facility			
			FALS	IALS	BALS	NALS
			RVR/CMV (m)			
581	—	600	2 000	2 300	2 400	2 400
601	—	620	2 100	2 400	2 400	2 400
621	—	640	2 200	2 400	2 400	2 400
641	—	660	2 300	2 400	2 400	2 400
661	and above		2 400	2 400	2 400	2 400

Table 6.A: Visual and non-visual aids and/or on-board equipment v minimum RVR

Type of approach	**Facilities**	**Lowest RVR (m)**	
		Multi-pilot operations	**Single-pilot operations**
3D operations	RTZL and RCLL	*[no limitation]*	
	Without RTZL and RCLL but using HUDLS or equivalent system; coupled autopilot or flight director to the DH	*[no limitation]*	600
	No RTZL and RCLL, not using HUDLS or equivalent system or autopilot to the DH	750	800
2D operations	Final approach track offset < 15° for Category A and B aeroplanes or < 5° for Category C and D aeroplanes	750	800
	Final approach track offset ≥ 15° for Category A and B aeroplanes	1 000	1 000
	Final approach track offset ≥ 5° for Category C and D aeroplanes	1 200	1 200

Table 7: Approach lighting systems

Class of lighting facility	**Length, configuration and intensity of approach lights**
FALS	CAT I lighting system (HIALS ≥ 720 m) distance coded centre line, barrette centre line
IALS	Simple approach lighting system (HIALS 420–719 m) single source, barrette
BALS	Any other approach lighting system (e.g. HIALS, MALS or ALS 210–419 m)
NALS	Any other approach lighting system (e.g. HIALS, MALS or ALS < 210 m) or no approach lights

7. AMC8 SPO.OP.110 is re-numbered and amended as follows:

AMC7 ~~AMC8~~ SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

DETERMINATION OF THE RVR/CMV/VIS MINIMA FOR ~~NPA~~ TYPE A INSTRUMENT APPROACH AND TYPE B CAT I INSTRUMENT APPROACH — HELICOPTERS

~~(a) For non-precision approach (NPA) operations, the minima specified in Table 4.1.H should apply:~~

(a) The RVR/CMV should be not less than the greater of the following:

(1) the minimum RVR or VIS for the type of runway/FATO used according to Table 8.1.H; or

(2) the minimum RVR or VIS determined according to the MDH or DH and class of lighting facility according to Table 8.2.H.

~~(1)~~(b) For Type A instrument approaches where the missed approach point (MAPt) is within ½ NM of the landing threshold, the approach minima specified for FALS may be used regardless of the length of approach lights available. However, FATO/runway edge lights, threshold lights, end lights and FATO/runway markings are still required;

~~(2) for night operations, ground lights should be available to illuminate the FATO/runway and any obstacles; and~~

~~(3) for single-pilot operations, the minimum RVR is 800 m or the minima in Table 4.2.H, whichever is higher.~~

~~(b) For CAT I operations, the minima specified in Table 4.2.H should apply:~~

~~(1) for night operations, ground light should be available to illuminate the FATO/runway and any obstacles;~~

~~(2) for single-pilot operations of type B approaches, the minimum RVR/VIS should be calculated in accordance with the following additional criteria:~~

(1~~i~~) an RVR of less than 800 m should not be used except when using a suitable autopilot coupled to an ILS, MLS, GLS or LPV ~~or GLS~~, in which case normal minima apply. ~~; and~~

~~(ii) the DH applied should not be less than 1.25 times the minimum use height for the autopilot.~~

(c) For night operations, ground lights should be available to illuminate the FATO/runway and any obstacles.

(d) The visual aids should comprise standard runway day markings, runway edge lights, threshold lights and runway end lights and approach lights as specified in Table 8.3.H.

(e) For night operations or for any operation where credit for runway and approach lights as defined in Table 8.3H is required, the lights should be on and serviceable.

(f) For PinS operations, two kinds of procedures can be designed:

(1) PinS approaches with instructions to 'proceed visually' for which the RVR or VIS should be at least the distance between the PinS and the FATO;

(2) PinS approaches with instructions to 'proceed VFR': the RVR or VIS should be equal to the VMC applicable in the airspace class where the PinS is designed and not be lower than 800 m.

