



# European Aviation Safety Agency — Rulemaking Directorate

## Notice of Proposed Amendment 2013-10

### Helicopter offshore operations

RMT.0409 & RMT.0410 (OPS.093(a)&(b)) — 06/06/2013

#### EXECUTIVE SUMMARY

This Notice of Proposed Amendment (NPA) addresses the safety risks identified for helicopter operations to offshore locations.

The specific objective is to mitigate these risks by:

- assessing which CAT IRs need to be amended and complemented taking into account the situation in the Member States as well as the results of conducted studies;
- assessing if all offshore-related provisions should be included in a new subpart of Part-SPA, thus becoming a specific approval;
- assessing the risk and mitigating measures for non-commercial and specialised operations and, as appropriate, propose appropriate requirements;
- assessing whether new technology, either available or in use by some Member States, should be considered as a regulatory requirement.

This NPA proposes to ask for the introduction of a specific approval for all helicopter offshore operations as a new subpart to Annex V (Part-SPA) to Commission Regulation (EU) No 965/2012.

The proposed changes are expected to maintain the current high safety level of the operations achieved by the Member States where most of the offshore operations take place.

Proportionality and level playing field for helicopter offshore operations are ensured by appropriate safety measures for the different types of operations. While CAT, NCC and SPO operators are required to follow the new Subpart SPA.HOFO, NCO operations are excluded from these operations.

Applicability		Process map	
Affected regulations and decisions:	Cover Regulation Air Operations, Annex I Definitions, Part-ARO, Part-CAT, Part-SPA, Part-NCC, Part-SPO and associated AMC/GM.	Concept Paper:	No
Affected stakeholders:	Air operators and NAAs	Terms of Reference:	07/10/2011
Driver/origin:	Industry and Member States request	Rulemaking group:	Yes
Reference:	N/A	RIA type:	Full
		Technical consultation during NPA drafting:	Yes
		Duration of NPA consultation:	3 months
		Review group:	Yes
		Focussed consultation:	No
		Publication date of the Opinion:	2014/Q3
		Publication date of the Decision:	2015/Q3

## **NOTICE OF PROPOSED AMENDMENT (NPA) 2013-10**

### **DRAFT OPINION OF THE EUROPEAN AVIATION SAFETY AGENCY**

**for a Commission Regulation (EU) No .../... amending Commission Regulation (EU) No 965/2012 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**

**and**

### **DRAFT DECISION OF THE EXECUTIVE DIRECTOR OF THE EUROPEAN AVIATION SAFETY AGENCY**

**amending Decisions 2012/016/R, 2012/018/R and 2012/019/R of the Executive Director of the European Aviation Safety Agency of 24 and 25 October 2012 on air operations**

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## A. Explanatory Note

### I. Introduction

1. Helicopter offshore operations (HOFO) were introduced as a result of exploration for oil below the seabed in the North Sea. Based on experience gained from a high number of accidents and serious incidents during the 1970s and 1980s, the Member States conducting the majority of these helicopter offshore operations together with the industry introduced national safety regulations and best practices. Later, the Joint Aviation Authorities (JAA) requirements JAR-OPS 3 were developed and implemented. The Member States from where the majority of offshore operations were conducted continued to apply additional specific national rules and offshore approvals for the operations to ensure an appropriate level of safety in these sometimes challenging environments.
2. Although conforming to JAR-OPS 3, some national rules were not similar between the Member States. And as the offshore industry is progressing into more and new areas, these national regulations might be expected to differ more as authority oversight will do too.
3. With Commission Regulation (EU) No 965/2012<sup>1</sup> and associated Opinions<sup>2,3</sup> helicopter offshore operations may be performed at proportionate different safety levels as commercial air transport (CAT), non-commercial operations with complex motor-powered helicopters (NCC), other-than-complex motor-powered helicopters (NCO) and specialised operations (SPO)<sup>4</sup>.
4. Norway and the United Kingdom, from where the majority of all CAT helicopter offshore operations are performed, together with Denmark and Ireland consider that the current text of Commission Regulation (EU) No 965/2012 does not allow the maintenance of present safety levels, as additional requirements that are in place in these Member States are not reflected.
5. Two rulemaking proposals were forwarded to the Agency: one for a flight following system for helicopters conducting CAT offshore operations in a hostile environment, and another one for specific approval for offshore operations. The latter was in the format of a draft rule and incorporated the first proposal.
6. A Preliminary Regulatory Impact Assessment (Pre-RIA) was submitted to AGNA/SSCC in August 2011.
7. The Terms of Reference (ToR)<sup>5</sup> were published on the Agency's website on 7 October 2011.

<sup>1</sup> 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).

<sup>2</sup> Opinion No 01/2012 'Air Operations-OPS (Part-NCC and Part-NCO)'.

<sup>3</sup> Opinion No 02/2012 'Air Operations-OPS (Part-SPO)'.

<sup>4</sup> The terms 'SPO' and 'aerial work' are used interchangeably throughout the document.

<sup>5</sup> [http://easa.europa.eu/rulemaking/docs/tor/ops/EASA-ToR-OPS.093%20\(a\)%20&%20\(b\)%20\(RMT.0409%20&%20RMT.0410\).pdf](http://easa.europa.eu/rulemaking/docs/tor/ops/EASA-ToR-OPS.093%20(a)%20&%20(b)%20(RMT.0409%20&%20RMT.0410).pdf)

## II. Scope

8. The scope of this rulemaking activity is defined in the ToR as follows:

To develop regulatory requirements (IR and AMC/GM) to harmonise the rules for offshore helicopter operations at EU level to ensure a level playing field whilst ensuring that the necessary levels of safety are maintained. This includes the following:

- To assess which CAT IRs need to be amended and complemented taking into account the situation in Member States as well as results of supplied studies.
- To assess if all offshore-related provisions should be included in a new subpart of Part-SPA, thus becoming a specific approval.
- To assess the risk and mitigating measures for non-commercial and specialised operations and, as appropriate, propose appropriate requirements<sup>6</sup>.
- To assess if new technology, either available or in use by some Member States, should be considered a regulatory requirement.

## III. Process

9. The Agency developed this Notice of Proposed Amendment (NPA) in line with Regulation (EC) No 216/2008 (hereafter referred to as the 'Basic Regulation')<sup>7</sup> and the Rulemaking Procedure established by the EASA Management Board<sup>8</sup>.
10. This rulemaking activity is included in the Agency's Rulemaking Programme for 2011, task No RMT.0409 (OPS.093(a)) & RMT.0410 (OPS.093(b)).
11. A corresponding Rulemaking Group consisting of representatives from National Aviation Authorities (NAAs), operators, manufacturers and pilot associations was established in 2011, concentrating on the task described in the Terms of Reference (ToR).
12. During 5 meetings covering 13 workdays, the group defined the risks associated with offshore operations and established mitigating measures that include safety recommendations issued by aircraft accident investigation boards (AAIB). The RIA contains the list of risks and mitigating measures.
13. The text of this NPA has been developed by the Agency considering the input from the Rulemaking Group and from the Agency. It is open for public consultation for **3 months** in line with Article 6.4 of the Rulemaking Procedure.

<sup>6</sup> Concerning NCC/NCO/SPO the Agency has been working on the basis of its Opinion. Adaptations may need to be made at a later stage when the outcome of the Comitology process is better known.

<sup>7</sup> Regulation (EC) No 216/2008 of the European Parliament and the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1), as last amended by Regulation (EU) No 6/2013 of 8 January 2013 (OJ L 4, 9.1.2013, p. 34).

<sup>8</sup> EASA Management Board Decision concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material (Rulemaking Procedure), EASA MB 08-2007, 13.6.2007, as last amended and replaced by EASA MB Decision No 01-2012 (13.3.2012).

14. Following the closing date of the NPA public consultation, the Agency will consider all comments and will publish a Comment-Response Document (CRD). The CRD will be available on the Agency's website and in the Comment-Response Tool (CRT).
15. Following the CRD publication, the Agency will perform a final review and will publish the Opinion and Decision in due course.
16. The Decision (containing AMC and GM) will be suspended by the Agency until the related Regulation is adopted by the Commission.

#### **IV. General aspects of offshore operations**

17. What is an offshore operation?

In Annex I — Definitions for terms used in Annexes II to V to Commission Regulation (EU) No 965/2012, offshore operations are defined as 'operations which routinely have a substantial proportion of the flight conducted over sea areas to or from offshore locations'.

The definition leaves room for interpretation and consequently may lead to implementation differences in Member States. First of all, it is not at all certain that Member States apply it only to operations to offshore platforms but may go beyond; taking into account for example aerial work conducted for offshore wind mill farms. In that sense, the definition may be not adapted to the growing market of offshore operations. Secondly, the notion of 'routinely have a substantial proportion of the flight over sea areas' is rather vague. For example, a Member State could interpret it with non-harmonised criteria in terms of distance or time over sea. Thirdly, the term 'offshore location' is not further defined.

The Agency proposes that offshore operations are all flights over open sea areas to a location in the sea. The definition of offshore operations is therefore proposed to be amended as follows:

'Offshore operations' means a helicopter operation that has a substantial proportion of any flight conducted over open sea areas to or from an offshore location for the purpose of:

- support to offshore oil, gas and mineral exploration, production, storage and transport;
- support to offshore wind turbine and other renewable energy sources;
- support to marine lights<sup>9</sup>; or
- sea-pilot transfer.

Consequently, when the term 'offshore operations' is used in this document, it refers to this definition.

'Offshore location' is being defined as any location in the sea to where offshore operations are performed.

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<sup>9</sup> Marine lights are understood as lighthouses located off the coastline where operations are performed to a helideck on top of the lighthouse, or as hoisting operations directly to the lighthouse.

## 18. What is a hostile environment?

The water overflowed during offshore operations is divided into hostile and non-hostile areas.

According to Annex I Definitions, 'hostile environment' means:

- (a) An environment in which:
  - (1) a safe forced landing cannot be accomplished because the surface is inadequate;
  - (2) the helicopter occupants cannot be adequately protected from the elements;
  - (3) search and rescue response/capability is not provided consistent with the anticipated exposure; or
  - (4) there is an unacceptable risk of endangering persons or property on the ground.
- (b) In any case, the following areas:
  - (1) for overwater operations, the open sea areas north of 45N and south of 45S designated by the authority in the State concerned;
  - (2) those parts of a congested area without adequate safe forced landing areas.

Hostile environment in relation to helicopter offshore operations shall be understood as environment particularly covered in items (a)(1), (a)(2), (a)(3) and (b)(1). In Europe this means mainly the North Sea and the Mediterranean Sea.

Operations in such hostile environments are subject to stringent regulations in relation to helicopter ditching design, installed safety equipment such as life rafts, ELT and emergency lighting system, and also to personal safety equipment such as survival suits and life jackets.

It was found that especially paragraph (b)(1) as concerns the designation of open sea areas north of 45N and south of 45S is not uniformly implemented. Some MS do not designate these areas as hostile while others do. It is however clear that the safety risks are the same in all open sea areas north of 45N, whether there is a designation of the State or not. It is therefore proposed to delete the designation aspect from the definition for the purpose of air operations requirements. Any open sea areas north of 45N and south of 45S are therefore considered hostile environment by default.

## 19. Extended overwater flights

The Agency also looked into the issue of extended overwater flights not associated with flying to offshore locations. The Agency found that the risks for extended overwater flights are similar to the risks for helicopter offshore operations. However, in consultation with the rulemaking group it was decided to address extended overwater flights not associated with flying to offshore locations in a separate rulemaking task at a later stage. This NPA is, therefore, only concentrating on helicopter operations to and from offshore locations (helicopter offshore operations).



**V. Summary of the proposed changes**

20. This NPA is proposed by the Agency to harmonise safety standards and authority oversight in order to ensure an EU level playing field for helicopter offshore operations for commercial air transport, non-commercial operations, and specialised operations.
21. Concerning terminology, as already indicated above, the definition for offshore operations and hostile environment will be amended together with the introduction of a definition for offshore location.
22. The main proposed change is the introduction of a harmonised set of rules included in a designated Subpart K — HOFO to Annex V to Part-SPA. These proposed rules are:
  - based on a risk matrix developed by the Agency together with the rulemaking group (refer to Annex A of this NPA),
  - take into account national rules established by Member States as well as industry best practices, and
  - consider safety recommendations and latest studies assessing the safety level in helicopter offshore operations.
23. It is proposed that the rules apply to commercial air transport operators, non-commercial operators of complex motor-powered aircraft and specialised operators. While the activities might differ, the risks for these types of operations when flying to offshore locations are the same. The proposed provisions in Part-SPA are therefore almost the same for all types of operations, as is the case for any other specific approval. It can be argued that the expected safety levels are lower for SPO and NCC operations. And this is taken into account by proposing proportionate requirements, also taking into account the underlying basic rules Part-ORO/-CAT/-NCC/-SPO. However, with new activities emerging in the offshore sector and considering the identified risks, it was not considered an option to leave SPO and NCC operations aside.
24. The Agency also assessed in how far the proposed provisions should be applicable to non-commercial operators of other than complex motor-powered helicopters. The expected safety level for such operation is much lower compared to the other types of operations. It is assumed that such operations mainly cover private owner/pilot operations or operations within an aero club. Offshore operations are typically not conducted by such operators. Therefore, no changes will be proposed for NCO operators. Since at the same time no prohibition will be included in Part-NCO, it means that any private operator with a non-complex helicopter could operate in an offshore environment without any restriction.
25. In this respect stakeholders are particularly invited to comment on the following question:

**Question 1**

Do stakeholders agree with the exclusion of NCO operators from this proposal? If not, which restrictions should be applied to NCO operators and why?

26. The proposal foresees that operators must hold a specific approval (SPA) for conducting helicopter offshore operations. The Agency developed generic criteria to be used to determine whether an additional approval is required or whether such operations can be conducted and overseen by

applying the normal declaration or certification (AOC) process. The criteria used are the following:

- (a) The aircraft has an airworthiness approval covering the type of envisaged operations.

Concerning helicopter offshore operations, helicopters shall have been granted the following additional airworthiness certification for:

- landing on water or ditching; and
- emergency flotation equipment.

- (b) The complexity of said operations presents particular challenges.

Helicopter offshore operations represent particular challenges as depicted in the risk and mitigation measures matrix (refer to Annex A).

- (c) The concept and systems upon which the operation will be carried out are mature enough (= not 'new').

Although these types of operations are conducted since the 1970s, the operation and environment remain challenging and require a number of additional mitigation measures. Research and safety reviews constantly conducted for these types of operations always recommend new technologies to be used.

- (d) The risk associated with improper operation (including third parties in the air or on the ground) is tolerable.

An incident over a sea can always have catastrophic outcome because of the environment, availability of search and rescue, etc.

- (e) Accuracy and integrity of data used for navigation is ensured.

Separation in non-controlled airspace is provided by on board area navigation systems, in particular GPS. Operators apply industry best practices for ensuring the accuracy and integrity of data used for navigation. It was assessed if the requirements of CAT.IDE.A.355 Electronic data management should be transposed for helicopter offshore operations. However, they were considered too rigorous. General operating procedures stipulated in the new rules are deemed to be appropriate. .

- (f) Appropriate training and checking standards and procedures for that type of operations exist and are implemented, mainly for pilots.

Due to the higher risks, additional provisions are proposed.

A SPA approval is considered as a means to allow stricter authority oversight as any operation can only be conducted after having demonstrated full compliance with the rules and having been granted the approval by the competent authority. Any change affecting the operation will need prior authority approval. This might not be such a change for AOC holders who are anyway subject to a certification process. However, non-commercial and specialised operators might be impacted to a larger extent. This impact is assessed in the RIA. In this respect stakeholders are particularly invited to comment on the following question:

**Question 2**

Do stakeholders agree that the OPS requirements should stipulate a specific approval (SPA) for helicopter offshore operations whether they are commercial or non-commercial? If not, why not, which types of operations should possibly be excluded from the approval requirement and how can the identified risks and necessary level of oversight be ensured?

27. A suggested option by the rulemaking group was to require operators to be issued an AOC before obtaining a specific approval for helicopter offshore operations. As an AOC can only be issued for CAT operators, this would have restricted the helicopter offshore operations market. In particular for aerial work operations it is difficult to justify the compliance with all CAT requirements which are directed to the protection of passengers while for aerial work the protection of third parties as well as crew members and task specialists is paramount. Also, the expected safety levels are not the same for commercial and non-commercial operations. The proposal is therefore not taken into account for proportionality reasons and because the requirements stipulated in Part-SPA are considered sufficient to establish an acceptable level of safety. The Agency does, however, support a suggestion to introduce and maintain a stringent set of rules, introducing a higher safety level than required by the current regulations for NCC and SPO. This is effectively included in Part-SPA. Stakeholders are particularly invited to comment on the following question:

**Question 3**

Do stakeholders consider it a prerequisite for operators to be issued an AOC to obtain a specific approval (SPA) for helicopter offshore operation?

If so, what is the justification for such requirement?

28. Furthermore, in terms of eligible helicopters to be used under the proposed offshore rules, it is highlighted that they need to be certified in category A or equivalent (refer also to GM1 CAT.POL.H.200 & CAT.POL.H.300 & CAT.POL.H.400 explaining which helicopters are being considered equivalent). This is implied by mandating compliance with Performance Class 2 requirements. While this may not represent a change for commercial air transport operations, there could be an impact in particular on aerial work operators. The Agency likes to draw attention to this point and welcomes any comments. As the extent of aerial work offshore operations as well as their national regulatory environment is not known, it is difficult to establish which impact such requirement may have.
29. The proposal also foresees the fitment of VHM systems to all helicopters operating in a hostile environment as commercial air transport operations. This goes beyond ICAO recommendations as well as rules and best practices implemented in the majority of Member States. VHM is mainly implemented for commercial air transport operations using helicopters with a maximum take-off mass exceeding 3175 kg or a maximum operational passenger seating configuration of more than 9. The Agency decided to propose the fitment for all helicopters in CAT operations as the VHM system has been shown to provide the first warning for approximately 69 % of the rotor and rotor drive system failure types being monitored and approximately 60 % of all the potentially catastrophic rotor drive system failure cases. According to the UK AAIB the rate of accidents due to rotor

or rotor drive system failures has reduced dramatically in the UK since VHM was introduced. Incidents of serious vibration occurring in-flight have also been reduced. VHM systems are available for all CS-29 as well as CS-27 multi-engine helicopters. In relation to this requirement stakeholders are invited to particularly comment on the following question:

**Question 4**

Do stakeholders see a benefit in fitting all helicopters, complex and non-complex, used in CAT with a VHM system?