Table 8.1.H: Type of runway/FATO v minimum RVR — HELICOPTERS

Type of runway/FATO	**Minimum RVR or VIS (m)**
Precision approach runway, Category I Non-precision approach runway Non-instrument runway	RVR 500 m
Instrument FATO FATO	RVR 500 m RVR/VIS 800 m

Note: A helicopter point-in-space (PinS) with instructions to 'proceed VFR' is not directly related to the nearest FATO or runway, because the flight can continue VFR to any destination after the PinS.

Table 8.1.H does not apply to helicopter PinS approaches with instructions to 'proceed VFR'.

Table 8.2.H: Onshore helicopter instrument approach minima

DH/MDH (ft)	**Facilities v RVR/CMV (m)**			
	FALS	**IALS**	**BALS**	**NALS**
200	500	600	700	1 000
201–249	550	650	750	1 000
250–299	600*	700*	800	1 000
300 and above	750*	800	900	1 000

* Minima on 2D approach operations should be no lower than 800 m.

~~**Table 4.1.H: Onshore minima**~~

~~MDH /DH (ft) *~~	~~Approach lighting systems vs RVR/CMV (m) **, ***~~			
	~~FALS~~	~~IALS~~	~~BALS~~	~~NALS~~
~~250–299~~	~~600~~	~~800~~	~~1 000~~	~~1 000~~
~~300–449~~	~~800~~	~~1 000~~	~~1 000~~	~~1 000~~
~~450 and above~~	~~1 000~~	~~1 000~~	~~1 000~~	~~1 000~~

~~*: ‘MDH/DH’ refers to the initial calculation of MDH/DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest 10 ft, which may be done for operational purposes, e.g. conversion to MDA/DA.~~

~~**: The tables are only applicable to conventional approaches with a nominal descent slope of not greater than 4°. Greater descent slopes will usually require that visual glideslope guidance (e.g. precision approach path indicator (PAPI)) is also visible at the MDH.~~

~~Table 4.2.H: Onshore CAT I minima~~

~~DH (ft) *~~	~~Approach lighting systems vs RVR/CMV (m) **, ***~~			
	~~FALS~~	~~IALS~~	~~BALS~~	~~NALS~~
~~200~~	~~500~~	~~600~~	~~700~~	~~1 000~~
~~201–250~~	~~550~~	~~650~~	~~750~~	~~1 000~~
~~251–300~~	~~600~~	~~700~~	~~800~~	~~1 000~~
~~301 and above~~	~~750~~	~~800~~	~~900~~	~~1 000~~

~~*: ‘DH’ refers to the initial calculation of DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest 10 ft, which may be done for operational purposes, e.g. conversion to DA.~~

~~**: The table is applicable to standard approaches with a glide slope up to and including 4°.~~

~~IALS comprise FATO/runway markings, 420 – 719 m of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~BALS comprise FATO/runway markings, < 420 m of HI/MI approach lights, any length of LI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~NALS comprise FATO/runway markings, FATO/runway edge lights, threshold lights, FATO/runway end lights or no lights at all.~~

Table 8.3.H: Approach lighting systems

Class of lighting facility	**Length, configuration and intensity of approach lights**
FALS	CAT I lighting system (HIALS ≥ 720 m) distance coded centre line, barrette centre line
IALS	Simple approach lighting system (HIALS 420–719 m) single source, barrette
BALS	Any other approach lighting system (HIALS, MALS or ALS 210–419 m)
NALS	Any other approach lighting system (HIALS, MALS or ALS < 210 m) or no approach lights

Note:

HIALS: high-intensity approach lighting system

MALS: medium-intensity approach lighting system

Explanatory note to AMC7 SPO.OP.110

See AMC6 NCC.OP.110.

8. AMC9 SPO.OP.110 is renumbered and amended as follows:

AMC8 ~~AMC9~~ SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

CONVERSION OF REPORTED METEOROLOGICAL VISIBILITY (VIS) TO RVR/CMV

(a) A conversion from ~~meteorological visibility~~ VIS to RVR/CMV should not be used:

(1) when the reported RVR is available;

(2) for calculating take-off minima; and

(3) for ~~other RVR minima less than 800 m~~ the purpose of continuation approach in low-visibility operations.

(b) If the RVR is reported as being above the maximum value assessed by the aerodrome operator, e.g. ‘RVR more than 1 500 m’, it should not be considered as a reported value for (a)(1).

(c) When converting ~~meteorological visibility~~ VIS to RVR in circumstances other than those in (a), the conversion factors specified in Table ~~5~~9 should be used.