If not, which other mitigation measures are considered suitable to detect early deterioration of components?

30. Furthermore, in relation to the requirement for a vibration health monitoring (VHM) system, the Agency proposes an implementation time frame of 1 year from the date of applicability of the Regulation for new helicopters, and 2 years for retrofit into existing helicopters. Stakeholders are invited to comment on the proposed timeframes:

**Question 5**

Do stakeholders consider the proposed timeframes appropriate? If not, which timeframes are considered appropriate and why?

31. Another new requirement concerns the implementation of a Flight Data Monitoring (FDM) Programme for CAT operators using helicopters equipped with a flight data recorder. No specific transitional periods are included yet. However, based on experience the Agency estimates that the set-up of a FDM programme may require 2-3 years. Stakeholders are particularly invited to comment on the following question:

**Question 6**

What are considered appropriate implementation timeframes concerning the establishment of a FDM programme?

32. For NCC and SPO operators additional equipment will be required as follows:

A radio altimeter capable of emitting an audio warning below a preset height and a visual warning at a height selectable by the pilot for NCC and SPO operators. Such radio altimeter enables the flight crew to appropriately detect the sink rate of the helicopter and assists in better maintaining low altitude.

Airborne weather detecting equipment for other than complex motor-powered helicopters used for SPO operations (requirement already exists for NCC and SPO operators using complex motor-powered aircraft). Such equipment helps in circumnavigate or avoid dangerous weather conditions.

33. Related to the general applicability of the new rules, it is proposed to consider a timeframe of 1 year for the authorities and industry to adapt. The transition timeframes on VHM and FDM would come on top of this general transition.
34. Finally, this NPA proposes 3 additional AMC and 1 additional GM to Part-CAT. These AMC and GM are particularly valid for offshore operations but as they remain in Part-CAT could also affect other CAT operations. It is considered that this AMC/GM is of safety benefit for all CAT operations. Firstly, in relation to operations without an assured safe forced landing capability (performance class 2), the Agency proposes to include an AMC to

specify that the risk assessment and conditions under which the approval is granted must be kept up to date.

Secondly, in relation to performance class 2 take-off and landing the Agency proposes to include an AMC asking the operator to use appropriate procedures and planning criteria to minimise the risk of collision with the deck edge and obstacles at or below the helideck level. Competent authorities reported that such procedures are not necessarily established by operators today.

Thirdly, the Agency proposes to include an AMC on radio altimeter analogue height presentation. This aims at enhancing safety during approaches and low level operations. It is considered that digital presentations of radar altitudes are more susceptible to misinterpretations than analogue ones. An analogue presentation allows the flight crew to better detect an abnormal sink rate or precisely identify a maintained low height. This proposal stems from AIB recommendations and was initially worded as 'Radio altimeters, with both audio and visual decision height warning, should be fitted to all helicopters operating offshore' in UK AAIB reports 4/1983 (G-ASWI), 2/1984 (G-BDIL) and 8/1984 (G-BEON) after helicopter ditching occurrences. Following the AAIB recommendations the majority of helicopter offshore operators fitted analogue radio altimeters.

Lastly, UK AAIB report 1/2011 (G-REDU), also relating to a ditching occurrence, requested CAA UK (among other issues) to ensure that crews are provided with adequate height warning to enable them take corrective action. Following this recommendation CAA UK amended Civil Aviation Publication (CAP) 562. Parts of CAP 562 are included in a new GM. The Agency is also reviewing if parts of this GM could be included in MG 20.

35. The NPA proposes the following amendments to Commission Regulation (EU) No 965/2012:

(a) Cover Regulation:

- (1) new subparagraph in paragraph 2 of Article 5 to establish the applicability for the new subpart in SPA;
- (2) deletion of the derogation in paragraph 4 of Article 6; and
- (3) general transition provisions

(b) Annex I DEF (Definitions and terms used in Annexes II–V):

- (1) amend the definition of 'hostile environment',
- (2) include a definition for 'offshore location' and
- (3) amend the definition of 'offshore operations'.

(c) Annex II Part-ARO (Authority requirements for air operations):

- (1) include a line for offshore operations in the OPSSPECS in Appendix II and
- (2) amend a footnote to the List of specific Approvals in Appendix V to include the acronym HOFO.

(d) Annex IV Part-CAT (Commercial air transport):

The following paragraphs are deleted from Part-CAT and transferred to Part-SPA, Subpart K, Helicopter offshore operations (HOFO), either in total or partially:

- (1) CAT.OP.MPA.120 Airborne radar approaches (ARAs) for overwater operations — helicopters,
  - (2) CAT.OP.MPA.181 Selection of aerodromes and operating sites — helicopters,
  - (3) CAT.OP.MPA.247 Meteorological conditions — helicopters,
  - (4) CAT.IDE.H.280 Emergency locator transmitter (ELT),
  - (5) CAT.IDE.H.295 Crew survival suits, and
  - (6) CAT.IDE.H.310 Additional requirements for helicopters conducting offshore operations in a hostile environment.
- (e) Annex V Part-SPA (Specific Approval):
- Introduce a new Subpart K — Helicopter offshore operations (HOFO) including requirements that are either transferred from Part-CAT/-NCC/-SPO or proposed as safety mitigation through the rulemaking process.
- (f) Annex VI Part-NCC:
- Delete subparagraph (b)(3) to NCC.OP.152 Destination alternate aerodromes — helicopters, subparagraph (b) to NCC.IDE.H.215 Emergency locator transmitter (ELT), subparagraph (a) to NCC.IDE.H.226 Crew survival suits and paragraph NCC.IDE.H.231 Additional requirements for helicopters conducting offshore operations in a hostile sea area as they are now covered in Part-SPA.
- (g) Annex VIII Part-SPO:
- (1) Delete subparagraph (b)(3) to SPO.OP.151 Destination alternate aerodromes — helicopters as it is now covered in Part-SPA.
  - (2) Delete subparagraph (a) to SPO.IDE.H.198 Survival suits — complex motor-powered helicopters and delete paragraph SPO.IDE.H.201 Additional requirements for helicopters conducting offshore operations in a hostile sea area — complex motor-powered helicopters as they are now covered in Part-SPA. However, these requirements are proposed to be applicable to any SPO operator whether operating complex or non-complex aircraft. Part-SPO does not include similar regulations for non-complex helicopters at this moment in time. When operating according to Part-SPA, Subpart K these requirements are proposed to be applicable to all operations, including SPO using non-complex helicopters.

36. Furthermore, this NPA proposes the following amendments to Decisions 2012/016/R, 2012/018/R and 2012/019/R of the Executive Director of the European Aviation Safety Agency of 24 October 2012 on Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 965/2012:

(a) Annex II, Part-ARO (Authority requirements for air operations)

The following AMC and GM are introduced:

- (1) AMC3 and GM1 ARO.OPS.200 Specific approval procedure for offshore operations

(b) Annex IV, Part-CAT

The following AMC and GM are deleted from Part-CAT and transferred to Part-SPA, Subpart K, Helicopter offshore operations (HOFO) either in total or partially:

- (1) AMC2 CAT.OP.MPA.105 Use of aerodromes and operating sites,
- (2) AMC1 CAT.OP.MPA.120 Airborne radar approaches (ARAs) for overwater operations — helicopters,
- (3) GM1 CAT.OP.MPA.120 Airborne radar approaches (ARAs) for overwater operations — helicopters,
- (4) AMC1 CAT.OP.MPA.181(b)(1) Selection of aerodromes and operating sites — helicopters,
- (5) GM1 CAT.OP.MPA.181 Selection of aerodromes and operating sites — helicopters, and
- (6) AMC1 CAT.OP.MPA.181(d) Selection of aerodromes and operating sites — helicopters.

The following AMC and GM shall be introduced to Part-CAT:

- (7) AMC1 CAT.POL.H.305(a) Operations without an assured safe forced landing capability on the validity of the risk assessment.
- (8) AMC1 CAT.POL.H.310(c)(2) Take-off & CAT.POL.H.325(c)(2) Landing, on procedures minimising the risk of collision with the deck edge or obstacles.
- (9) AMC2 CAT.IDE.H.145 Radio altimeters on analogue display, and.
- (10) GM1 CAT.IDE.145 Radio altimeter to include requirements for audio voice alerts.

(c) Annex V, Part-SPA Subpart K — Helicopter offshore operations (HOFO)

Introduce required AMC and GM either as relocated items form Part-CAT/-NCC/-SPO or proposed during the rulemaking process.

(d) Annex VI, Part NCC

The following AMC and GM are deleted from Part-NCC as they are already covered by Part-SPA, Subpart K, Helicopter offshore operations (HOFO):

AMC1 NCC.OP.152 Destination alternate aerodromes — helicopters, and AMC1 NCC.IDE.H.231 Additional requirements for helicopters conducting offshore operations in a hostile sea area.

## (e) Annex VIII, Part-SPO

The following AMC and GM are changed:

AMC4 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters.

Table 1.H Take-off — helicopters (without LVTO approval) — RVR/Visibility

Add text: Valid only for operators holding a SPA.HOFO approval.

The following AMC and GM are deleted from Part-SPO as they are already covered by Part-SPA, Subpart K, Helicopter offshore operations (HOFO):

AMC1 SPO.OP.156 Destination alternate aerodromes — helicopters and AMC1 SPO.IDE.H.201 Additional requirements for helicopters conducting offshore operations in a hostile sea area

## VI. Summary of the Regulatory Impact Assessment

### Background

Based on experience gained from a high number of accidents and serious incidents during the 1970s and 1980s, Member States conducting the majority of helicopter offshore operations together with the industry, introduced national safety regulations and best practice. When the JAA requirements JAR-OPS 3 were developed and implemented, these Member States continued to apply additional specific national rules and offshore approvals for this kind of operations to ensure an appropriate level of safety in these sometimes challenging environments.

The fact that these rules are nationally driven can be explained by the fact that 70 % of the helicopter fleet for offshore operations is registered in four Member States: Denmark, the Netherlands, Norway and the United Kingdom.

With Commission Regulation (EU) No 965/2012 and associated Opinions<sup>10,11</sup> helicopter offshore operations may be performed at proportionate different safety levels as commercial air transport (CAT), non-commercial operations with complex motor-powered helicopters (NCC), other-than-complex motor-powered helicopters (NCO) and specialised operations (SPO).

### Current regulatory framework

#### Uneven implementation of regulations

The main issue is an uneven level playing field and consequently the increase in safety risks. The present OPS Regulation does not reflect current additional national requirements adapted to the North Sea environment, mainly from the United Kingdom and Norway, where the majority of helicopter offshore operations take place. Some Member States also issue a specific offshore approval to ensure appropriate oversight of those high risk operations. There is the risk that current EU rules may

<sup>10</sup> Opinion No 01/2012 'Air Operations — OPS (Part-NCC and Part-NCO)'.

<sup>11</sup> Opinion No 02/2012 'Air Operations — OPS (Part-SPO)'.



allow an operator to perform helicopter offshore operation in the North Sea without the relevant risk mitigation measures or appropriate oversight.

As already explained above, the implementation difficulties might also be linked to a different understanding of what 'offshore operations' means. Moreover, the different national interpretations may also find their source in the lack of common understanding on the link between a 'hostile environment' and an 'offshore operation'.

#### Rules for CAT helicopter offshore flights

CAT helicopter offshore operations within the Member States were not governed by a common regulatory framework under JAR-OPS 3. Norway and the United Kingdom, from which the majority of helicopter offshore operations are conducted, introduced additional national rules and conditions for CAT helicopter offshore operations based on best regulatory practices and industry standards, drawn from lessons learned from incidents and accidents over a considerable amount of years of operation.

In addition, Denmark, Ireland, Norway and the United Kingdom issue special approvals for offshore operations to ensure the fulfilment of safety standards. Denmark has an additional specific approval for operations in relation to Performance Class 2 Enhanced. While these national rules follow the same approach to ensure safety, they are not exactly the same; thus, not providing for a level playing field.

Commission Regulation (EU) No 965/2012 for CAT neither reflects any of the national rules or conditions nor does it incorporate a specific approval for offshore operations.

Paragraph 4 of Article 6 (Derogations) of the OPS Cover Regulation allows Member States to continue with national provisions under certain conditions. It is the objective of this rulemaking task to establish harmonised rules. This derogation will no longer be valid subsequent to this rulemaking task.

#### Rules for NCC helicopter offshore flights

Non-commercial flights to offshore destinations within the Member States were previously regulated (or not) or prohibited by national regulations. The Opinion<sup>12</sup> for EU regulations for NCC incorporates some operational procedures and equipment requirements. These requirements are proportionate meaning that the rules would allow flights to any offshore location at a lower safety level than CAT. The data assessed by the Agency indicates that approximately 3 % of the offshore operations are conducted as non-commercial operations. Based on the safety risk assessment matrix, new provisions are proposed.

#### Rules for SPO helicopter offshore flights

Aerial work flights to offshore destinations were previously regulated (or not) by national rules. The Opinion<sup>13</sup> for EU regulations for SPO regarding helicopter operations incorporates some operational procedures and equipment requirements. These requirements are proportionate meaning that the rules would allow flights to any offshore location at a lower safety level than CAT. Currently, SPO offshore operations are limited (2–5 % of

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<sup>12</sup> Opinion No 01/2012 'Air Operations — OPS (Part-NCC and Part-NCO)'.

<sup>13</sup> Opinion No 02/2012 'Air Operations — OPS (Part-SPO)'.

the total offshore flights as a rough estimate). Based on the safety risk assessment matrix, new provisions are proposed.

#### Summary of the issues

The safety risks may increase due to uneven implementation of Commission Regulation (EU) No 965/2012 and associated Opinions leading to an uneven playing field in relation to helicopter operations to offshore destinations. The following items need to be considered to ensure a safe level playing field with proportionate common European requirements:

- common definitions for offshore operations, offshore location, and hostile environment;
- harmonised requirements and means of oversight (specific approval).

#### **Who is affected?**

##### Number of offshore helicopters in Member States

Presently 242 helicopters are being used by 14 Member States. The area defined as 'Oil & gas/Offshore transfer' involves 214 helicopters from 10 Member States with Norway and the United Kingdom being the main players with 155 helicopters, followed by France and the Netherlands with 34 helicopters.

##### Number of CAT offshore helicopter operators

Information received from Member States regarding the number of CAT helicopter operators indicates that 6 Member States have a total of 14 CAT operators. Norway and the United Kingdom account for 10 out of the 14 CAT operators.

##### Offshore operations

There were 13.9 million person flight hours to/from oil & gas offshore locations in the United Kingdom and Norway for the period 1999–2009. Due to the fact that 88 % of the helicopter fleet is used for such operations, it can be estimated that the flight hours for oil & gas offshore operations represents approximately 90 % of the total flight hours. The remaining is estimated to be performed under aerial work rules and rules applicable to non-commercial operations.

##### NAAAs

Member States are responsible for certifying and ensuring overseeing certified operators as well as overseeing activities taking place in their territory.

#### **What are the safety risks?**

##### Risk and mitigation measures

Due to their design helicopters are potentially vulnerable to catastrophic mechanical failures because of the high number of single-load-path critical parts within the rotor and rotor drive systems and the reduced redundancy within their design. In addition, helicopter offshore operations are in general exposed to high risks when operating in hostile environment.

The most important and common contributing factors to risk reduction are;

- introduction of newest helicopter design and technology;
- introduction of SMS;
- use of FDM;
- use of VHM; and
- improved operational training of flight crew.

#### Frequency and severity of occurrences in the North Sea

Out of the 27 accidents involving helicopters in the North Sea in the period 1990–2009,

6 accidents were fatal<sup>14</sup>. The average number of fatalities per *fatal* accident was 10,3. The average accident rate in the North Sea for the period 1990–2009 was 0,91 accidents per million person flight hours. The rate varies between 0,38 for Norway and 1,33 for the United Kingdom. The average number of fatalities per accident was 2,3.

#### What are the safety risks with the baseline scenario?

The baseline scenario (Option 0 'Do nothing') means that as long as there are no specific European regulations, Member States can continue to introduce additional national requirements including a specific approval, or continue solely according to the CAT regulations. Risks identified by Accident Investigation Boards, safety studies related to the offshore environment and the risk matrix will not be mitigated evenly throughout Member States.

A possible scenario could be an operator with an AOC from a Member State solely following the EU CAT rules starting operations in a Member State where additional national safety requirements were introduced. This Member State would not have the possibility to require the operator to comply with its additional regulations. The operator would access this market with a lower investment and would increase the safety risk of the offshore employees/passengers as well as the helicopter crew.

A difference in safety standards would be created and a level playing field not be maintained.

### **Objectives**

The general objectives of the Basic Regulation are to establish and maintain a high uniform level of civil aviation safety in Europe. The additional objectives stated in the Basic Regulation are the promotion of cost-efficiency and level playing field in the regulatory and certification process. This proposal will contribute to the overall objectives.

The specific objectives of this proposal are:

- to ensure that the different types of operations (CAT, NCC and SPO) are safe;
- to ensure a level playing field among helicopter operators;
- to define offshore operations by taking into account the evolution in the business; and
- to ensure appropriate oversight by the regulators (NAAs) to support the safety objectives.

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<sup>14</sup> Helicopter Safety Study 3.

## Identification of options

A set of options were developed to meet the objectives:

<b>Option No</b>	<b>Description</b>
<b>0</b>	<b>Do nothing:</b> Operations may continue as governed by EU regulations, and Member States may continue to introduce additional national requirements including national specific approval for CAT.
<b>1</b>	<b>Rulemaking to adjust and update regulations to address the associated risks to offshore operations.</b>
<b>2</b>	<b>Option 1 and additionally to introduce a requirement for a specific approval for helicopter offshore operations</b>

### Option 1 – Minimum requirements for offshore operations

Option 1 provides a harmonised definition for hostile environment, offshore operations and offshore location.

It also clarifies and updates requirements such as 'Landing and take-off PC-2 procedures for CAT at offshore locations', operational procedures, training requirements and the minimum number of safety equipment to be installed or carried on helicopters for CAT, NCC and SPO offshore operations.

### Option 2 – Additional specific approval

A specific approval for operators performing CAT, NCC and SPO helicopter offshore operations is defined in option 2 to ensure that the minimum requirements are followed by the operators and appropriate oversight is ensured by competent authorities. Such proposal would reflect the current best practices of the major players in offshore operations for CAT, Denmark, Ireland, Norway and the United Kingdom. To the best knowledge of the Agency, such approval is not required for NCC and SPO operators. Though, it seems that some Member States require full compliance with CAT rules for any operator to fly offshore.