Table ~~5~~9: Conversion of reported ~~meteorological visibility~~ VIS to RVR/CMV

Light elements in operation	RVR/CMV = reported VIS ~~meteorological visibility x~~	
	Day	Night
HI approach and runway lights	1.5	2.0
Any type of light installation other than above	1.0	1.5
No lights	1.0	not applicable

Explanatory note to AMC8 SPO.OP.110

The proposed amendments are for consistency with NPA 2018-06(C).

9. AMC10 SPO.OP.110 is renumbered and amended as follows:

AMC9 ~~AM10~~ SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

EFFECT ON LANDING MINIMA OF TEMPORARILY FAILED OR DOWNGRADED GROUND EQUIPMENT — COMPLEX MOTOR-POWERED AIRCRAFT

(a) General

These instructions are intended for both preflight and in-flight use. It is, however, not expected that the pilot-in-command would consult such instructions after passing 1 000 ft above the aerodrome. If failures of ground aids are announced at such a late stage, the approach could be continued at the pilot-in-command's discretion. If failures are announced before such a late stage in the approach, their effect on the approach should be considered as described in Table ~~6~~10 and, if considered necessary, the approach should be abandoned.

(b) Conditions applicable to Table ~~6~~10:

(1) multiple failures of runway/FATO lights other than indicated in Table ~~6~~10 should not be acceptable;

(2) deficiencies of approach and runway/FATO lights are treated separately; and

(3) failures other than ILS or ~~,~~ MLS affect the RVR only and not the DH.

Table ~~6~~ 10: Failed or downgraded equipment — effect on landing minima

Failed or downgraded equipment	Effect on landing minima	
	~~CAT I~~ Type B	**~~APV, NPA~~ Type A**
ILS/MLS standby transmitter	No effect	
Outer marker	No effect if ~~replaced by height check at 1 000 ft~~ the required height or glide path can be checked using other means, e.g. DME fix	APV — not applicable NPA with FAF: no effect unless used as FAF If the FAF cannot be identified (e.g. no method available for timing of descent), non-precision operations cannot be conducted
Middle marker	No effect	No effect unless used as MAPt
RVR assessment systems	No effect	
Approach lights	Minima as for NALS	
Approach lights except the last 210 m	Minima as for BALS	
Approach lights except the last 420 m	Minima as for IALS	
Standby power for approach lights	No effect	
Edge lights, threshold lights and runway end lights	Day — no effect Night — not allowed	
Centre line lights	No effect if flight director (F/D), HUDLS or auto-land; otherwise RVR of 750 m	No effect
Centre line lights spacing increased to 30 m	No effect	
~~Touchdown zone~~ TDZ lights	No effect if F/D, HUDLS or auto-land; otherwise RVR 750 m	No effect

Failed or downgraded equipment	**Effect on landing minima**	
	~~CAT I~~ Type B	**~~APV, NPA~~ Type A**
Taxiway lighting system	No effect	

Explanatory note to AMC9 SPO.OP.110

The proposed amendments are for consistency with NPA 2018-06(C).

10. AMC11 SPO.OP.110 is renumbered and amended as follows:

AMC10 ~~AMC11~~ SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

EFFECT ON LANDING MINIMA OF TEMPORARILY FAILED OR DOWNGRADED GROUND EQUIPMENT — OTHER-THAN COMPLEX MOTOR-POWERED AIRCRAFT

[…]

Explanatory note to AMC10 SPO.OP.110

The AMC is renumbered with no other changes.

11. GM1 SPO.OP.110 is amended as follows:

GM1 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

AIRCRAFT CATEGORIES

[…]

Table ~~1~~11: Aircraft categories corresponding to V_{AT} values

[…]

Explanatory note to GM1 SPO.OP.110

The table in the AMC is renumbered with no other changes.

12. The following GM5 SPO.OP.110 is inserted:

GM5 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

APPROACH LIGHTING SYSTEMS — ICAO, FAA

The following table provides a comparison of the ICAO and the FAA specifications.

Table 12: Approach lighting systems — ICAO and FAA specifications

Class of lighting facility	Length, configuration and intensity of approach lights
FALS	ICAO: CAT I lighting system (HIALS ≥ 720 m) distance coded centre line, barrette centre line FAA: ALSF1, ALSF2, SSALR, MALSR, high- or medium-intensity and/or flashing lights, 720 m or more
IALS	ICAO: simple approach lighting system (HIALS 420–719 m) single source, barrette FAA: MALSF, MALS, SALS/SALSF, SSALF, SSALS, high- or medium-intensity and/or flashing lights, 420–719 m
BALS	Any other approach lighting system (e.g. HIALS, MALS or ALS 210–419 m) FAA: ODALS, high- or medium-intensity or flashing lights 210–419 m
NALS	Any other approach lighting system (e.g. HIALS, MALS or ALS <210 m) or no approach lights

13. The following GM6 SPO.OP.110 is inserted:

GM6 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

SBAS OPERATIONS

(a) SBAS CAT I operations with a DH of 200 ft depend on an SBAS approved for operations down to a DH of 200 ft.

(b) The following systems are in operational use or in a planning phase:

(1) European geostationary navigation overlay service (EGNOS), operational in Europe;

(2) wide area augmentation system (WAAS), operational in the USA;

(3) multi-functional satellite augmentation system (MSAS), operational in Japan;

(4) system of differential correction and monitoring (SDCM), planned by Russia;

(5) GPS-aided geo-augmented navigation (GAGAN) system, planned by India; and

(6) satellite navigation augmentation system (SNAS), planned by China.

14. The following GM7 SPO.OP.110 is inserted:

GM7 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

MEANS TO DETEMINE THE REQUIRED RVR BASED ON DH AND LIGHTING FACILITIES

The values in Table 5.A are derived from the formula below:

required RVR or VIS (m) = [(DH/MDH (ft) × 0.3048)/tanα] – length of approach lights (m)

where α is the calculation angle, being a default value of 3.00° increasing in steps of 0.10° for each line in Table 5.A up to 3.77° and then remaining constant.

15. The following GM8 SPO.OP.110 is inserted:

GM8 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

USE OF DECISION HEIGHT (DH) FOR NON-PRECISION APPROACHES (NPAs) FLOWN USING CONTINUOUS DESCENT FINAL APPROACH (CDFA)

The safety of the use of the MDH as DH in CDFA operations has been verified by at least two independent analyses concluding that a CDFA using MDH as DH without any add-on is safer than the traditional step-down and level flight NPA operation. A comparison was made between the safety level of using MDH as DH without an add-on with the well-established safety level resulting from the ILS collision risk model (CRM). The NPA used was the most demanding, i.e. most tightly designed NPA, which offers the least additional margins. It should be noted that the design limits of the ILS approach design, e.g. the maximum glide path (GP) angle of 3.5 degrees, must be observed for the CDFA in order to keep the validity of the comparison.

There is a wealth of operational experience in Europe confirming the above-mentioned analytical assessments. It cannot be expected that each operator is able to conduct similar safety assessments and this is not necessary. The safety assessments already performed take into account the most demanding circumstances at hand, like the most tightly designed NPA procedures and other 'worst-case scenarios'. The assessments naturally focus on cases where the controlling obstacle is located in the missed approach area.

However, it is necessary for operators to assess whether their cockpit procedures and training are adequate to ensure minimal height loss in case of a go-around manoeuvre. Suitable topics for the safety assessment required by each operator include:

— understanding of the CDFA concept including use of the MDA/H as DA/H;

— cockpit procedures that ensure flight on speed, on path, and with proper configuration and energy management;

— cockpit procedures that ensure gradual decision-making; and

— identification of cases where an increase of the DA/H may be necessary because of non-standard circumstances, etc.

16. The following GM9 SPO.OP.110 is inserted:

GM9 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters

INCREMENTS SPECIFIED BY THE COMPETENT AUTHORITY

Additional increments to the published minima may be specified by the competent authority in order to take into account certain operations, such as downwind approaches and single-pilot operations.

17. The following GM10 SPO.OP.110 is inserted:

GM10 SPO.OP.110 Aerodrome operating minima —aeroplanes and helicopters

USE OF COMMERCIALLY AVAILABLE INFORMATION

When an operator uses commercially available information for Part C of the operations manual, the operator remains responsible for ensuring that the information used is accurate, is suitable for its operation, and that aerodrome operating minima are calculated in accordance with the method approved by the competent authority.

The operator should apply the procedures in ORO.GEN.205 'Contracted activities'.

18. The following GM1 SPO.OP.110(b)(5) is inserted:

GM1 SPO.OP.110(b)(5) Aerodrome operating minima

VISUAL AND NON-VISUAL AIDS AND INFRASTRUCTURE

'Visual and non-visual aids and infrastructure' refers to all equipment and facilities required for the procedure to be used for the intended instrument approach operation. This includes but is not limited to lights, markings, ground- or space-based radio aids, etc.