## Analysis of impacts

### Safety impact

With option 1, the minimum safety requirements are applicable to all operators. However, safety risks might remain if appropriate authority oversight is not assured by issuing a prior approval allowing the operation. Therefore, the safety impacts may vary between negative and positive.

With option 2, a specific approval for all types of operations will provide a higher certainty that the safety risks are mitigated and properly overseen.

### Social impact

#### Option 1

##### *CAT*

Operators from Member States with operations in the North Sea area are already operating according to these requirements: there is no change in the social conditions from the job quality's point of view. Operators from Member States that do not follow the requirements established for operations in the North Sea area would face an increase in standards. But as offshore operations are conducted at a limited scale outside the North Sea, the social impacts are considered to be limited accordingly.

##### *SPO*

Operations must also be performed according to stricter standards. Working conditions for pilots will change; the impact on more or less employment cannot be evaluated. However, in any case, salary, working hours and social benefits could be affected. The extent of operations is not precisely known, but as it is considered to be low, the social impact is considered also to be low.

##### *NCC*

NCC operations must be performed according to stricter standards. As there are only very few flights today, the impact is very limited.

#### Option 2

The specific approval will ensure that the draft rules are commonly implemented. Social concerns remain as in option 1.

### Economic impact

Options 1 and 2 would have an impact only on CAT operators of Member States which do not presently apply additional safety standards.

Most of the offshore operations are performed today as CAT operations in Member States having similar rules as the ones proposed with this NPA. The impact on the other Member States applying lower standards is limited due to the smaller extent of these operations.

It is not known whether SPO or non-commercial operators meet the safety standards of the draft rules. However, a general transition is foreseen to give time to operators to implement them.

Overall, the economic impact of these options is considered neutral for most of the major players in the North Sea area compared to their current national regulatory situation (more than 90 % of the helicopter offshore operations). For the CAT operators and the NAAs from other Member States there is a potentially negative economic impact which should be minimised by the transition periods provided for in the draft rules.

A certification system may bring some value to SPO operators as it could facilitate free movement. Nevertheless, stringent requirements are to be met. The impact for SPO is considered to be neutral to negative. For NCC operators the impact is negative.

Proportionality issues

Options 1 and 2 are proportionate to the safety risks occurring when a helicopter operator has to fly to/from an offshore location.

Impact on regulatory coordination and harmonisation

Option 1 will ensure common European requirements for all offshore operations. Nevertheless, this option is not fully in line with the Member States (where the majority of the offshore operations take place) which require a specific approval for some types of offshore operations.

Option 2 will ensure that the NAAs oversight is being conducted with a standard set of regulations. The confidence of an appropriate regulatory implementation is therefore reinforced with option 2. This is in line with the MS practice where the majority of offshore operations take place.

**Conclusion and preferred option**Overall impacts per type and per option

<i>Types of impact</i>	<i>Option 0</i>	<i>Option 1</i>	<i>Option 2</i>
Safety	–	–/+	+
Social	–	–/+	–/+
Economic	+	–/0	–/0
Proportionality	–	–	–
Regulatory coordination and harmonisation	–	+	+
<b>Overall impacts</b>	<b>–</b>	<b>–/0</b>	<b>0/+</b>

Preferred option

Option 2 'Rulemaking to adjust and update regulations to address the associated risks to offshore operations and additionally to introduce a requirement for a specific approval' will ensure that the current high safety level achieved by the Member States where most of the offshore operations take place is maintained. Overall, option 2 ensures safety with a proportionate approach.

**VII. How to comment on this NPA**

37. Comments to this NPA, including the answers to the 5 specific questions mentioned above, shall be submitted to the Agency within 3 months according to Article 6.4 of the Rulemaking Procedure.
38. Please submit your comments using the **automated Comment-Response Tool (CRT)** available at <http://hub.easa.europa.eu/crt/><sup>15</sup>.
39. The deadline for the submission of comments is **6 September 2013**.

<sup>15</sup> In case the use of the Comment-Response Tool is prevented by technical problems please report them to the CRT webmaster ([crt@easa.europa.eu](mailto:crt@easa.europa.eu)).

## B. Draft Opinion and Decision

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

1. Deleted text is shown with a strike through: ~~deleted~~
2. New text is highlighted with grey shading: **new**
3. An ellipsis (...) indicates that the remaining text is unchanged in front of or following the reflected amendment.

## I. Draft Opinion for a Commission Regulation (EU) No .../... amending Commission Regulation (EU) No 965/2012 of 25 October 2012

### (a) Amendment to the Cover Regulation

#### (1) Article 5 'Air operations'.

In paragraph 2 a new subparagraph (g) is included:

**(g) helicopters used for offshore operations (HOFO).**

#### (2) Article 6 'Derogations'.

Paragraph 4 is deleted:

~~Notwithstanding Article 5, Member States may continue to require a specific approval and additional requirements regarding operational procedures, equipment, crew qualification and training for CAT helicopter offshore operations in accordance with their national law. Member States shall notify the Commission and the Agency of the additional requirements being applied to such specific approvals. These requirements shall not be less restrictive than those of Annexes III and IV.~~

#### (3) In addition, the amending Regulation to Commission Regulation (EU) No 965/2012 should include the following entry into force requirement.

~~'This Regulation shall enter into force on the 20<sup>th</sup> day following that of its publication in the Official Journal of the European Union.~~

~~It shall apply from [1 year after entry into force]. '~~

### (b) Amendment to Annex I (Definitions for terms used in Annexes II–VIII<sup>16</sup>)

#### (1) The definition of 'hostile environment' is amended as follows:

**(66) 'hostile environment' means:**

**(a) an environment in which:**

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

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

<sup>16</sup> Current status when publishing this NPA being Annexes I to V only; Annexes VI, VII and VIII are expected to be implemented in an updated version of Commission Regulation (EU) No 965/2012 prior to the possible introduction of Subpart K to Annex V.

- (iii) search and rescue response/capability is not provided consistent with anticipated exposure; or
  - (iv) there is an unacceptable risk of endangering persons or property on the ground.
- (b) in any case, the following areas:
  - (i) for overwater operations, the open sea areas north of 45N and south of 45S designated by the authority in the State concerned;
  - (ii) those part of a congested area without adequate safe forced landing areas.
- (2) The following definition is inserted:
 

(84) 'Offshore location' means a location or destination on a fixed or floating offshore structure or vessel, and includes helidecks, helicopter hoist operations areas and operating sites.
- (3) The definition of 'offshore operations' is amended as follows:
 

(83)(85) 'Offshore operations' means ~~operations which routinely have a substantial proportion of the flight conducted over sea areas to or from offshore locations.~~ a helicopter operation that has a substantial proportion of any flight conducted over open sea areas to or from an offshore location for the purpose of:

  - (a) support to offshore oil, gas and mineral exploration, production, storage and transport;
  - (b) support to offshore wind turbine and other renewable energy sources;
  - (c) support to marine lights; or
  - (d) sea-pilot transfer.
- (c) Amendments to Annex II (Part-ARO Authority Requirements for Air Operations)
  - (1) Appendix II 'Operations Specifications'.
 

A new line in the Operator Specifications is inserted below 'Helicopter emergency medical service operations' as follows:

**Helicopter offshore operations**
  - (2) Appendix V<sup>17</sup> 'List of specific approvals'.
 

In footnote no. 10 include HOFO as the last acronym as follows:

List in this column any approved operations, e.g., Dangerous goods, LVO, RVSM, RNP, MNPS, NVIS, HHO, **HOFO**.
- (d) Amendments to Annex IV (CAT), Subpart B, Section 1<sup>18</sup>
  - (1) Paragraph CAT.OP.MPA.120 is deleted.
  - (2) Paragraph CAT.OP.MPA.181 is amended as follows:

<sup>17</sup> Appendix V to Annex II is expected to be published prior to the possible introduction of Subpart K to Annex V with amending Regulation introducing non-commercial operations to Commission Regulation (EU) No 965/2012.

<sup>18</sup> Deleted paragraphs or parts of paragraphs are transferred to Annex V, Subpart K.



Subparagraph (b)(1) and the entire subparagraph (d) are deleted.

Subparagraphs (b)(2), (b)(3) and (e) are renumbered (b)(1), (b)(2) and (d) respectively.

- (3) Paragraph CAT.OP.MPA.247 is amended as follows:

Subparagraph (b) is deleted.

- (4) Paragraph CAT.IDE.H.280 is amended as follows:

Subparagraph (b) is deleted.

Subparagraph (c) is renumbered (b).

- (5) Paragraph CAT.IDE.H.295 is amended as follows:

Subparagraph (a) is deleted.

- (6) Paragraph CAT.IDE.H.310 is deleted.

- (e) Amendments to Annex V (Part-SPA Specific Approvals)

A new Subpart K is inserted:

### **Subpart K — Helicopter offshore operations (HOFO)**

#### **SPA.HOFO.100 Helicopter offshore operations**

- (a) Helicopters shall only be operated for the purpose of offshore operations if the operator has been approved by the competent authority.

- (b) To obtain such approval by the competent authority, the operator shall demonstrate compliance with the requirements of this Subpart and shall comply with one of the following:

(1) shall be a CAT operator holding a valid AOC in accordance with Part-ORO and Part-CAT;

(2) shall be a non-commercial operator of a complex motor-powered helicopter having declared its activity in accordance with Part-ORO and Part-NCC; or

(3) shall be a specialised operator having shown compliance with Part-ORO and Part-SPO, as applicable.

- (c) The operator shall identify and evaluate aviation safety hazards entailed by its activities. The operator shall manage the associated risks appropriately by identifying and implementing mitigating measures. The operator shall verify the effectiveness of those mitigating measures.

#### **SPA.HOFO.105 Operating procedures**

- (a) The operator shall establish procedures and instructions for normal and abnormal operations and including emergency procedures to be used for HOFO. These procedures and instructions shall be included in the operations manual or the procedure manual and contain the duties and responsibilities of

crew members and other personnel involved in offshore operations.

(b) The operator shall ensure that:

- (1) an operational flight plan is prepared prior to each flight;
- (2) passengers have received a safety briefing that also includes offshore related items prior to boarding the helicopter;
- (3) when the weather report or forecasts available to the pilot-in-command/commander indicate that the sea temperature will be less than plus 10 °C during the flight, or when the estimated rescue time exceeds the calculated survival time, or the flight is planned to be conducted at night, the crew wears a survival suit<sup>19</sup>;
- (4) the offshore route structure provided by appropriate ATS is used or, if not established, appropriate lateral and vertical separation from other aircraft is maintained;
- (5) the highest possible mode of the automatic flight control systems (AFCS) is used throughout the flight;
- (6) specific offshore approach profiles are established, including stable approach parameters and the corrective action to be taken if an approach becomes unstable;
- (7) a member of the flight crew monitors the flight instruments during the approach to ensure that a safe flight path is maintained; and
- (8) the flight crew takes immediate or appropriate action when a height warning is activated.

#### **SPA.HOFO.110 Use of offshore locations**

The operator shall only use offshore locations that are adequate for the helicopter operated in relation to size, facilities, lighting, fire fighting, and manning.

#### **SPA.HOFO.115 Selection of aerodromes and operating sites<sup>20</sup>**

##### **ONSHORE DESTINATION ALTERNATE AERODROME**

Notwithstanding CAT.OP.MPA.181, NCC.OP.152, and SPO.OP.151, the pilot-in-command/commander does not need to specify a destination alternate aerodrome in the operational flight plan when conducting flights from an offshore location to a land destination being defined as a coastal aerodrome.

<sup>19</sup> Transposed from CAT.IDE.H.295, subparagraph (a).

<sup>20</sup> Transposed from CAT.OP.MPA.181, subparagraphs (b)(1) and (b)(2).

**OFFSHORE DESTINATION ALTERNATE AERODROME**

- (a) An offshore destination alternate aerodrome shall be used only after the point of no return (PNR). Prior to the PNR an onshore alternate aerodrome shall be used
- (b) If the operator selects to use an offshore destination alternate aerodrome, the following criteria shall be taken into account:
  - (1) one engine inoperative (OEI) landing capability performance at the offshore destination alternate aerodrome;
  - (2) weather minima taking into account accuracy and reliability of meteorological information;
  - (3) assessment of the suitability of the offshore destination alternate aerodrome under the expected conditions;
  - (4) helideck availability shall be guaranteed prior to PNR; and
  - (5) the MEL shall contain specific provisions for this type of operation.

**SPA.HOFO.120 Flight data monitoring (FDM) programme**

- (a) Whenever operating a helicopter equipped with a flight data recorder in commercial air transport operations, the operator shall establish and maintain a flight data monitoring system which shall be integrated in its management system.
- (b) The flight data monitoring system shall be non-punitive and contain adequate safeguards to protect the source(s) of the data.

**SPA.HOFO.125 Flight following system**

A commercial air transport operator or specialised operator shall have available a monitored flight following system for offshore operations in a hostile environment from the time the helicopter departs until it arrives at its final destination.

**SPA.HOFO.130 Airborne radar approaches (ARAs) to offshore locations<sup>21</sup> — CAT operations**

- (a) A CAT operator shall only undertake an ARA if:
  - (1) the radar provides course guidance to ensure obstacle clearance; and
  - (2) either:
    - (i) the minimum descent height (MDH) is determined from a radio altimeter; or
    - (ii) the minimum descent altitude (MDA) plus an adequate margin is applied.
- (b) ARAs to rigs or vessels in transit shall only be conducted in multi-crew CAT operations.

<sup>21</sup> Transposed from CAT.OP.MPA.120.

- (c) The decision range shall provide adequate obstacle clearance in the missed approach from any destination for which an ARA is planned.
- (d) The approach shall only be continued beyond decision range or below the minimum descend altitude/height (MDA/H) when visual reference with the destination has been established.
- (e) For single-pilot CAT operations, appropriate increments shall be added to the MDA/H and decision range.

#### **SPA.HOFO.135 Meteorological conditions<sup>22</sup>**

Notwithstanding CAT.OP.MPA.247, NCC.OP.180 and SPO.OP.170, when flying between offshore locations located in class G airspace where the overwater sector is less than 10 NM, VFR flights may be conducted when the limits are at, or better than, the following:

<b>Minima for flying between offshore locations located in class G airspace</b>				
	<b>Day</b>		<b>Night</b>	
	<b>Height *</b>	<b>Visibility</b>	<b>Height *</b>	<b>Visibility</b>
Single pilot	300 ft	3 km	500 ft	5 km
Two pilots	300 ft	2 km**	500 ft	5 km***

\* The cloud base shall allow flight at the specified height, below and clear of cloud.

\*\* Helicopters may be operated in flight visibility down to 800 m provided the destination or an intermediate structure is continuously visible.

\*\*\* Helicopters may be operated in flight visibility down to 1 500 m provided the destination or an intermediate structure are continuously visible.

#### **SPA.HOFO.140 Wind limitations for operations to offshore locations<sup>23</sup>**

Flight to an offshore location shall only be operated when the mean wind speed at the helideck is reported to be less than 60 kt.

#### **SPA.HOFO.145 Performance requirements — take-off and landing at offshore locations**

Helicopters taking off and landing at offshore locations shall be operated in accordance with the performance requirements of Annex IV (Part-CAT), Subpart C, Section 2, and comply with the requirements for operations without an assured safe forced landing capability.

<sup>22</sup> Transposed from CAT.OP.MPA.247, subparagraph (b).

<sup>23</sup> Transposed from CAT.OP.MPA.247, subparagraph (c).

**SPA.HOFO.150 Equipment requirements**

(a) The operator shall comply with the following equipment requirements:

(1) Public address (PA) system

(i) Helicopters used for CAT or NCC operations shall be equipped with a public address (PA) system.

(ii) Helicopters with an MOPSC of nine or less may not need to equip the helicopter with a PA system if the operator can demonstrate that the pilot's voice is understandable at all passengers' seats in flight.

(2) Radio altimeter

Helicopters used for NCC or SPO operations shall be equipped with a radio altimeter capable of emitting an audio warning below a preset height and a visual warning at a height selectable by the pilot.

(3) Airborne weather detecting equipment

Other than complex motor-powered helicopters used for SPO operations shall be equipped with airborne weather detecting equipment in accordance with SPO.IDE.H.132.

(b) Emergency lighting and marking

All emergency exits, including crew emergency exits, and the means for opening them shall be clearly marked for the guidance of occupants using the exits in daylight or in the dark. Such markings shall be designed to remain visible if the helicopter is capsized or the cabin is submerged.

**SPA.HOFO.155 Additional equipment for operations in a hostile environment<sup>24</sup>**

(a) Life jackets

Life jackets shall be worn at all times by all on board unless integrated survival suits that meet the combined requirement of the survival suit and life jacket are worn.

(b) Life rafts

All life rafts carried shall be installed so as to be usable in the sea conditions in which the helicopter's ditching, flotation, and trim characteristics were evaluated for certification.

(c) Emergency cabin lighting

The helicopter shall be equipped with an emergency lighting system with an independent power supply to provide a source of general cabin illumination to facilitate the evacuation of the helicopter.

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<sup>24</sup> Transposed from CAT.IDE.H.310.

**(d) Emergency locator transmitter (ELT)**

The helicopter shall be equipped with an automatically deployable ELT (ELT(AD)) capable of transmitting simultaneously on 121,5 and 406 MHz.

**(e) Securing of non-jettisonable doors**

Non-jettisonable doors that are designated as ditching emergency exits shall have a means of securing them in the open position so that they do not interfere with the occupants' egress in all sea conditions up to the maximum required to be evaluated for ditching and flotation.

**(f) Opening escape hatches**

All doors, windows or other openings in the passenger compartment assessed as suitable for the purpose of underwater escape shall be equipped so as to be operable in an emergency.

**SPA.HOFO.160 Vibration health monitoring system**

(a) The following helicopters operating in a hostile environment in commercial air transport operations shall be fitted with a vibration health monitoring (VHM) system capable of monitoring the status of critical rotor and rotor drive systems:

- (1) helicopters first issued with an individual Certificate of Airworthiness (CoA) after 31 December 2015; and
- (2) helicopters first issued with an individual CoA before 1 January 2016 by 1 January 2018.

(b) The operator shall have a system to:

- (1) collect the data including system generated alerts;
- (2) analyse and determine component serviceability; and
- (3) respond to detected incipient failures.

**SPA.HOFO.165 Crew requirements**

(a) The operator shall establish:

- (1) criteria for the selection of flight crew members, taking into account previous experience;
- (2) a minimum experience level for a commander/pilot-in-command intending to conduct offshore operations; and
- (3) a flight crew training and checking programme that each flight crew member shall complete successfully. Such programme shall be adapted to the offshore environment and include normal, abnormal and emergency procedures, crew resource management and water entry and sea survival training.
- (4) A commander/pilot-in-command conducting offshore operations shall fly at least once in this role in an offshore environment each 28 days.
- (5) A commander/pilot-in-command not meeting this recency requirement shall undergo a training programme established by the operator to re-establish recency.

## (f) Amendments to Annex VI (Part-NCC)

- (1) Paragraph NCC.OP.152 Destination alternate aerodromes — helicopters, is amended as follows:  
Subparagraph (b)(3) is deleted.
- (2) Paragraph NCC.IDE.H.215 Emergency locator transmitter (ELT), is amended as follows:  
Subparagraph (b) is deleted.
- (3) Paragraph NCC.IDE.H.226 Crew survival suits, is amended as follows:  
Subparagraph (a) is deleted.
- (4) Paragraph NCC.IDE.H.231 Additional requirements for helicopters conducting offshore operations in a hostile sea area, is deleted.

## (g) Amendments to Annex VIII (Part-SPO)

- (1) Paragraph SPO.OP.151 Destination alternate aerodromes — helicopters, is amended as follows:  
Subparagraph (b)(3) is deleted.
- (2) Paragraph SPO.IDE.H.198 Survival suits — complex motor-powered helicopters, is amended as follows:  
Subparagraph (a) is deleted.

Paragraph SPO.IDE.H.201 Additional requirements for helicopters conducting offshore operations in a hostile sea area — complex motor-powered helicopters, are deleted.

**II. Draft Decision amending Decisions 2012/016/R, 2012/018/R and 2012/019/R of the Executive Director of the European Aviation Safety Agency of 24 and 25 October 2012 on air operations**

(a) Amendment of AMC/GM to Annex II, Part-ARO

- (1) A new AMC3 ARO.OPS.200 is added as follows:

**AMC3 ARO.OPS.200 Specific approval procedure**

**APPROVAL OF HELICOPTER OFFSHORE OPERATIONS**

(a) Approval

When verifying compliance with the applicable requirements of Subpart K of Annex V to Part-SPA, the competent authority should verify prior to issuing an approval that:

- (1) the hazard identification and risk mitigation process is in place;
- (2) operating procedures have been established;
- (3) helicopters are appropriately equipped;
- (4) flight crew involved in these operations is trained and checked in accordance with the training and checking programmes established by the operator; and
- (5) all requirements of Part-SPA Subpart K are met.

(b) Demonstration flight(s)

The final step of the approval process may require a demonstration flight. The competent authority may appoint an inspector for a flight to verify that all relevant procedures are applied effectively. If the performance is satisfactory, helicopter offshore operations may be approved.

**GM1 ARO.OPS.200 Specific approval procedure**

**APPROVAL OF HELICOPTER OFFSHORE OPERATIONS**

The approval of operations without an assured safe forced landing capability should be an integral part of the offshore operations approval and not be understood as separate approval.

(b) Amendment of AMC and GM to Annex IV Part-CAT<sup>25</sup>

- (1) AMC2 CAT.OP.MPA.105 is deleted.
- (2) AMC1 CAT.OP.MPA.120 is deleted.
- (3) GM1 CAT.OP.MPA.120 is deleted.
- (4) AMC1 CAT.OP.MPA.181(b)(1) is deleted.
- (5) AMC1 CAT.OP.MPA.181(d) is deleted.
- (6) GM1 CAT.OP.MPA.181 is amended as follows:

Text under the heading OFFSHORE ALTERNATES is deleted.

<sup>25</sup> Deleted AMC and GM are transferred to Part-SPA, Subpart K.



- (7) A new AMC1 CAT.POL.H.305(a) is added as follows:

**AMC1 CAT.POL.H.305(a) Operations without an assured safe forced landing capability**

**VALIDITY OF RISK ASSESSMENT**

The operator should ensure that the conditions pertaining to the granting of the approval and the associated risk assessment remain valid for the type of operations being conducted.

- (8) A new AMC1 CAT.POL.H.310(c)(2) & CAT.POL.H.325(c)(2) is added as follows:

**AMC1 CAT.POL.H.310(c)(2) Take-off & CAT.POL.H.325(c)(2) Landing**

**FACTORS**

- (a) To ensure that the necessary factors are taken into account, the operator should:

- (1) use take-off and landing procedures that are appropriate to the circumstances, and that minimise the risks of collision with obstacles and the deck edge;
- (2) use Aircraft Flight Manual planning data that show take-off and landing masses which take into account drop-down and take-off deck edge miss, in varying conditions of pressure altitude, temperature, and wind.

- (b) Replanning of offshore location take-off or landing masses during the flight is acceptable, subject to procedures being established in the operations manual. These procedures should be simple and safe to carry out, with no significant increase in crew workload during critical phases of flight.

- (9) A new AMC2 CAT.IDE.H.145 is added as follows:

**AMC2 CAT.IDE.H.145 Radio altimeters**

**RADIO ALTIMETER DISPLAY**

The height display should include an analogue presentation and not solely a digital presentation.

- (10) A new GM1 CAT.IDE.H.145 is added as follows:

**AMC3 CAT.IDE.H.145 Radio altimeters**

**AUDIO VOICE ALERTING DEVICE**

- (a) To be effective the voice warning alert should be distinguishable from other warnings and should contain a clear and concise voice message.
- (b) The warning format should meet the following conditions:
- (1) the warning should be unique (i.e. voice);

- (2) it should not be inhibited by any other audio warnings;
  - (3) the urgency of the warning should be adequate to draw attention but not such as to cause undue annoyance during deliberate descents through the datum height.
- (c) The characteristics above can be satisfactorily met if the warning format incorporates all of the following features:
- (1) a unique tone should precede the voice message. A further tone after the voice may enhance uniqueness and attention-getting without causing undue annoyance;
  - (2) the perceived urgency of the tone and voice should be moderately urgent;
  - (3) the message should be compact as opposed to lengthy, provided the meaning is not compromised, e.g. 'One fifty feet' as opposed to 'One hundred and fifty feet';
  - (4) an information message is preferable (e.g. 'One hundred feet'). Messages such as 'Low height' do not convey the correct impression during deliberate descents through the datum height;
  - (5) command messages (e.g. 'Pull up, pull up') should not be used unless they relate specifically to height monitoring (e.g. 'Check height');
  - (6) the volume of the warning should be adequate and not variable below an acceptable minimum value.
- (d) Every effort should be made to prevent spurious warnings.
- (e) The height at which the audio warning is triggered by the radio altimeter should be such as to provide adequate warning for the pilot to take corrective action. It is envisaged that most installations will adopt a height in the range of 100–160 ft. The datum will not be adjustable in flight.
- (f) The pre-set height should not be set such that it will coincide with commonly used instrument approach minima (i.e. 200 ft). Once triggered, the message should sound within 0.5 seconds.
- (g) The voice warning should be triggered only whilst descending through the pre-set height and be inhibited whilst ascending.

- (c) New AMC and GM to Annex V Part-SPA, Subpart K is added as follows:

**AMC1 SPA.HOFO.100(c) Helicopter offshore operations**

**RISK ASSESSMENT**

- (a) The operator's risk assessment should include, but not be limited to, the following hazards:

- (1) collision with windmills;
- (2) collision with sky sails;
- (3) collision during low level IMC operations;
- (4) IMC or night offshore approaches;
- (5) loss of control during operations to small or moving offshore locations.

- (b) For IMC or night offshore approaches, the following mitigating measures may be considered:

- (1) multi crew operation;
- (2) establishment of flight crew minimum experience requirements;
- (3) the status and lighting of the offshore location is available to the flight crew to determine operational limitations;
- (4) minimum weather conditions for nights operations; and
- (5) minimum wind speed, maximum crosswind and maximum wind variation.

**AMC1 SPA.HOFO.105(b)(1) Operating procedures**

**OPERATIONAL FLIGHT PLAN**

The operational flight plan should contain at least the items listed in AMC1 CAT.OP.MPA.175(a) Flight preparation.

**AMC1 SPA.HOFO.105(b)(2) Operating procedures**

**PASSENGER BRIEFING**

The following aspects applicable to the helicopter used should be presented by audio-visual electronic means (video, DVD or similar) or demonstrated by a crew member prior to boarding the aircraft for onshore and offshore legs:

- (a) demonstration of the use of the life jackets and where they are stowed;
- (b) demonstration of the proper use of survival suits, including briefing on the need to have suits fully zipped with hoods and gloves on during take-off and landing or otherwise advised by the pilot-in-command/commander;

- (c) information on the location of the emergency exits and demonstration of their use;
- (d) demonstration of life raft deployment and boarding;
- (e) demonstration of deployment of all survival equipment; and
- (f) boarding and disembarkation instructions.

#### **AMC1 SPA.HOFO.110 Use of offshore locations<sup>26</sup>**

##### **GENERAL**

- (a) The content of the operations manual relating to the specific usage of offshore locations (Part C for CAT operators) should contain both the listing of helideck limitations in a helideck limitations list (HLL) and a pictorial representation (template) of each offshore location and its helideck showing all necessary information of a permanent nature. The HLL should show, and be amended as necessary to indicate, the most recent status of each helideck concerning non-compliance with ICAO Annex 14, Volume 2, limitations, warnings, cautions or other comments of operational importance. An example of a typical template is shown in figure 1 of GM1 SPA.HOFO.110.
- (b) In order to ensure that the safety of flights is not compromised the operator should obtain relevant information and details for compilation of the HLL, and the pictorial representation, from the owner/operator of the offshore location.
- (c) If more than one name of the offshore location exists, the most common name should be listed, but other names should also be included in the HLL. After renaming an offshore location, the old name should be included in the HLL for the ensuing 6 months.
- (d) All limitations should be included in the HLL. Offshore locations without limitations should also be listed. With complex installations and combinations of installations (e.g. co-locations), a separate listing in the HLL, accompanied by diagrams where necessary, may be required.
- (e) Each offshore location should be assessed based on limitations, warnings, cautions or comments to determine its acceptability with respect to the following that, as a minimum, should cover the factors listed below:
  - (1) The physical characteristics of the helideck.
  - (2) The preservation of obstacle-protected surfaces is the most basic safeguard for all flights.  
 These surfaces are:
    - (i) the minimum 210° obstacle-free surface (OFS);
    - (ii) the 150° limited obstacle surface (LOS); and
    - (iii) the minimum 180° falling '5:1' gradient with respect to significant obstacles. If this is infringed or if an adjacent installation or vessel infringes the obstacle clearance surfaces or criteria related to a helideck, an assessment should be made to determine any

<sup>26</sup> Transferred from AMC2 CAT.OP.MPA.105.

possible negative effect that may lead to operating restrictions.

- (3) Marking and lighting:
  - (i) adequate perimeter lighting;
  - (ii) adequate floodlighting;
  - (iii) status lights (for night and day operations, e.g. signalling lamp);
  - (iv) dominant obstacle paint schemes and lighting;
  - (v) helideck markings; and
  - (vi) general installation lighting levels. Any limitations in this respect should be annotated 'daylight only operations' on the HLL.
- (4) Deck surface:
  - (i) surface friction;
  - (ii) helideck net;
  - (iii) drainage system;
  - (iv) deck edge netting;
  - (v) tie-down system; and
  - (vi) cleaning of all contaminants.
- (5) Environment:
  - (i) foreign object damage;
  - (ii) physical turbulence generators;
  - (iii) bird control;
  - (iv) air quality degradation due to exhaust emissions, hot gas vents or cold gas vents; and
  - (v) adjacent offshore installations may need to be included in air quality assessment.
- (6) Rescue and firefighting:
  - (i) primary and complementary media types, quantities, capacity and systems, personal protective equipment and clothing, breathing apparatus; and
  - (ii) crash box.
- (7) Communications and navigation:
  - (i) aeronautical radio(s);
  - (ii) radio-telephone (R/T) call sign to match offshore location name and side identification which should be simple and unique;
  - (iii) non-directional beacon (NDB) or equivalent (as appropriate);
  - (iv) radio log; and
  - (v) light signal (e.g. signalling lamp).
- (8) Fuelling facilities:

In accordance with the relevant national guidance and regulations.

(9) Additional operational and handling equipment:

- (i) windsock;
- (ii) wind recording;
- (iii) deck motion recording and reporting where applicable;
- (iv) passenger briefing system;
- (v) chocks;
- (vi) tie-downs; and
- (vii) weighing scales.

(10) Personnel:

Trained helideck staff (e.g. helicopter landing officer/helicopter deck assistant and fire-fighters, etc.).

- (f) For offshore locations on which there is incomplete information, 'limited' usage based on the information available may be specified by the operator prior to the first helicopter visit. During subsequent operations, and before any limit on usage is lifted, information should be gathered and the following should apply:

(1) Pictorial (static) representation:

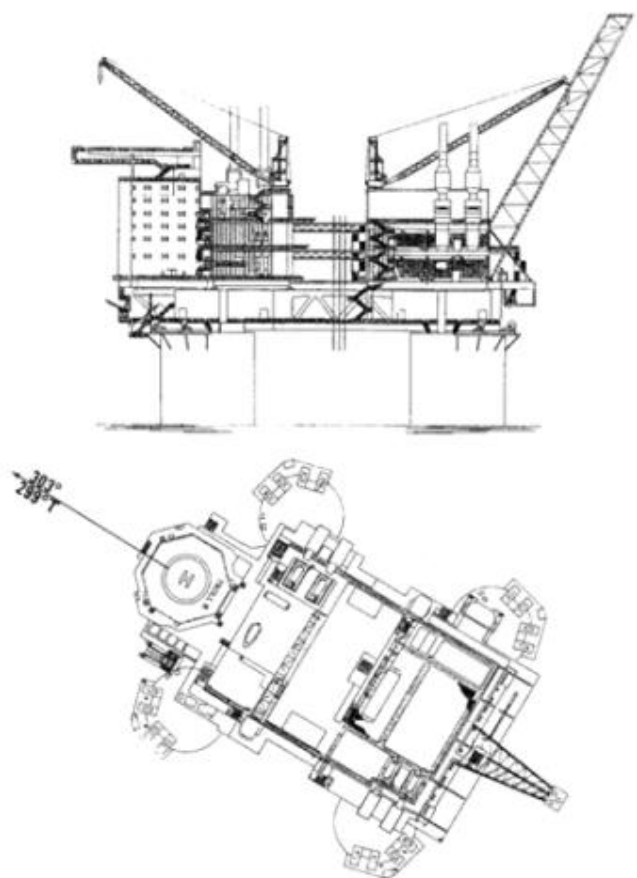
- (i) template (see GM1 SPA.HOFO.110) blanks should be available to be filled in during flight preparation on the basis of the information given by the offshore location owner/operator and flight crew observations;
- (ii) where possible, suitably annotated photographs may be used until the HLL and template have been completed;
- (iii) until the HLL and template have been completed, operational restrictions (e.g. performance, routing, etc.) may be applied;
- (iv) any previous inspection reports should be obtained by the operator; and
- (v) an inspection of the offshore location should be carried out to verify the content of the completed HLL and template, according to which the helideck may be considered fully adequate for operations.

(2) With reference to the above, the HLL should contain at least the following:

- (i) HLL revision date and number;
- (ii) generic list of helideck motion limitations;
- (iii) name of offshore location;
- (iv) 'D' value; and
- (v) limitations, warnings, cautions and comments.

- (3) The template should contain at least the following (see GM1 SPA.HOFO.110):
- (i) name of offshore location ;
  - (ii) R/T call sign;
  - (iii) helideck identification marking;
  - (iv) side panel identification marking;
  - (v) helideck elevation;
  - (vi) maximum installation/vessel height;
  - (vii) 'D' value;
  - (viii) type of offshore location:
    - (A) fixed manned,
    - (B) fixed unmanned,
    - (C) ship type (e.g. diving support vessel),
    - (D) semi-submersible,
    - (E) jack-up;
  - (ix) name of owner/operator;
  - (x) geographical position;
  - (xi) communication and navigation (Com/Nav) frequencies and identification;
  - (xii) general drawing of the offshore location showing the helideck with annotations showing location of derrick, masts, cranes, flare stack, turbine and gas exhausts, side identification panels, windsock, etc.;
  - (xiii) plan view drawing, chart orientation from the general drawing, to show the above. The plan view will also show the 210 orientation in degrees true;
  - (xiv) type of fuelling:
    - (A) pressure and gravity,
    - (B) pressure only,
    - (C) gravity only,
    - (D) none;
  - (xv) type and nature of firefighting equipment;
  - (xvi) availability of ground power unit (GPU);
  - (xvii) deck heading;
  - (xviii) maximum allowable mass;
  - (xix) status light (Yes/No); and
  - (xx) revision date of publication.

**GM1 SPA.HOFO.110 Use of offshore locations <sup>27</sup>**  
 HELIDECK TEMPLATE

<b>Installation/vessel name</b>		R/T call sign: ...	Helideck identification: ...	
Helideck elevation: xxx ft		Maximum height: xxx ft	Side identification: ...	
Type of installation: ... <sup>1</sup>			D value: .. m	
Position: <sup>2</sup> N ... W ...			Operator <sup>3</sup>	
			ATIS: VHF 123.45	
COM	LOG: VHF 123.45	NAV	NBD: 123 (ident)	
	Traffic: VHF 123.45		DME: 123	
	Deck: VHF 123.45		VOR/DME: 123	
			VOR: 123	
				
Fuelling: ... <sup>4</sup>		GPU: ... <sup>5</sup>		Deck heading: ...
MTOM: ... T		Status light: ... <sup>6</sup>		Firefighting equipment: ... <sup>7</sup>
				Revision date: ...

<sup>27</sup> Transferred from AMC2 CAT.OP.MPA.105.



- <sup>1</sup> Fixed manned, fixed unmanned; ship type (e.g. diving support vessel); semi-submersible; jack-up.
- <sup>2</sup> Latitude and longitude.
- <sup>3</sup> Name of operator of the installation
- <sup>4</sup> Pressure/gravity; pressure; gravity; no.
- <sup>5</sup> Yes; no; 28V DC.
- <sup>6</sup> Yes; no.
- <sup>7</sup> Type (e.g. aqueous film forming foams (AFFF)) and nature (e.g. deck integrated firefighting system (DIFFS)).