Explanatory note to GM5, GM6, GM7, GM8, GM9, GM10 SPO.OP.110 and GM1 SPO.OP.110(b)(5)

The above GM were developed for Part-NCC under NPA 2018-06(C).

This NPA proposes to extend them to Part-SPO.

19. GM1 SPO.OP.112 is amended as follows:

GM1 SPO.OP.112 Aerodrome operating minima — circling operations with aeroplanes

SUPPLEMENTAL INFORMATION

(a) The purpose of this guidance material is to provide operators with supplemental information regarding the application of aerodrome operating minima in relation to circling approaches.

(b) Conduct of flight — general:

(1) the MDH and ~~obstacle clearance height (~~OCH~~)~~ included in the procedure are referenced to aerodrome elevation;

(2) the MDA is referenced to mean sea level;

(3) for these procedures, the applicable visibility is the ~~meteorological visibility~~ VIS; and

(4) operators should provide tabular guidance of the relationship between height above threshold and the in-flight visibility required to obtain and sustain visual contact during the circling manoeuvre.

(c) Instrument approach followed by visual manoeuvring (circling) without prescribed tracks:

(1) When the aeroplane is on the initial instrument approach, before visual reference is stabilised, but not below the MDA/H, ~~—~~ the aeroplane should follow the corresponding instrument approach procedure (IAP) until the appropriate instrument MAPt is reached.

(2) At the beginning of the level flight phase at or above the MDA/H, the instrument approach track ~~determined by the radio navigation aids, RNAV, RNP, ILS, MLS or GLS~~ should be maintained until the pilot:

(i) estimates that, in all probability, visual contact with the runway of intended landing or the runway environment will be maintained during the entire circling procedure;

(ii) estimates that the aeroplane is within the circling area before commencing circling; and

(iii) is able to determine the aeroplane's position in relation to the runway of intended landing with the aid of the appropriate ~~external~~ visual references.

(3) When reaching the published instrument MAPt and the pilot cannot establish the conditions ~~stipulated~~ in (c)(2) ~~are unable to be established by the pilot~~, a missed approach should be carried out in accordance with that ~~instrument approach procedure~~ IAP.

(4) After the aeroplane has left the track of the initial instrument approach, the flight phase outbound from the runway should be limited to an appropriate distance, which is required to align the aeroplane onto the final approach. Such manoeuvres should be conducted to enable the aeroplane to:

(i) ~~to~~ attain a controlled and stable descent path to the intended landing runway; and

(ii) ~~to~~ remain within the circling area and in ~~a~~ such a way that visual contact with the runway of intended landing or runway environment is maintained at all times.

(5) Flight manoeuvres should be carried out at an altitude/height that is not less than the circling MDA/H.

(6) Descent below the MDA/H should not be initiated until the threshold of the runway to be used has been appropriately identified. The aeroplane should be in a position to continue with a normal rate of descent and land within the ~~touchdown zone~~ TDZ.

(d) Instrument approach followed by a visual manoeuvring (circling) with prescribed track.

(1) The aeroplane should remain on the initial ~~instrument approach procedure~~ IAP until one of the following is reached:

(i) the prescribed divergence point to commence circling on the prescribed track; or

(ii) the MAPt.

(2) The aeroplane should be established on the instrument approach track ~~determined by the radio navigation aids, RNAV, RNP, ILS, MLS or GLS~~ in level flight at or above the MDA/H at or by the circling manoeuvre divergence point.

[...]

(8) Unless otherwise specified in the procedure, final descent should not be commenced from the MDA/H until the threshold of the intended landing runway has been identified and the aeroplane is in a position to continue with a normal rate of descent to land within the ~~touchdown zone~~TDZ.

(e) Missed approach

(1) Missed approach during the instrument procedure prior to circling:

(i) if the missed approach procedure is required to be flown when the aeroplane is positioned on the instrument approach track ~~defined by radio navigation aids, RNAV, RNP, ILS, MLS or GLS~~, and before commencing the circling manoeuvre, the published missed approach for the instrument approach should be followed; or

(ii) if the ~~instrument approach procedure~~ IAP is carried out with the aid of an ILS, an MLS or a stabilised approach (SAp), the MAPt associated with an ILS or an MLS procedure without glide path (GP-out procedure) or the SAp, where applicable, should be used.