### **AMC1 SPA.HOFO.115 Selection of aerodromes and operating sites<sup>28</sup>**

#### **COASTAL AERODROME**

- (a) Any alleviation from the requirement to select an alternate aerodrome for a flight to a coastal aerodrome under IFR routing from offshore should be based on an individual safety case assessment.
- (b) The following should be taken into account:
  - (1) suitability of the weather based on the landing forecast for the destination;
  - (2) the fuel required to meet the IFR requirements of CAT.OP.MPA.150, NCC.OP.131 and SPO.OP.131 except for the alternate fuel;
  - (3) where the destination coastal aerodrome is not directly on the coast it should be:
    - (i) within a distance that, with the fuel specified in (b)(2), the helicopter can, at any time after crossing the coastline, return to the coast, descend safely and carry out a visual approach and landing with VFR fuel reserves intact; and
    - (ii) geographically sited so that the helicopter can, within the rules of the air, and within the landing forecast:
      - (A) proceed inbound from the coast at 500 ft AGL and carry out a visual approach and landing; or
      - (B) proceed inbound from the coast on an agreed route and carry out a visual approach and landing;
  - (4) procedures for coastal aerodromes should be based on a landing forecast no worse than:
    - (i) by day, a cloud base of DH/MDH + 400 ft, and a visibility of 4 km, or, if descent over the sea is intended, a cloud base of 600 ft and a visibility of 4 km; or
    - (ii) by night, a cloud base of 1 000 ft and a visibility of 5 km;

<sup>28</sup> Transferred from AMC1 CAT.OP.MPA.181(b)(1).

- (5) the descent to establish visual contact with the surface should take place over the sea or as part of the instrument approach;
- (6) routings and procedures for coastal aerodromes nominated as such should be included in the operations manual (Part C for CAT operators);
- (7) the MEL should reflect the requirement for airborne radar and radio altimeter for this type of operation; and
- (8) operational limitations for each coastal aerodrome should be specified in the operations manual.

**AMC2 SPA.HOFO.115 Selection of aerodromes and operating sites<sup>29</sup>**

**OFFSHORE DESTINATION ALTERNATE AERODROME**

Aerodrome is referred to as helideck in this AMC.

**(a) Offshore destination alternate helideck landing environment**

The landing environment at an offshore location proposed for use as an offshore destination alternate helideck should be pre-surveyed as well as the physical characteristics such as the effect of wind direction and strength, and turbulence established. This information, which should be available to the pilot-in-command/commander at the planning stage and in flight, should be published in an appropriate form in the operations manual (including the orientation of the helideck) so that the suitability of the alternate helideck can be assessed. It should meet the criteria for size and obstacle clearance appropriate to the performance requirements of the type of helicopter concerned.

**(b) Performance considerations**

The use of an offshore destination alternate helideck is restricted to helicopters which can achieve OEI in ground effect (IGE) hover at an appropriate power rating above the helideck at the offshore location. Where the surface of the helideck or prevailing conditions (especially wind velocity), precludes an OEI IGE, OEI out-of-ground effect (OGE) hover performance at an appropriate power rating should be used to compute the landing mass. The landing mass should be calculated from graphs provided in the operations manual (Part B for CAT operators). When arriving at this landing mass, due account should be taken of helicopter configuration, environmental conditions and the operation of systems that have an adverse effect on performance. The planned landing mass of the helicopter including crew, passengers, baggage, cargo plus 30 minutes final reserve fuel, should not exceed the OEI landing mass at the time of approach to the offshore destination alternate.

**(c) Weather considerations**

**(1) Meteorological observations**

<sup>29</sup> Transferred from AMC1 CAT.OP.MPA.181(d).

When the use of an offshore destination alternate helideck is planned, the meteorological observations both at the offshore destination and alternate should be taken by an observer acceptable to the authority responsible for the provision of meteorological services. Automatic meteorological observation stations may be used.

(2) Weather minima

When the use of an offshore destination alternate helideck is planned, the operator should neither select an offshore location as destination nor as alternate unless the weather forecasts for the two offshore locations indicate that, during a period commencing 1 hour before and ending 1 hour after the expected time of arrival at the destination and alternate, the weather conditions will be at or above the planning minima shown in the following table:

<b>Planning minima</b>		
	Day	Night
Cloud base	600 ft	800 ft
Visibility	4 km	5 km

(3) Conditions of fog

Where fog is forecast, or has been observed within the last 2 hours within 60 NM of the destination or alternate, an offshore destination alternate helideck should not be used.

(d) Actions at point of no return

Before passing the point of no return, this should not be more than 30 minutes from the destination, the following actions should have been completed;

- (1) confirmation that navigation to the offshore destination and offshore destination alternate can be assured;
- (2) radio contact with the offshore destination and offshore destination alternate (or master station) has been established;
- (3) the landing forecast at the offshore destination and offshore destination alternate have been obtained and confirmed to be at or above the required minima;
- (4) the requirements for OEI landing (see (b)) have been checked in the light of the latest reported weather conditions to ensure that they can be met; and
- (5) to the extent possible, having regard to information on current and forecast use of the offshore alternate helideck and on conditions prevailing, the availability of the helideck on the offshore location intended as destination alternate should be guaranteed by the duty holder (the rig

operator in the case of fixed installations and the owner in the case of mobiles) until the landing at the destination, or the offshore destination alternate, has been achieved or until offshore shuttling has been completed.

(e) Offshore shuttling

Provided that the actions in (d) have been completed, offshore shuttling, using an offshore alternate aerodrome, may be carried out.

**GM1 SPA.HOFO.115 Selection of aerodromes and operating sites<sup>30</sup>**

OFFSHORE DESTINATION ALTERNATE AERODROME

When operating offshore any spare payload capacity should be used to carry additional fuel if it would facilitate the use of an onshore alternate aerodrome.

**GM1 SPA.HOFO.120 Flight data monitoring (FDM) programme**

Further guidance can be found in AMC1, GM1 and GM2 ORO.AOC.130.

**AMC1 SPA.HOFO.125 Flight following system**

The flight following system should provide sufficient and timely information to track the aircraft in flight so that any deviation or anomaly from the planned flight path may be detected as early as possible.

**GM1 SPA.HOFO.125 Flight following system**

A flight following system may consist of one of the following items:

- (a) satellite tracking;
- (b) ATC tracking and information; or
- (c) ADS-B tracking and display.

**AMC1 SPA.HOFO.130 Airborne radar approach (ARA) to offshore locations<sup>31</sup>**

GENERAL

- (a) 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 1 NM, the pilot-in-command/commander should:
  - (1) approach to a nearby target structure and thereafter proceed visually to the destination structure; or

<sup>30</sup> Transferred from AMC1 CAT.OP.MPA.181, first section.

<sup>31</sup> Transferred from AMC1 CAT.OP.MPA.120.

- (2) make the approach from another direction leading to a circling manoeuvre.
- (b) The cloud ceiling should be sufficiently clear above the helideck to permit a safe landing.
- (c) Minimum descend 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.
  - (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.
- (d) Minimum descend altitude (MDA) may only be used if the radio altimeter is unserviceable. The MDA should be a minimum of MDH + 200 ft and should be based on a calibrated barometer at the destination or on the lowest forecast QNH for the region.
- (e) The decision range should not be less than  $\frac{3}{4}$  NM.
- (f) The MDA/H for a single-pilot ARA should be 100 ft higher than that calculated using (c) and (d) above. The decision range should not be less than 1 NM.

**GM1 SPA.HOFO.130 Airborne radar approach (ARA) to offshore locations**

GENERAL

- (a) General
  - (1) The helicopter ARA procedure may have as many as five separate segments. These are the arrival, initial, intermediate, final, and missed approach segments. In addition, the specifications of the circling manoeuvre to a landing under visual conditions should be considered. The individual approach segments can begin and end at designated fixes. However, the segments of an ARA may often begin at specified points where no fixes are available.
  - (2) The fixes, or points, are named to coincide with the associated segment. For example, the intermediate segment begins at the intermediate fix (IF) and ends at the final approach fix (FAF). Where no fix is available or appropriate, the segments begin and end at specified points; for example, intermediate point (IP) and final approach point (FAP). The order in which this GM discusses the segments is the order in which the pilot would fly them in a complete procedure: that is, from the arrival through initial and intermediate to a final approach and, if necessary, the missed approach.
  - (3) Only those segments that are required by local conditions applying 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 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) Examples of ARA procedures, vertical profile and missed approach procedures are presented in figures 1 to 5.

(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 exceeding 500 ft above mean sea level (AMSL), the uncontrolled offshore obstacle environment applying to the arrival, initial and intermediate approach segments can reasonably be assumed to be capable of reaching to at least 500 ft AMSL. But, 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 radar results in an uncontrolled surface environment that extends to an elevation of 50 ft AMSL.
- (2) Under normal circumstances the relationship between the approach procedure and the obstacle environment is governed according to 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 en-route obstacle clearance criteria should be applied to the arrival segment.

(d) Initial approach segment

The initial approach segment is only required if a course reversal, race track or arc procedure is necessary to join the intermediate approach track. The segment commences at the IAF and on completion of the manoeuvre 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 and prepare the helicopter 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) The final approach segment commences at the FAP and ends at the missed approach point (MAPt). The final approach area, which should be identified on 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. However, within the final approach area the MDA/H will provide separation from the surface environment. Descent from 1 000 ft AMSL to 200 ft AMSL at a constant 6.5 % gradient will involve a horizontal distance of 2 NM. In order to follow the guideline that the procedure should not generate an unacceptably high workload for the flight crew, the required actions of levelling at MDH, changing heading at the offset initiation point (OIP), and turning away at MAPt should not be planned to occur at the same time from the destination.
- (3) During the final approach compensation for drift should be applied and the heading which, if maintained would take the helicopter directly to the destination, should be identified. It follows that, at an OIP located at a range of 1.5 NM, a heading change of 10° is likely to result in a track offset of 15° at 1 NM, and the extended centre line of the new track can be expected to have a mean position lying some 300–400 m to one side of the destination structure. The safety margin built in to the 0.75 NM decision range (DR) is dependent upon the rate of closure with the destination. Although the airspeed should be in the range of 60–90 kt during the final approach, the ground speed, after due allowance for wind velocity, should be no greater than 70 kts.

(g) Missed approach segment

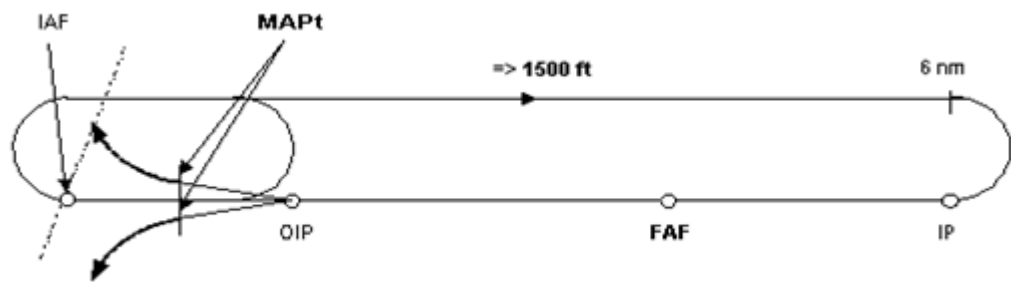
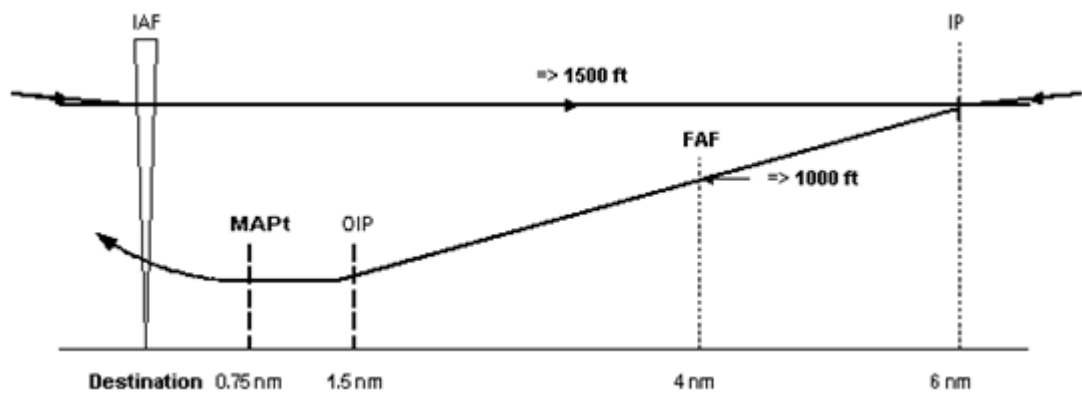
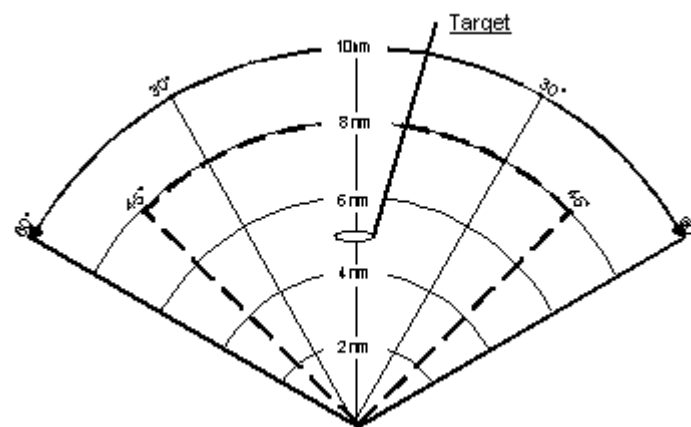
- (1) The missed approach segment commences at the MAPt and ends when the helicopter reaches minimum en-route altitude. The missed approach manoeuvre is a 'turning

missed approach' which should be of not less than 30° and should not, normally, be greater than 45°. A turn away of more than 45° does not reduce the collision risk factor any further nor does it permit a closer DR. However, turns of more than 45° may increase the risk of pilot disorientation and by inhibiting the rate of climb (especially in the case of an OEI missed approach procedure) may keep the helicopter at an extremely low level for longer than is desirable.

- (2) 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 executing 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 which prevails outside the area.
- (3) A missed approach area, taking the form of a 45° sector orientated left or right of the final approach track, originating from a point 5 NM short of the destination, and terminating on an arc 3 NM beyond the destination, will normally satisfy the specifications of a 30° turning missed approach.
- (h) Required visual reference  
The visual reference required is that the destination should be in view in order that a safe landing may be carried out.
- (i) Radar equipment  
During the ARA procedure, colour mapping radar equipment with a 120° sector scan and 2.5 NM range scale selected may result in dynamic errors of the following order:
  - (1) bearing/tracking error  $\pm 4.5^\circ$  with 95 % accuracy;
  - (2) mean ranging error – 250 m; or
  - (3) random ranging error  $\pm 250$  m with 95 % accuracy.





**Figure 3: Holding pattern & race track procedure****Figure 4: Vertical profile****Figure 5: Missed approach area left & right**

**AMC1 SPA.HOFO.155 Additional requirements in a hostile environment****OPENING ESCAPE HATCHES**

When an approved modification for the helicopter type exists, pop-out windows should be installed at the next planned major modification of the helicopter.

**AMC1 SPA.HOFO.160 Vibration health monitoring system****GENERAL**

Any VHM system should meet all of the following criteria:

**(a) VHM system capability**

The VHM system should measure vibration characteristics of rotating critical components during flight utilising suitable vibration sensors, techniques, and recording equipment. The frequency and flight phases of data measurement should be established together with the type certificate holder (TCH) during initial entry into service. In order to appropriately manage the generated data and focus upon significant issues, an alerting system should be established; this is normally automatic. Accordingly, alert generation processes should be developed to reliably advise maintenance personnel of the need to intervene and help determine what type of intervention is required.

**(b) Approval of VHM installation**

The VHM system, which typically comprises vibration sensors and associated wiring, data acquisition and processing hardware, the means of downloading data from the rotorcraft, the ground-based system and all associated instructions for operation of the system, should be certified to CS-29 or equivalent established by the Agency. For applications that may also provide maintenance credit (see AC 29 MG15), the level of system integrity required may be higher.

**(c) Operational procedures**

The operator should establish procedures to address all necessary VHM subjects.

**(d) Training**

The operator should determine which staff will require VHM training, determine appropriate syllabi, and incorporate them into the operator's initial and recurrent training programmes.

**GM1 SPA.HOFO.160 Vibration health monitoring system****GENERAL**

Operators should utilise available international guidance material provided for the specification and design of VHM systems. Examples of such guidance material are:

CS 29.1465 'Vibration Health Monitoring' and associated AMC;

AC 29 MG15 'Airworthiness Approval of Rotorcraft Health Usage Monitoring Systems (HUMS)'; and

UK CAP 753 'Helicopter Vibration Health Monitoring'.

### **AMC1 SPA.HOFO.165 Crew requirements**

#### **FLIGHT CREW TRAINING AND CHECKING**

(a) Flight crew training and checking programmes should:

- (1) improve knowledge of the offshore operations environment with particular consideration of visual illusions during approach introduced by lighting, motion and weather factors;
- (2) improve crew cooperation specifically for offshore operations;
- (3) provide flight crew members with the necessary skills to appropriately manage the risks associated with normal, abnormal and emergency procedures during flights by day and night;
- (4) if night operations are conducted, give particular consideration to approach, go-around, landing, and take-off phases;
- (5) include instruction on the optimum use of the helicopter's automatic flight control system (AFCS);
- (6) emphasise on monitoring the pilot's skills; and
- (7) include standard operating procedures.

(b) Emergency and safety equipment training and checking should focus on the equipment fitted/carried. Water entry and sea survival training, including operation of all associated safety equipment, should be an element of the recurrent training as described in AMC1 ORO.FC.230(a)(2)(iii)(F).()

(c) The measures referred to above shall be assessed during:

- (1) operator proficiency checks;
- (2) line checks; and
- (3) emergency and safety equipment checks.

(d) Training and checking should make full use of flight simulation training devices, preferably full flight simulators, for normal, abnormal, and emergency procedures related to helideck operations.

(e) Recency may be re-established on training flights in the helicopter or in a full flight simulator.

## (d) Amendment of AMC/GM to Annex VI, Part-NCO

AMC1 NCC.OP.152 Destination alternate aerodromes — helicopter, is deleted.

AMC1 NCC.IDE.H.231 Additional requirements for helicopters conducting offshore operations in a hostile sea area, is deleted.

## (e) Amendment of AMC/GM to Annex VIII, Part-SPO

AMC1 SPO.OP.156 Destination alternate aerodromes — helicopter, is deleted.

AMC1 SPO.IDE.H.201 Additional requirements for helicopters conducting offshore operations in a hostile sea area, is deleted.

AMC4 SPO.OP.110 Aerodrome operating minima — aeroplanes and helicopters, Table 1.H.

Additional text, 'Valid only for operators holding a SPA.HOFO approval', added behind 'Offshore helideck \*'.

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 centreline marking	400
Runway edge/FATO light, centreline marking and relevant RVR information	400
<b>Offshore helideck * Valid only for operators holding a SPA.HOFO approval.</b>	
Two-pilot operations	400
Single-pilot operations	500

## C. Regulatory Impact Assessment

### Process and consultation

The rulemaking group identified the risks involved in helicopter offshore operations and established related mitigating measures.

Each risk and associated mitigation measure was assessed taking into account the following four requirements mentioned in the Terms of Reference (ToR):

- To assess which CAT IRs need to be amended and complemented taking into account the situation in Member States as well as results of recent studies and known authority or industry risk assessments.
- To assess if all offshore-related provisions should be included in a new subpart of Part-SPA, thus becoming a specific approval.
- To assess the risk and mitigating measures for non-commercial and specialised operations and, as appropriate, propose suitable requirements.
- To assess if new technology, either available or in use by some Member States, should be mandatory.

The rulemaking group took into account two studies related to helicopter offshore operations<sup>32</sup>, relevant accident/incident data, additional national requirements and implementation issues identified leading to an uneven level playing field. The group used various data sources to obtain information on affected operators and fleet.

The RIA evolved from this process.

### Issue analysis and risk assessment

#### 1.1 What are the issue and the current regulatory framework?

##### 1.1.1 Background information

##### 1.1.1.1 The number of helicopters and Member States involved in offshore operations

The chart below indicates that 242 helicopters are being used by 14 Member States for overwater including offshore operations. The area defined as 'Oil & gas/Offshore transfer' involves 214 helicopters from 10 Member States with Norway and the United Kingdom being the main players with 155 helicopters, followed by France and the Netherlands with 34 helicopters.

<sup>32</sup> HSS-3 Helicopter Safety Study 3. Report by SINTEF Technology and Society, Trondheim, Norway on behalf of BP, ConocoPhillips, Eni, GDF SUEZ, Marathon, Nexen, the Norwegian Civil Aviation Authority, Shell, Statoil and Total. Authors: Ivonne A. Herrera, Solfrid Haabrekke, Tony Kraagenes, Per R. Hokstad, Ulla Forseth.

IADC/SPE 98672 Helicopter Safety in the Oil and Gas Business. A paper prepared and presented at the IADC/SPE Drilling Conference held in Miami, Florida, USA 21-23 February 2006. Authors: E. Clark and C. Edwards, formerly with Shell Aircraft Intl., P. Perry, Consultant/Shell Aircraft Intl., and G. Campbell and M. Stevens, Shell Aircraft Intl.

**Table 1 — Number of helicopters per MS and per type of overwater operation**

Country	Fish spotting & environme	Air taxi / Charter	Corporate / Private	EMS	General purpose	Oil & gas / Offshore transfer	Total
Belgium				1		8	9
Denmark		1				8	9
Finland		1					1
France		2	1			19	22
Germany		3				3	6
Ireland						2	2
Italy			2	1		1	4
Netherlands						15	15
Norway		1				58	59
Portugal						3	3
Spain	4			2			6
Sweden		1		2			3
Switzerland		1	1				2
United Kingdom			2	1	1	97	101
<b>Total</b>	<b>4</b>	<b>10</b>	<b>6</b>	<b>7</b>	<b>1</b>	<b>214</b>	<b>242</b>

Source: HeliCAS Current Helicopter Data File. Update period: December 2011

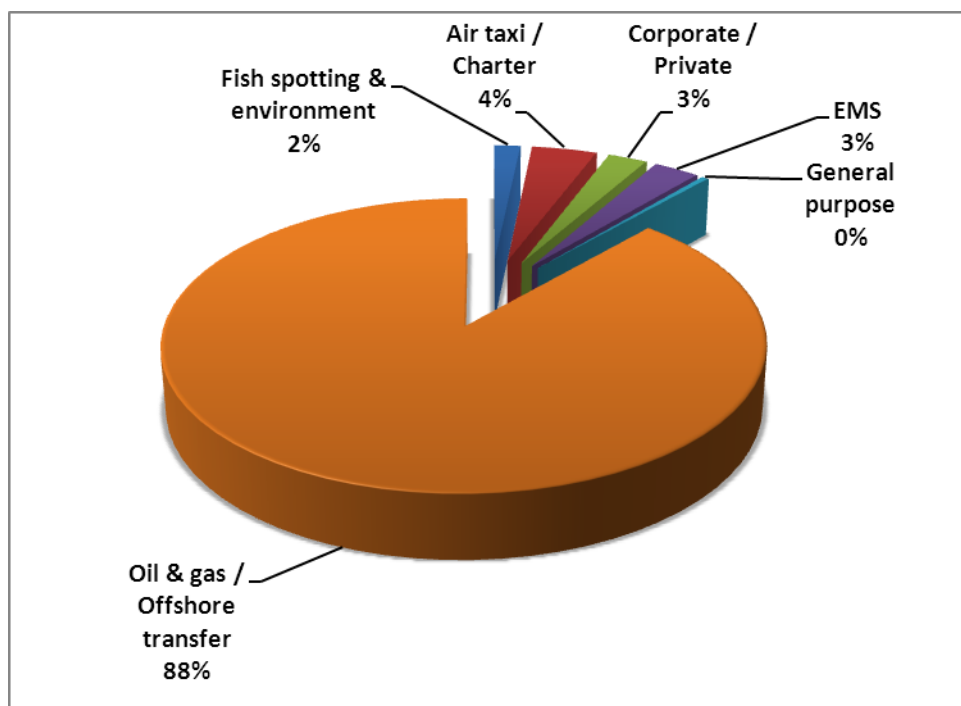
Charts 2 below depict a per cent indication of market allocation.

This indicates that 12 % is contributed by:

- fish spotting & environment (2 %)
- air taxi/charter (4 %)
- corporate/private (3 %)
- EMS (3 %)

Oil & gas/Offshore transfer (offshore operations) contribute to 88 % of the market. It is further assumed that the majority of these flights are performed as CAT.

**Table 2 — Relative shares of offshore operations versus other overwater operations**



### 1.1.2 Regulatory framework

Commission Regulation (EU) No 965/2012 for Air Operations and associated Opinions No 01/2012 'Air Operations-OPS (Part-NCC and Part-NCO)' and No 02/2012 'Air Operations-OPS (Part-SPO)' that govern helicopter operations are used as reference regulations within this document. They distinguish between commercial air transport (CAT), non-commercial operations with complex or non-complex motor-powered aircraft (NCC/NCO) and specialised operations (SPO).

'Commercial air transport operation' is defined in the Air OPS Cover Regulation as follows:

'Commercial air transport (CAT) operation means an aircraft operation to transport passengers, cargo or mail for remuneration or other valuable consideration.'

A proposal for a definition of specialised operations was made with Opinion No 02/2012 as follows:

'Specialised operation' means any commercial operation other than commercial air transport and any non-commercial operation where:

- (a) the aircraft is flown close to the surface to fulfil the mission;
- (b) aerobatic manoeuvres are performed;
- (c) special equipment is necessary to fulfil the mission;
- (d) task specialists are required;



- (e) substances are released from the aircraft during the flight;
- (f) external loads or goods are lifted or towed;
- (g) persons enter or leave the aircraft during flight; or
- (h) the purpose of the mission is to display an aircraft, to advertise or to participate in a competition.

In relation to specialised offshore operations, points (b) and (h) are not valid.

The Basic Regulation defines a complex motor-powered helicopter in paragraph (j)(ii) of Article 3 as a helicopter certificated for:

- a take-off mass exceeding 3 175 kg, or
- a maximum passenger seating configuration of more than nine, or
- operation with a minimum crew of at least two pilots.

An other-than-complex helicopter is therefore deduced from the Basic Regulation text as being certificated for:

- a maximum take-off mass of 3 175 kg or less, or
- a maximum passenger seating configuration of nine or less, or
- operation with a minimum crew of one pilot.

### **1.1.3 Issues with the existing rules**

#### **1.1.3.1 Uneven implementation of regulations**

First of all, the definition of 'offshore operations' leaves room for interpretation as to whom it applies and consequently in terms of risk mitigation measures adopted by Member States:

- Annex I Definitions defines 'offshore operations' as 'operations which routinely have a substantial proportion of the flight conducted over sea areas to or from offshore locations'. Some MS may consider offshore operations in a wider sense to include any activity over open sea areas, for example also aerial work while others restrict it to CAT operations.

For the purpose of this NPA and RIA, offshore operations should therefore be understood as helicopter operations that have a substantial proportion of any flight conducted over open sea areas to or from an offshore location for the purpose of:

- support to offshore oil, gas and mineral exploration, production, storage and transport;
- support to offshore wind turbine and other renewable energy sources;
- support to marine lights; and
- sea-pilot transfer.

The different national interpretations may also be due to the lack of common understanding on the link between 'hostile environment' and 'offshore operation', in particular as regards the designation of open sea areas north of 45N and south of 45S.

- Water overflow during offshore operations is divided into hostile and non-hostile areas.

- For the purpose of this NPA and RIA, 'hostile environment' shall be understood as:
  - (a) an environment in which:
    - (1) a safe forced landing cannot be accomplished because the surface is inadequate;
    - (2) the helicopter occupants cannot be adequately protected from the elements;
    - (3) search and rescue response/capability is not provided consistent with anticipated exposure; or
    - (4) there is an unacceptable risk of endangering persons or property on the ground.
  - (b) in any case, the following areas:
    - (1) for overwater operations, the open sea areas north of 45N and south of 45S; and
    - (2) those parts of a congested area without adequate safe forced landing areas.
- Hostile environment in relation to helicopter offshore operations is particularly covered by items (a)(1) to (3) and (b)(1).

Secondly, the present rules do not reflect the current national regulations adapted to the North Sea environment, mainly from the United Kingdom and Norway where the majority of helicopter offshore operations take place. There is the risk that current EU rules may authorise an operator to perform helicopter offshore operation in the North Sea without the relevant risk mitigation measures. This may increase in safety risks and also leads to an uneven level playing field.

For example, it is theoretically possible that a Member State allows an operator to conduct offshore operations based on the existing EU regulations. This operator may then operate elsewhere in the EU and more specifically in a Member State where there are specific national safety rules to mitigate specific local conditions like in the North Sea. The operator would access this market with a lower investment and would increase the safety risk of the offshore employees in addition to the helicopter crew. In addition, that operator might endanger other operations in the area as it is not familiar with the particular operating environment and conditions.

Finally, the regulations regarding Performance Class 2 (PC2) helideck landing and take-off do not appear sufficiently precise to establish a common safety level and level playing field as it leaves room for interpretation. Provisions for procedures and planning criteria should be introduced to minimise the risk of collision with the deck edge and obstacles.

### **1.1.3.2 Rules for CAT helicopter offshore operations**

CAT helicopter offshore operations within the Member States were not governed by a common regulatory framework under JAR-OPS 3. Norway and the United Kingdom, from which the majority of helicopter offshore operations are conducted, introduced additional national rules and conditions for CAT helicopter offshore operations. Those are based on best regulatory practices and industry standards achieved from lessons learned from incidents and accidents over a considerable amount of years of operation.

In addition, Denmark, Ireland, Norway and the United Kingdom issue special approvals for offshore operations to ensure the achievement of safety standards. Denmark has an additional specific approval for operations in relation to Performance Class 2 Enhanced. However, while these national rules follow the same approach to ensure safety, they are not exactly the same and this would pose difficulties concerning the mutual recognition of these special approvals.

The fact that these rules are nationally driven can be explained by the fact that 70 % of the helicopter fleet for offshore operations is registered in four Member States: Denmark, Ireland, Norway and the United Kingdom.

Commission Regulation (EU) No 965/2012 for CAT neither reflects any of the additional national rules or conditions, nor does it incorporate a specific approval for offshore operations. As a result Denmark, Ireland, Norway, and the United Kingdom do not consider the EU rules for CAT to reflect the necessary and required levels of safety previously maintained, and expressed the need for a specific approval for offshore operations.

Paragraph 4 of Article 6 (Derogations) of Commission Regulation (EU) No 965/2012 allows Member States to continue national practices under certain conditions. However, it is the endeavour of this rulemaking task to harmonise the requirements. Consequently, the derogation enshrined in the OPS cover regulation will no longer be valid subsequent to this rulemaking task and the related adoption of rules.

#### **1.1.3.3 Rules for NCC and NCO helicopter offshore flights**

Non-commercial flights to offshore destinations within the Member States were previously regulated (or not) or prohibited by national regulations. The Opinion<sup>33</sup> for EU regulations for NCC incorporates some operational procedures and equipment requirements. These requirements are proportionate meaning that the rules would allow flights to any offshore location at a lower safety level than CAT. The data assessed by the Agency indicates that approximately 3 % of the offshore operations are conducted as non-commercial operations. As explained above, NCO operations are not further considered for this proposal.

#### **1.1.3.4 Rules for SPO helicopter offshore flights**

Aerial work flights to offshore destinations were previously regulated (or not) by national rules. The Opinion<sup>34</sup> for EU regulations for SPO regarding helicopter operations incorporates some operational procedures and equipment requirements. These requirements are proportionate meaning that the rules would allow flights to any offshore location at a lower safety level than CAT. Currently, SPO offshore operations are limited (2–5 % of the total offshore flights as a rough estimate). Based on the safety risk assessment matrix, new provisions are proposed.

#### **1.1.3.5 Summary of the regulatory issues**

The safety risks may increase due to uneven implementation of Commission Regulation (EU) No 965/2012 and associated Opinions leading to an uneven playing field in relation to helicopter operations to offshore destinations. The following items need to be considered to ensure a safe level playing field with proportionate common European requirements:

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<sup>33</sup> Opinion No 01/2012 'Air Operations — OPS (Part-NCC and Part-NCO)'.

<sup>34</sup> Opinion No 02/2012 'Air Operations — OPS (Part-SPO)'.

- common definitions for offshore operations, offshore location, and hostile environment;
- helideck landing and take-off PC-2 procedures; and
- harmonised requirements and means of oversight (specific approval).

## **1.2 Who is affected?**

As shown further below, NAAs, operators, and pilots are affected by the regulatory framework.

Manufacturers of helicopters and equipment may see a similar effect of the regulation as the industry may require new or upgraded equipment. This effect is, however, not further considered.

### **1.2.1 Number of offshore helicopters in Member States**

Information received from Member States regarding offshore helicopters indicates that 11 Member States use 230 helicopters of 10 different types for offshore operations, representing 3 manufacturers.

Norway and the United Kingdom operate nearly 70 % of the total fleet and 95 % of the more-than-18-seat helicopters (S-92, EC 225, and AS 332).

**Table 3 — Helicopters used in overwater flights including offshore operations (year 2011)**

Type	AS332	AS365	AW139	EC135	EC145	EC155	EC225	S-61	S-76	S-92	Total
Austria (a)											0
Belgium (a)		9				2					11
Czech Rep. (a)											0
Denmark (b)			2			4				3	9
Estonia (a)											0
Finland (a)											0
France (a)	2	12							7		21
Germany (a)											0
Hungary (a)											0
Iceland (a)											0
Ireland (a)				1							1
Italy (b)			4								4
Lativa (a)											0
Lithuania (a)											0
Netherlands (a)			5			3			6		14
Norway (a)	16		1		1		11			28	57
Poland (a)											0
Portugal (b)		2	1								3
Slovakia (a)		4	1	1							6
Spain (b)		4	1	1							6
Sweden (a)											0
Switzerland (b)			1						1		2
UK (a)	22	10	10	1		4	16	7	13	13	96
<b>Total</b>	<b>40</b>	<b>41</b>	<b>26</b>	<b>4</b>	<b>1</b>	<b>13</b>	<b>27</b>	<b>7</b>	<b>27</b>	<b>44</b>	<b>230</b>

**Sources:**

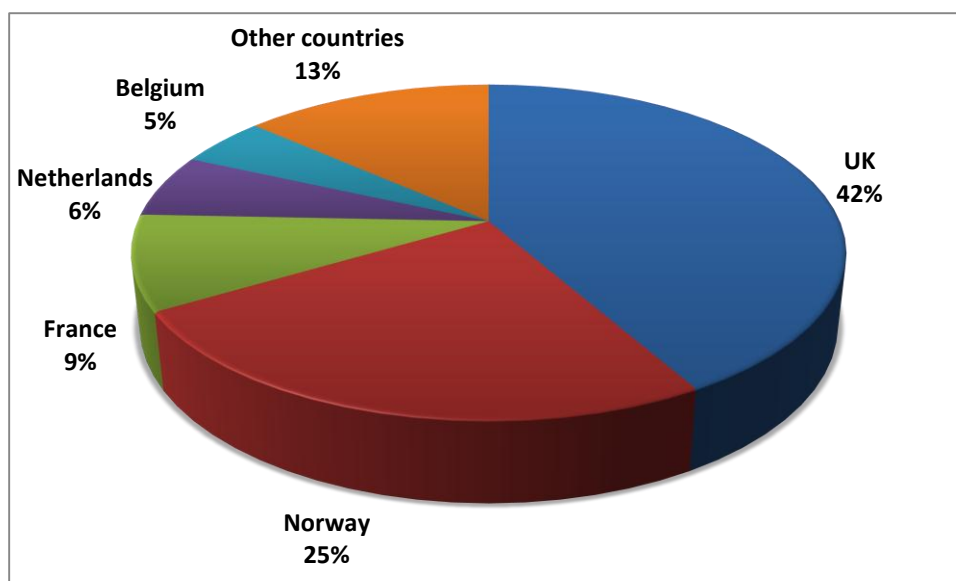
a: NAA feedback

b: HeliCAS Current Helicopter Data File. Update period: December 2011

**Note:**

No data for Bulgaria, Cyprus, Greece, Liechtenstein, Luxembourg, Malta, Romania and Slovenia

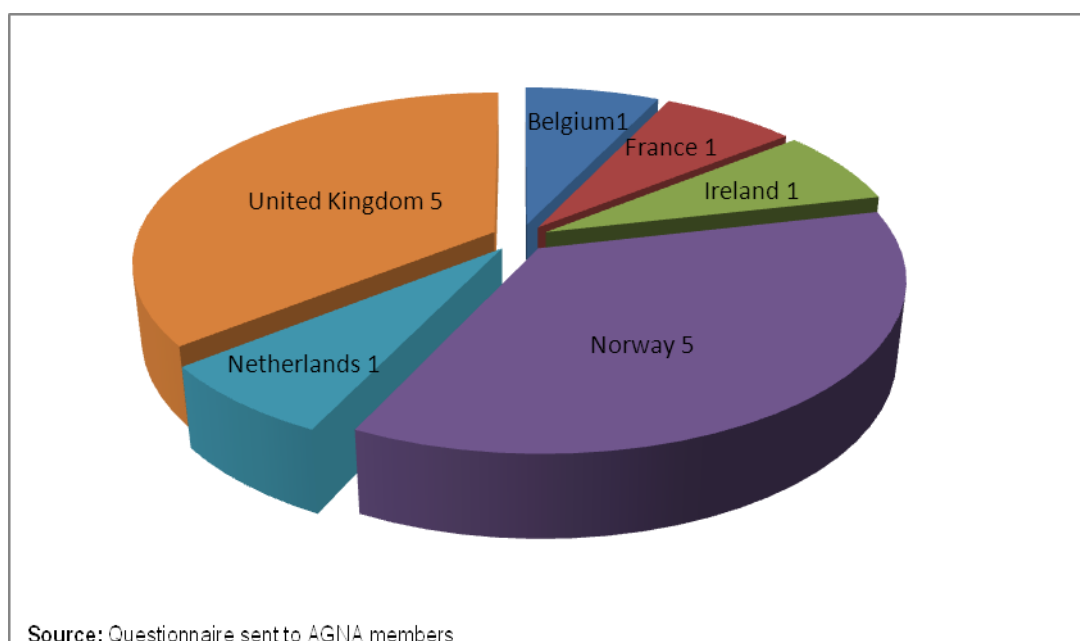
This table is very similar to table 1 in section 2.1.1. The difference is explained by the missing information from some Member States. Overall the total fleet difference between these 2 tables is 12 helicopters, i.e. 5 % of the fleet. This difference has no significant influence on the analysis.