[…]

Explanatory note to GM1 SPO.OP.112
The amendment impacts on aeroplanes only and aligns the wording with NPA 2018-06(C).

20. The following GM5 SPO.OP.110 is inserted:

AMC1 SPO.OP.115(c) Departure and approach procedures — aeroplanes and helicopters

APPROACH FLIGHT TECHNIQUE — AEROPLANES

(a) All approach operations should be flown as stabilised approach operations.

(b) The CDFA technique should be used for non-precision approach (NPA) procedures.

Explanatory note to AMC1 SPO.OP.115(c)

The proposed new AMC impacts on aeroplanes only and aligns the wording with Part-NCC.

See NPA 2018-06(C).

21. AMC1 SPO.OP.152 is amended as follows:

AMC1 SPO.OP.152 Destination aerodromes — instrument approach operations

PBN OPERATIONS

(a) The pilot-in-command should only select an aerodrome as a destination alternate aerodrome if an instrument approach procedure that does not rely on GNSS is available either at that aerodrome or at the destination aerodrome, or for helicopters, the GNSS provides sufficient reliability and integrity.

GNSS RELIABILITY AND INTEGRITY — HELICOPTERS

(b) The operator may demonstrate sufficient reliability and integrity of the GNSS if all of the following criteria are met:

(1) SBAS or GBAS are available and used.

(2) The failure of a single receiver or system should not compromise the navigation capability.

(3) The temporary jamming of one frequency should not compromise the navigation capability. The operator should provide a procedure to deal with such cases unless other sensors are available.

(4) The operator should ensure that no space weather event is predicted to disrupt the GNSS reliability and integrity at both the destination and the alternate.

(5) The operator should verify the availability of RAIM for all phases of flight based on GNSS, including navigation to the alternate.

(6) The operator's MEL should reflect the elements in paragraphs (b)(1) and (b)(2).

22. The following GM2 SPO.OP.152 is inserted:

GM2 SPO.OP.152 Destination aerodromes — instrument approach operations

GNSS RELIABILITY AND INTEGRITY — HELICOPTERS

(a) Redundancy of on-board systems should ensure that no single on-board equipment failure (e.g. antenna, GNSS receiver, FMS, or navigation display failure) results in the loss of the GNSS capability.

(b) Any shadowing of the GNSS signal or jamming of the GNSS frequency from the ground is expected to be of a very short duration and affect a very small area. Additional sensors or functions such as inertial coasting may be used during jamming events.

(c) The availability of GNSS signals can be compromised if space weather events cause 'loss of lock' conditions and more than one satellite signal may be lost on a given GNSS frequency. Until space weather forecasts are available, the operator may use 'nowcasts' as short-term predictions for helicopter flights of short durations.

(d) SBAS also contributes to mitigate space weather effects, both by providing integrity messages and by correcting ionosphere-induced errors.

(e) Even though SBAS should be available and used, RAIM should remain available autonomously. In case of loss of the SBAS, the route and the approach to the destination or alternate should still be flown with an available RAIM function.

(f) When available, GNSS based on more than one constellation and more than one frequency may provide better integrity and redundancy regarding failures in the space segment of the GNSS, jamming, and resilience to space weather events.

Explanatory note to AMC1 and GM1 SPO.OP.152

This NPA proposes this new AMC and GM to achieve the specific objective described in Section 2.3.1: Enable onshore IFR operations by providing additional options: Increase the number of available and accessible alternates within the available fuel range.

As it is impossible to mention future standards or to refer to unavailable systems in the AMC material, the AMC should be revised in the future to ensure that multi-constellation multi-frequency GNSS is implemented when available, whenever operators rely on GNSS for both the approach to the destination and to the alternate.

The use of SBAS and the redundancy of on-board systems are expected to remain necessary to ensure that no single on-board equipment failure (e.g. antenna, GNSS receiver, FMS, or navigation display failure) can compromise safety.

See also explanatory note to AMC1 and GM1 CAT.OP.MPA.192(d).

23. AMC1 SPO.OP.215 is amended as follows:

AMC1 SPO.OP.215 Commencement and continuation of approach ~~— aeroplanes and helicopters~~

~~VISUAL REFERENCES FOR INSTRUMENT APPROACH OPERATIONS~~ RVR MINIMUM FOR CONTINUATION OF APPROACH

(a) The controlling RVR should be the touchdown RVR.