**Table 4 — Share of offshore helicopters per Member State****1.2.2 Number of CAT offshore helicopter operators**

Information received from Member States regarding the number of CAT helicopter operators indicates that 6 Member States have a total of 14 CAT operators.

Norway and the United Kingdom account for 10 of the 14 CAT operators.

The results are presented in the chart below.

**Table 5 — Number of CAT offshore helicopter operators per Member State**

### 1.2.3 Number of offshore helicopter flight hours

The number of flight hours is based on offshore operations from/to oil & gas offshore locations. Due to the fact that 95 % of the helicopter fleet is used for such operations (table 7), it can be estimated that the flight hours for these operations represent about 95 % of the total flight hours.

**Table 6 — Offshore traffic volume in NO and UK (million person flight hours to/from offshore locations)**

Time period	NO	UK	NO + UK
1990–1998	5.2	10.5	15.7
1999–2009	7.8	6.1	13.9

Source: HSS-3 extract from chart 5.2.

These operations can be mainly attributed to the 'CAT' category of the EU Air OPS rules.

### 1.2.4 NAAs

Member States are responsible to maintain oversight of the activity taking place in their territory. They may designate different national competent authorities. In addition, the Member State is responsible for certifying operators. Both, oversight and certification process require resources.

### 1.2.5 Summary

Any proposal:

- must take into account the identified risks inherent in helicopter operations;
- should ensure that NAA experience with safety rules for helicopter offshore operations as well as industry best practices is duly considered when establishing appropriate harmonised rules at EU level; and
- must consider minimising additional burden on NAAs and operators.

## 1.3 What are the safety risks?

### 1.3.1 Risk and mitigation measures — Shortlist

Due to their design, helicopters are potentially vulnerable to catastrophic mechanical failures because of the high number of single-load-path critical parts within the rotor and rotor drive systems and the reduced redundancy within their design.

In addition, helicopter offshore operations are in general exposed to high risks when operating in hostile environment. According to the definition of hostile environment, in such environment 'a safe forced landing cannot be accomplished because the surface is inadequate, the helicopter occupants cannot be adequately protected from the elements, or search and rescue response/capability is not provided consistent with anticipated exposure'. For operations in non-hostile environment the mentioned definition is not valid; however, experience shows that elements of risk are present.

A risk and mitigation measures matrix has been developed to identify the risk factors associated with helicopter operations to offshore locations which would be subject to mitigation in the proposed rules. The matrix is presented in Annex A. The risks and possible mitigating measures are valid for all types of offshore operations.

Below is an extract of the risk mitigation matrix. It contains only those items where rulemaking is identified as an appropriate means. Additional columns are added indicating if the mitigating measure is supported data stemming from:

- a recommendation from an accident investigation organisation or board (AIB);
- one of the two safety studies (Studies); or
- the EASA database for accidents and serious incidents (EASA database).



**Table 7 — Risk and mitigation measures — Shortlist**

<b>Safety risk</b>	<b>Mitigation</b>	<b>AIB</b>	<b>Studies</b>	<b>EASA database Acc Accident SI Serious Incident</b>	<b>Notes</b>
Insufficient authority oversight.	<ul style="list-style-type: none"> <li>— Ensure that appropriate authority requirements for oversight are in place.</li> <li>— Such rules could include additional approval requirements to enhance oversight due to the high risk of offshore operations.</li> </ul>			PH-NZG, SI G-JSAR, Acc LN-ONI, SI	Part-ARO includes general requirements on oversight and certification of AOC holders.  Specific approval (SPA) not in place.
Failure of components or systems due to fatigue risk.	Require installation and use of VHM to detect fatigue of components early.	Yes	Yes	G-REDL, Acc Fatal	ICAO recommendation. Already national requirements in NO and the UK for CAT, and used by major operators.
Lack of contact with helicopters as they are outside radar, thus risking longer rescue time.	Require implementation of a flight following system.	Yes		G-BJVX, Acc Fatal	National requirement in NO.
Insufficient human operational performance.	Mandate use of flight data (FDM)/human performance monitoring.  Develop training programme.	Yes	Yes	PH-NZG, SI LN-ODB, SI LN-ONH, SI G-JSAR, Acc G-BKXD, Acc LN-ONZ/LN-OLB, SI LN-ONI/LN-OHK, SI	
Improper use of automatic flight control systems (AFCS) by crew.	Specify proper AFCS procedures in training programme.	Yes		G-JSAR, Acc G-REDU, Acc	
Insufficient/lack of procedures for offshore approaches.	Develop rule for stabilised approaches and approach monitoring.		Yes		Major operators have procedures.

Safety risk	Mitigation	AIB	Studies	EASA database Acc: Accident SI: Serious Incident	Notes
<p>Insufficient offshore related training.</p> <p>NOTE: This item includes all items in the risk matrix that are related to training.</p>	<p>Establish training requirement including use of simulators focusing on:</p> <ul style="list-style-type: none"> <li>— night operations including shuttle,</li> <li>— offshore approaches and departure (day and night),</li> <li>— severe situations and emergency procedures,</li> <li>— technical faults,</li> <li>— ditching procedures (in simulator),</li> <li>— realistic evacuation training,</li> <li>— helicopter underwater escape training,</li> <li>— CRM,</li> <li>— recurrent training.</li> </ul>		Yes	<p>G-JSAR, Acc</p> <p>LN-ODB, SI</p> <p>LN-ONH, SI</p> <p>G-JSAR, Acc</p>	
Fear of inflight collision.	<p>Establish regulation to ensure quality accuracy of NAV database.</p> <p>Establish regulation to ensure horizontal and vertical traffic separation.</p>				
Fear of controlled flight into the sea.	Develop procedure to update radio altimeter to provide more sophisticated warnings.				AMC to CAT.IDE.H.145

Safety risk	Mitigation	AIB	Studies	EASA database Acc SI Accident Serious Incident	Notes
Imprecise passenger safety briefing.	<p>Establish procedure for passenger briefing including the following aspects (but not limited to) to be provided via video brief prior to boarding the aircraft for both onshore and offshore legs:</p> <ul style="list-style-type: none"> <li>— demonstration on the use of the life jackets used in that helicopter;</li> <li>— briefing on the proper use of survival suits, including the need to have suits fully zipped with hoods and gloves ON during take-off and landing or otherwise advised by the pilot-in-command /commander;</li> <li>— demonstration of life raft deployment and boarding;</li> <li>— demonstration of deployment of all survival equipment;</li> <li>— boarding and disembarkation instructions.</li> </ul>				The safety briefing is of vital importance for the passengers, and repetition of essential information regarding safety equipment and behaviour has proved to be necessary.
Unable to communicate with passengers.	The helicopter shall be fitted with a PA system of sufficient clarity and volume so that passengers are capable of understanding instructions from the crew at all times during flight.				<p>Required for CAT with more than 9 passengers.</p> <p>This is of vital importance especially during abnormal or emergency situations.</p> <p>Should be required for NCC.</p> <p>If pilot's voice cannot be clearly heard in a 9 or less passenger helicopter, PA system should be mandated.</p>

### 1.3.2 Risks identified in the published studies

The most important and common contributing factors to risk reduction defined by the already mentioned studies<sup>35</sup> are:

- introduction of newest helicopter design and technology;
- improved operational training;
- use of VHM;
- introduction of SMS; and
- use of FDM.

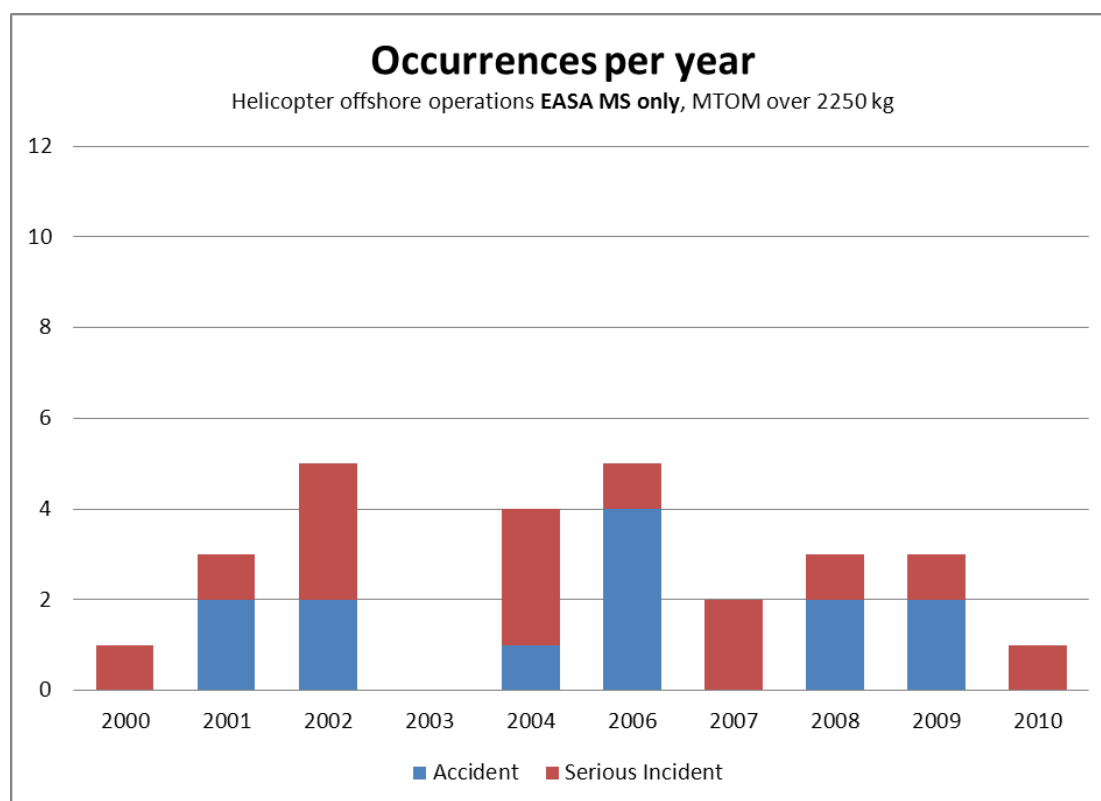
Extracts of the studies are presented in Annex B.

#### 1.3.2.1 Accident/Incident Data

##### *Occurrences in the North Sea 2000–2010*

The EASA database includes 13 accidents and 14 serious incidents in offshore operations during the period 2000–2010, involving helicopters with a maximum take-off mass (MTOM) exceeding 2 250 kg. There are no reported accidents or serious incidents in 2003 and 2005.

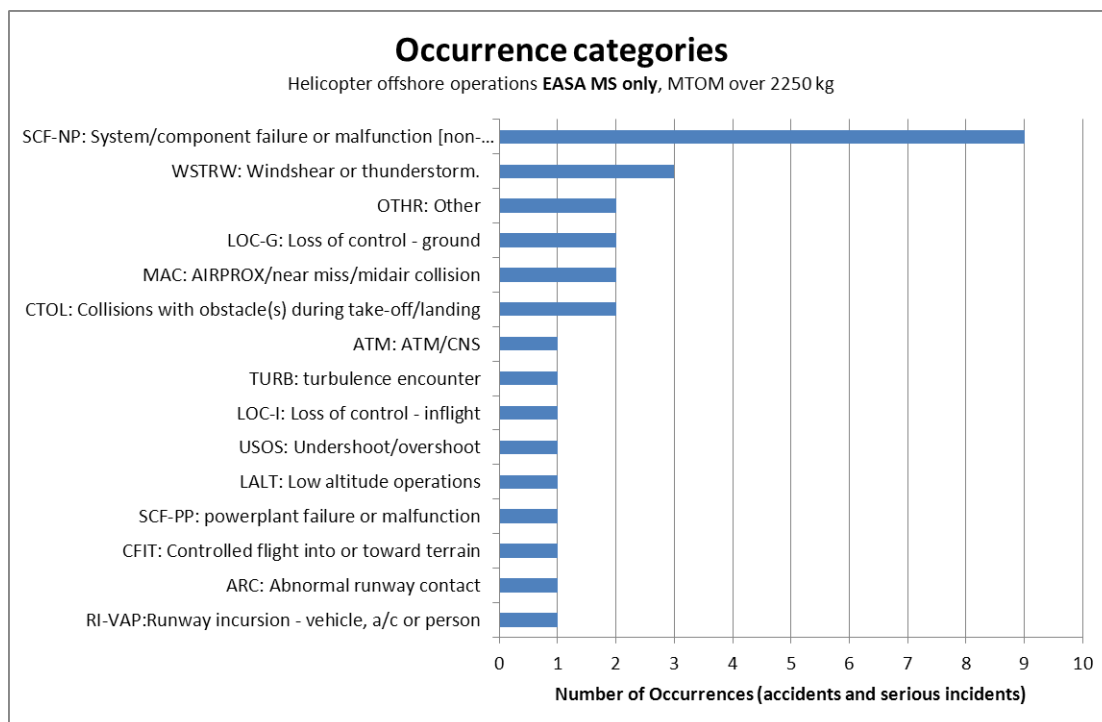
**Table 8 — Safety occurrences per year**



<sup>35</sup> Refer to FN 35.

**Table 9 — Safety occurrences related to table 8**

State of Occurrence	Occurrence Class	Date	Location	Phase of flight	Type of flight	Aircraft registration
UK	Serious incident	15/02/2000	North Sea	En route	Offshore	G-TIGT
NO	Serious incident	26/06/2001	North Sea	Approach	Offshore	LN-ODB
UK	Accident	12/07/2001	North Denes Aerodrome	Ground manoeuvring	Unknown	G-BMAL
UK	Accident	10/11/2001	North Atlantic Ocean	Standing	Offshore	G-BKZE
UK	Serious incident	28/02/2002	North Sea	En route	Offshore	G-TIGT
NL	Serious incident	18/03/2002	Near Den Helder	En route	Offshore	PH-NZU
UK	Accident	16/07/2002	North Sea	En route	Offshore	G-BJVX
NO	Serious incident	19/08/2002	North Sea	En route	Offshore	LN-ONZ LN-OLB
NO	Accident	05/11/2002	North Sea	En route	Offshore	LN-ONI
NO	Serious incident	08/01/2004	North Sea	Take-off	Offshore	LN-ONI
NO	Serious incident	09/07/2004	Near Stavanger	En route	Offshore	LN-ONI LN-OHK
UK	Accident	15/09/2004	Near Shetland	Manoeuvring	Sea-pilot transfer	G-BDOC
NL	Serious incident	30/11/2004	North Sea	En route	Offshore	PH-NZG
UK	Accident	03/03/2006	North Sea	En route	Offshore	G-CHCG
NO	Serious incident	10/06/2006	North Sea	Take-off	Offshore	LN-ONH
UK	Accident	13/10/2006	Aberdeen	Take-off	Offshore	G-PUMI
NL	Accident	21/11/2006	North Sea	En route	Offshore	G-JSAR
UK	Accident	27/12/2006	North Sea	Approach	Offshore	G-BLUN
NO	Serious incident	21/04/2007	Stavanger	Approach	Offshore	LN-ONZ
NL	Serious incident	11/09/2007	North Sea	En route	Offshore	OY-HIS
UK	Accident	22/02/2008	North Sea	En route	Offshore	G-REDM
UK	Accident	09/03/2008	North Sea	Landing	Offshore	G-BKXD
UK	Serious incident	23/12/2008	North Sea	En route	Offshore	G-CHCV
UK	Accident	18/02/2009	North Sea	Approach	Offshore	G-REDU
UK	Accident	01/04/2009	North Sea	En route	Offshore	LN-OMM
NO	Serious incident	28/04/2009	North Sea	En route	Offshore	OY-HKC
NL	Serious incident	31/08/2010	North Sea	Landing	Offshore	OY-HKC

**Table 10 — Occurrence categories**

Source: EASA database.

The figure above defines 10 occurrences due to engine and system/component failure (SCF-PP and SCF-NP) and 8 pilot induced occurrences (LOC-G, MAC, CTOL, LOC-I, USOS, LALT and CFIT).