(b) If the touchdown RVR is not reported, then the midpoint RVR should be the controlling RVR.

(c) Where the RVR is not available, converted meteorological visibility (CMV) should be used.

~~(a) NPA, APV and CAT I operations~~

~~At DH or MDH, at least one of the visual references specified below should be distinctly visible and identifiable to the pilot:~~

~~(1) elements of the approach lighting system;~~

~~(2) the threshold;~~

~~(3) the threshold markings;~~

~~(4) the threshold lights;~~

~~(5) the threshold identification lights;~~

~~(6) the visual glide slope indicator;~~

~~(7) the touchdown zone or touchdown zone markings;~~

~~(8) the touchdown zone lights;~~

~~(9) FATO/runway edge lights; or~~

~~(10) other visual references specified in the operations manual.~~

~~(b) Lower than standard category I (LTS CAT I) operations~~

~~At DH, the visual references specified below should be distinctly visible and identifiable to the pilot:~~

~~(1) a segment of at least three consecutive lights, being the centreline of the approach lights, or touchdown zone lights, or runway centreline lights, or runway edge lights, or a combination of them; and~~

~~(2) this visual reference should include a lateral element of the ground pattern, such as an approach light crossbar or the landing threshold or a barrette of the touchdown zone light unless the operation is conducted utilising an approved HUDLS usable to at least 150 ft.~~

~~(c) CAT II or other-than standard category II (OTS CAT II) operations~~

~~At DH, the visual references specified below should be distinctly visible and identifiable to the pilot:~~

~~(1) a segment of at least three consecutive lights, being the centreline of the approach lights, or touchdown zone lights, or runway centreline lights, or runway edge lights, or a combination of them; and~~

~~(2) this visual reference should include a lateral element of the ground pattern, such as an approach light crossbar or the landing threshold or a barrette of the touchdown zone light unless the operation is conducted utilising an approved HUDLS to touchdown.~~

~~(d) CAT III operations~~

~~(1) For CAT IIIA operations and for CAT IIIB operations conducted either with fail-passive flight control systems or with the use of an approved HUDLS: at DH, a segment of at least three consecutive lights, being the centreline of the approach lights, or touchdown zone lights, or runway centreline lights, or runway edge lights, or a combination of them is attained and can be maintained by the pilot.~~

~~(2) For CAT IIIB operations conducted either with fail-operational flight control systems or with a fail-operational hybrid landing system using a DH: at DH, at least one centreline light is attained and can be maintained by the pilot.~~

~~(3) For CAT IIIB operations with no DH there is no requirement for visual reference with the runway prior to touchdown.~~

~~(e) Approach operations utilising EVS — CAT I operations~~

~~(1) At DH or MDH, the following visual references should be displayed and identifiable to the pilot on the EVS:~~

~~(i) elements of the approach light; or~~

~~(ii) the runway threshold, identified by at least one of the following:~~

~~(A) the beginning of the runway landing surface,~~

~~(B) the threshold lights, the threshold identification lights; or~~

~~(C) the touchdown zone, identified by at least one of the following: the runway touchdown zone landing surface, the touchdown zone lights, the touchdown zone markings or the runway lights.~~

~~(2) At 100 ft above runway threshold elevation at least one of the visual references specified below should be distinctly visible and identifiable to the pilot without reliance on the EVS:~~

~~(i) the lights or markings of the threshold; or~~

~~(ii) the lights or markings of the touchdown zone.~~

~~(f) Approach operations utilising EVS – APV and NPA operations flown with the CDFA technique~~

~~(1) At DH/MDH, visual references should be displayed and identifiable to the pilot on the EVS image as specified under (a).~~

~~(2) At 200 ft above runway threshold elevation, at least one of the visual references specified under (a) should be distinctly visible and identifiable to the pilot without reliance on the EVS.~~

Explanatory note to AMC1 SPO.OP.215

The intent is full alignment with Part-NCC. See NPA 2018-06(C).

24. The following GM1 SPO.OP.215 is inserted:

GM1 SPO.OP.215 Commencement and continuation of approach

APPLICATION OF RVR OR VIS REPORTS

(a) There is no prohibition on the commencement of an approach based on the reported RVR or VIS. The restriction in CAT.OP.MPA.305 applies only if the RVR or VIS is reported and applies to the continuation of the approach past a point where the aircraft is 1 000 ft above the aerodrome elevation or in the FAS, as applicable.

(b) If a deterioration in the RVR or VIS is reported once the aircraft is below 1 000 ft or in the FAS, as applicable, then there is no requirement for the approach to be discontinued. In this situation, the normal visual reference requirements would apply at the DA/H.

(c) Where additional RVR information is provided (e.g. midpoint and stop end), this is advisory; such information may be useful to the pilot in order to determine whether there will be sufficient visual reference to control the aircraft during roll-out and taxi. For operations where the aircraft will be controlled manually during roll-out, Table 1.A in AMC1 SPA.LVO.100(a) provides an indication of the RVR that may be required to allow manual lateral control of the aircraft on the runway.

Explanatory note to GM1 SPO.OP.215

The intent is full alignment with Part-NCC. See also explanatory note to SPO.OP.215 and the extracts of NPA 2018-06(C) provided in Section 2.3.1 of this NPA.

25. The following AMC1 SPO.OP.215(a) is inserted:

AMC1 SPO.OP.215(a) Commencement and continuation of approach

APPROACHES WITH NO INTENTION TO LAND

If the intention is to execute a missed approach at or before the DA/H or the MDA/H, for example for training, then the approach may be continued regardless of the reported RVR or VIS. Such operations should be coordinated with the air traffic services (ATS).

Explanatory note to AMC1 SPO.OP.215(a)

The intent is full alignment with Part-NCC. See NPA 2018-06(C).

26. The following AMC1 SPO.OP.215(b) is inserted:

AMC1 SPO.OP.215(b) Commencement and continuation of approach

VISUAL REFERENCES FOR INSTRUMENT APPROACH OPERATIONS

For instrument approach operations Type A and CAT I instrument approach operations Type B, at least one of the visual references specified below should be distinctly visible and identifiable to the pilot at the MDA/H or the DA/H:

(a) elements of the approach lighting system;

(b) the threshold;

(c) the threshold markings;

(d) the threshold lights;

(e) the threshold identification lights;

(f) the visual glideslope indicator;

(g) the TDZ or TDZ markings;

(h) the TDZ lights;

(i) FATO/runway edge lights;

(j) for helicopter PinS approaches, the identification beacon light;

(k) for helicopter PinS approaches, the identifiable elements of the environment defined on the instrument chart;

(l) for helicopter PinS approaches with instructions to 'proceed VFR', sufficient visual cues to determine that VMC are met; or

(m) other visual references specified in the operations manual.

Explanatory note to AMC1 SPO.OP.215(b)

The intent is full alignment with Part-NCC. See AMC1 NCC.OP.230 of this NPA.

4. References

4.1. Affected regulations

— Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 296, 25.10.2012, p. 1)

4.2. Affected decisions

— Decision 2014/015/R of the Executive Director of the Agency of 24 April 2014 adopting Acceptable Means of Compliance and Guidance Material to Part-CAT of Regulation (EU) No 965/2012 and repealing Decision 2012/018/R of the Executive Director of the Agency of 24 October 2012 ('AMC and GM to Part-CAT – Issue 2')

— Decision N° 2012/019/Directorate R of the Executive Director of the Agency of 24th October 2012 on Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council ('Acceptable Means of Compliance and Guidance Material to Part-SPA')

— Decision N° 2013/021/Directorate R of the Executive Director of the Agency of 23 August 2013 on adopting Acceptable Means of Compliance and Guidance Material for Non-commercial operations with complex motor-powered aircraft (Part-NCC)

— Decision N° 2014/008/R of the Executive Director of the Agency of 24 April 2014 on adopting Acceptable Means of Compliance and Guidance Material to part-SPO of Regulation (EU) No 965/2012 (Part-SPO)

4.3. Other reference documents

— NPA 2018-06 (A)(B)(C)(D) — All-weather operations (RMT.0379)

— Eurocontrol safety case for helicopter PinS approaches; helicopter PinS departures and helicopter low level routes

The safety case is accessible to anyone with a 'onesky' account or willing to create one.

— FAA COPTER CAT II Regulations

5. Quality of the document

If you are not satisfied with the quality of this document, please indicate the areas which you believe could be improved and provide a short justification/explanation:

— technical **quality** of the draft proposed rules and/or regulations and/or the draft proposed amendments to them

— text clarity and readability

— quality of the impact assessment (IA)

— others (please specify)

Note: Your replies and/or comments to this section shall be considered for internal quality assurance and management purposes only and will not be published in the related CRD.