**Table 11 — Accident statistics**

Parameter	1990–1998			1999–2009			1990–2009		
	NO	UK	North Sea	NO <sup>1</sup>	UK <sup>2</sup>	North Sea <sup>3</sup>	NO	UK	North Sea
Million person flight hours	5.2	10.5	15.7	7.8	6.1	13.9	13.1	16.6	29.7
Number of accidents	4	11	15	1	11	12	5	22	27
Number of fatal accidents	1	2	3	0	3	3	1	5	6
Percentage of fatal accidents	0.25	0.18	0.20	0	0.27	0.25	0.20	0.23	0.22
Number of fatalities	12	17	29	0	34	34	12	51	63
Accidents per million person flight hours (accident rate)	0.76	1.05	0.95	0.13	1.81	0.86	0.38	1.33	0.91
Number of fatalities per accident	3.0	1.5	1.9	0	3.1	2.8	2.4	2.3	2.3
Number of fatalities per million person flight hours	2.3	1.6	1.8	0	5.6	2.4	0.9	3.1	2.1
FAR	230	160	180	0	560	240	90	310	210

<sup>1</sup> Traffic volume for Norwegian sector in 2009 was stipulated the same as in 2008.

<sup>2</sup> Traffic volume for UK sector for 1999–2009 was stipulated the same as for the North Sea minus Norway.

<sup>3</sup> Traffic volume for the North Sea in 2008 and 2009 was stipulated the same as in 2007.

Source: Helicopter Safety Study 3, Table 5.4.

The table above from the Helicopter Safety Study 3 indicates that out of the 27 accidents involving helicopters in the North Sea during the period 1990 to 2009, 6 accidents were fatal.

The average number of fatalities per *fatal* accident is 10.3. The average accident rate in the North Sea for the period 1990–2009 was 0.91 accidents per million person flight hours. The rate varies between 0.38 for Norway and 1.33 for the United Kingdom.

The average number of fatalities per accident was 2.3.

### 1.3.2.2 What are the safety risks with the baseline scenario?

Option 0 'Do nothing' means that as long as there are no harmonised European regulations, Member States can continue to implement additional national requirements including a specific approval for helicopter offshore operations, or continue solely in accordance with the air operations requirements, adopted as Regulation (EU) 965/2012.

The regulatory framework will be different between the Member States. Risks identified in the risk matrix and by the safety studies might not be mitigated evenly throughout Member States. Safety recommendations from air investigation bureaus (AIB) may or may not be addressed.

Authority oversight will be performed at different levels contributing to the creation of differences in safety standards.

A possible scenario could be an operator with an AOC from a Member State solely following the EU CAT rules starting operations in a Member State where additional national safety requirements were introduced. This Member State would not have the possibility to require the operator to comply with its additional regulations. The operator would access this market with a lower investment and would increase the safety risk of the offshore employees/passengers as well as the helicopter crew.

A difference in safety standards would be created and a level playing field not be maintained.

### **2.3 Summary of issues**

The current regulatory framework does not provide for a level playing field. The safety risks may not be appropriately mitigated.

Member States and industry have already identified a certain number of safety risks which were answered by a non-consistent safety approach across Member States.

## **3 Objectives**

The general objectives of the Basic Regulation are to establish and maintain a high uniform level of civil aviation safety in Europe. The additional objectives stated in the Basic Regulation are the promotion of cost-efficiency and level playing in the regulatory and certification processes. This proposal will contribute to the overall objectives by addressing the issues outlined in section 2.

The specific objectives of this proposal are:

- to ensure that the different types of operations (CAT, NCC and SPO) are safe;
- to ensure a level playing field among helicopter operators;
- to define offshore operations by taking into account the evolution in the business; and
- to ensure appropriate oversight by the regulators (NAAs) to support the safety objectives.



## 4 Identification of options

A set of options were developed to meet the objectives. The options are further expanded in the subchapters below.

**Table 12 – Selected policy options**

<b>Option No</b>	<b>Description</b>
<b>0</b>	<b>Do nothing – this refers to the baseline scenario described in section 2 ‘Issue analysis and risk assessment’.</b> Operations may continue as governed by EU regulations, and Member States may continue to introduce additional national requirements including national specific approval for CAT.
<b>1</b>	<b>Rulemaking to adjust and update regulations to address the associated risks to helicopter offshore operations</b>
<b>2</b>	<b>Rulemaking as in option 1 and additionally to introduce a requirement for a specific approval for helicopter offshore operations</b>

### 4.1 General considerations for options 1 and 2

#### 4.1.1 Definition of offshore operation

As already explained above, the Agency considers that offshore operations are all flights over open sea areas to a location in the sea in accordance with the following amended definition of offshore operations.

‘Offshore operations’ means a helicopter operation that has a substantial proportion of any flight conducted over open sea areas to or from an offshore location for the purpose of:

- (a) support to offshore oil, gas and mineral exploration, production, storage and transport;
- (b) support to offshore wind turbine and other renewable energy sources;
- (c) support to marine lights; or
- (d) sea-pilot transfer.

#### 4.1.2 Overview of the main changes proposed by option 1 and option 2

Options 1 and 2 will initiate changes to the current regulations as indicated in the table below.

**Table 13 — Additional rules for option 1 and 2**

<i>Additional rules</i>	<i>CAT</i>	<i>NCC</i>	<i>SPO</i>
<b>OPTION 1</b>			
Operational procedures, equipment, training	Yes	Yes	Yes
VHM and FDM	Yes	No	No
Flight following system	Yes	No	Yes
<b>OPTION 2</b>			
Option 1 + special approval	Yes	Yes	Yes

##### Option 1

Option 1 provides a harmonised definition for hostile environment, offshore operations and offshore location.

It also clarifies and updates requirements such as 'Landing and take-off PC-2 procedures at offshore locations', operational procedures, training requirements, and the minimum number of safety equipment to be installed or carried on helicopters for CAT, NCC, and SPO offshore operations.

##### Option 2

In order to propose a safe regulatory framework in line with the current practices of the Member States where most of the offshore operations are currently taking place, and in addition to the items mentioned for option 1, a specific approval for operators performing CAT, NCC and SPO helicopter offshore operations is defined to ensure that the minimum requirements are followed by the operators and appropriate oversight is ensured by competent authorities.

The following table details the origin of the draft regulations for Specific Approvals (SPA)

**Table 14 — List of regulations included in Part-SPA, Subpart K**

<b>Rules for Part-SPA specific approvals</b>		<b>Origin of the rule</b>			
		Part-			New
		CAT	NCC	SPO	
SPA.HOFO.100	Helicopter offshore operations				X
SPA.HOFO.105	Operational procedures				X
SPA.HOFO.110	Use of offshore locations				X
SPA.HOFO.115	Selection of aerodromes and operating sites	X			
SPA.HOFO.120	Flight data monitoring (FDM) programme				X
SPA.HOFO.125	Flight following system				X
SPA.HOFO.130	Airborne radar approach (ARA) for offshore locations	X			
SPA.HOFO.135	Meteorological conditions	X	X	X	
SPA.HOFO.140	Wind limitations for operations to offshore locations	X			
SPA.HOFO.145	Performance requirements — take-off and landing at offshore locations	X			X
SPA.HOFO.150	Equipment requirements	X	X	X	
SPA.HOFO.155	Additional equipment for operations in a hostile environment	X	X	X	
SPA.HOFO.160	Vibration health monitoring system				X
SPA.HOFO.165	Crew requirements				X

## 5 Methodology and data requirements

### 5.1 Applied methodology

#### 5.1.1 General approach for the analysis

The analysis was developed along the following steps:

- (a) identify the safety risks for the different types of helicopter offshore operations (commercial, non-commercial and specialised operations);
- (b) establish the related mitigating procedures or required equipment (including new technology either available or in use by some Member States);
- (c) identify the level of coverage of the safety risks offered by the current regulation;
- (d) identify implementation or level playing field issues;
- (e) define the objectives to address the issues;
- (f) propose options to cover the issues;
- (g) assess the impacts of these options (see section 5.1.2 for more details); and
- (h) select the best option for each type of helicopter offshore operation.

A safety risk matrix was developed to cover the items (a) to (c) (see Annex A).

#### 5.1.2 Assessment of the options

When full monetisation is not possible, the multi-criteria analysis methodology allows the comparison of all options by scoring them against different criteria, also called types of impacts like safety, economic, etc., as shown below.

The term 'multi-criteria analysis' (MCA) covers a wide range of techniques that share the aim of combining a range of positive and negative impacts into a single framework to allow easier comparison of scenarios. Essentially, it applies cost-benefit analysis to cases where there is a need to present impacts which contain qualitative, quantitative and monetary data, and where there are varying degrees of certainty.

The objective of this rulemaking activity has been outlined in chapter 3. The options have been described above and will be analysed in the following chapter for each of the assessment areas. The criteria (i.e. type of impacts) used to compare the options were derived from the Basic Regulation and the guidelines for the Regulatory Impact Assessment as developed by the European Commission<sup>36</sup>:

- (a) safety impact,
- (b) environmental impact,
- (c) social impact,
- (d) economic impact,
- (e) proportionality issues, and

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<sup>36</sup> [http://ec.europa.eu/governance/impact/commission\\_guidelines/commission\\_guidelines\\_en.htm](http://ec.europa.eu/governance/impact/commission_guidelines/commission_guidelines_en.htm)

- (f) regulatory coordination and implementation.

The impacts have been assessed with an easy and intuitive scoring approach to indicate the potential outcome of an option regarding a specific impact:

- + : positive impact,
- 0 : neutral impact,
- : negative impact.

### **5.1.3 Data requirements**

The rulemaking group took into account studies related to helicopter offshore operations, relevant accident/incident data, and information on affected operators and fleet. Questionnaires and databases were used to get additional information not provided by these studies.

- (a) A questionnaire sent to AGNA via CIRCA on 31 March 2011 where in question 2 the Member States were asked to identify the number of CAT helicopters utilised in offshore operations. The rulemaking group requested additional but similar information from Member States that didn't respond to the questionnaire in order to define a helicopter offshore fleet.
- (b) The HELICAS databases were used in addition to the AGNA questionnaire to cross-check and provide supplementary data regarding the offshore helicopter fleet when possible.
- (c) 'Helicopter Safety Study 3' provided safety data and risk areas related to offshore helicopter operations.
- (d) 'Helicopter Safety in the Oil and Gas Business': a study that provided risk areas related to offshore helicopter operations.
- (e) EASA safety analyses were utilised to cross-check some safety data from the two studies mentioned above and to provide the latest safety events.

## 6 Analysis of impacts

The identified options for offshore operations are discussed separately for CAT, NCC and SPO in the subchapters below.

### 6.1 General consideration

The previous sections indicate that the majority of helicopter offshore operations are performed as CAT by 14 operators representing 6 Member States. This corresponds with the Agency's understanding of the situation and provides sufficient material for the impact assessment.

The Agency has only limited knowledge of non-commercial and aerial work operations (SPO). SPO and non-commercial operations are therefore assessed according to theoretical models.

### 6.2 Safety impact

With option 0, the current high safety risks identified in section 1 will continue with an uncommon regulatory approach on safety requirements. These safety risks could even increase if a CAT operator can be authorised to operate in the North Sea by a Member State having lower requirements. If non-commercial operations or SPO operations are performed offshore according to the EU rules, an impact on safety will be seen due to the lower safety requirements applicable for these operators. Those safety requirements don't mitigate all the identified risks.

With option 1, minimum safety requirements are applicable to all operators. However, safety risks might remain if appropriate authority oversight is not assured by issuing a prior approval allowing the operation. Therefore, the safety impacts may vary between negative and positive.

With option 2, a specific approval for all types of operations will provide a higher certainty that the safety risks are mitigated and properly overseen.

**Table 15 – Safety impact**

<i>Safety impacts</i>	<i>Option 0</i>	<i>Option 1</i>	<i>Option 2</i>
CAT, SPO and NCC operations	–	–/+	+

### 6.3 Environmental impact

Not applicable.

### 6.4 Social impact

Option 0

CAT

Option 0 'Do nothing' means that Member States can continue to introduce additional national requirements for CAT that ensure an adequate safety level for operators certified by them. At the same time, these measures might be seen as protectionism from external operators, or even from other national operators not yet flying offshore. Free movement might be limited.

An operator from a Member State solely following EU CAT rules might operate in a Member State having additional national requirements. The operator would

operate to lower safety standards and thereby lower costs than national operators from the Member State having additional requirements. This operator would benefit from lower costs while staff would work with a lower job quality which might put their life in danger.

National operators following high safety requirements would lose activities taken over by operators from Member States solely following EU CAT rules. While it could be expected that there would be a transfer of staff between these two types of operators, this would not happen without staff being concerned about their job quality and salaries.

Therefore, the social impact of option 0 'Do nothing' is considered negative.

#### *SPO and NCC*

These operations are not affected as nothing is changed.

#### Option 1

Option 1 means that as identified safety risks would be mitigated, a higher EU safety standard than what is the case with option 0 would be introduced.

#### *CAT*

The common EU requirements would limit the negative social impact identified in option 0 because all operators will have to follow the same rules. Operators from Member States with operations in the North Sea area already operating in accordance with these requirements will therefore not experience a social impact.

Operators from Member States that do not follow the requirements established for operations in the North Sea area would face an increase in standards. But as offshore operations are conducted at a limited scale outside the North Sea, the social impacts are considered to be limited.

#### *SPO*

Operations must be performed according to stricter standards. Working conditions for pilots will change; the impact on more or less employment cannot be evaluated. However, salary, working hours and social benefits could be affected. The extent of operations is not precisely known, but as it is considered to be low, the social impact is also considered to be low.

#### *NCC*

NCC operations must be performed according to stricter standards. If the operator and helicopter are not compliant with these standards, such operations cannot be conducted. As there are only very few flights today, the impact is very limited.

#### Option 2

Option 2 means that all operators will need to obtain a specific approval. This will ensure that the draft rules are commonly implemented. Social concerns remain as in option 1.

**Table 16 – Social impacts**

<i>Social impacts</i>	<i>Option 0</i>	<i>Option 1</i>	<i>Option 2</i>
CAT, SPO and NCC operations	–	–/+	–/+

## 6.5 Economic impact

### Option 0

#### CAT

Option 0 'Do nothing' means that an operator from a Member State solely following the EU CAT rules might operate in a Member State having additional national requirements for its operators. The operator would operate to lower safety standards and thereby costs than national operators from the Member State having additional requirements. National operators following high safety requirements would lose activities taken over by operators from Member States solely following EU CAT rules. Overall the level of operations would remain stable and would be performed with lower costs.

Overall, the impact could be seen positive in terms of lower costs for the same level of operations. However, these lower costs could be offset by the increase in accidents as explained in the safety impacts analysis (section 2.3). Moreover, the negative social impact explained above will also have to be accounted for.

#### SPO and NCC operations

Option 0 'Do nothing' does not introduce any impact as nothing is changed.

### Option 1

Option 1 'Rulemaking to adjust and update regulations to address the associated risks to offshore operations' means that identified safety risks would be mitigated; a higher harmonised EU safety standard compared to option 0 would be introduced.

#### CAT

As option 1 is globally in line with the national rules from the Member States where most of the offshore operations take place, the economic impact is limited to the operators of those Member States not applying already such safety requirements. It is assumed that these operators will have at least to cope with the new requirements for VHM, FDM and flight following system. The draft rules foresee appropriate transition periods for VHM and FDM.

#### SPO

There is not sufficient data to define the extent of offshore aerial work activities. Additional equipment may already be required at national level, but the extent to which these operators are impacted cannot be determined. Based on the data presented above, the activities are in any case very limited. The economic impact is therefore considered to be limited as well.

#### NCC

Non-commercial operators would see an increase in costs due to the installation of additional equipment. However, as there are not many non-commercial operations no significant economic impact is expected.

To summarise, most of the offshore operations are today performed as CAT operations in Member States having similar rules as the one proposed with this NPA. There might be significant impact for CAT operators of Member States which do not apply the current safety standards that are set in the Member States where most of the offshore operations take place. However, they account for 10 % of offshore operations only.

The impact for SPO and NCC operators might be significant. However, the extent of these operations is very limited.



Overall, the economic impact is therefore considered neutral for CAT and negative for SPO and NCC.

## Option 2

### CAT

Option 2 'Rulemaking as in option 1 and additionally to introduce a requirement for a specific approval for offshore operations' adds an additional approval and oversight mechanism. Member States having a large offshore sector already issue an approval. Competent authorities therefore have already the appropriate staff for certification and continuous oversight in place. This might not be the case for Member States where offshore operations represents only a marginal activity of the overall aviation sector. However, the impact is considered to be limited as it is not expected that suddenly a large offshore sector would emerge in these Member States. The impact of option 2 is therefore considered to be neutral.

### SPO

It is the Agency's understanding that the rules and conditions for SPO operations vary largely between Member States. According to the data presented above, the offshore activities are very limited. An approval may facilitate free movement of operators as it demonstrates the compliance with safety standards. SPO operators might be enabled to offer their service more easily in several MS. This would be a positive economic impact. Yet, SPO operators will have to comply with more stringent requirements and go through a certification process. Depending on the rules in place today in MS, this could be considered as being more stringent; thus, representing a negative economic impact. Overall, the economic impact is considered to be neutral.

### NCC

Non-commercial operators would see an increase in costs as they not only have to comply with additional requirements, including additional equipment installations but will have to undergo also a certification process. As some MS seem to require a CAT AOC for any offshore operation the impact may be neutral or slightly positive as only specific offshore requirements will have to be complied with in the future but not all of the CAT requirements. It may also be argued that industry has established already best practices which are being close to the proposed requirements in this NPA. For non-commercial operators not having implemented such best practices or being subject to an AOC oversight scheme the impact is negative. Nevertheless, as non-commercial operations only represent a marginal activity the impact is overall limited. NCC is therefore classified as having a slightly negative impact.

**Table 17 — Economic impacts**

<i>Economic impacts</i>	<i>Option 0</i>	<i>Option 1</i>	<i>Option 2</i>
CAT, SPO and NCC operations	+	-/0	-/0

## 6.6 Proportionality issues

### Option 0

Option 0 'Do nothing' does not provide for a level playing field nor does it appropriately mitigate the identified risks. The rules are therefore not considered proportionate.

## Options 1 and 2

These options appropriately address the safety risks that are present to a helicopter operator that has to fly to or from an offshore location. Moreover, the proposal aims at addressing new types of operations that so far were not very common, e.g. offshore wind farming. Proportionality is built in by taking into account the basic rule set an operator will have to comply with, i.e. Part-ORO/-CAT/-NCC/-SPO and by limiting some of the provisions, i.e. VHM and FDM to CAT operators and flight following to CAT and SPO operators. Nonetheless, the requirements to obtain a Part-SPA approval are similar for all operators. Apart from the common identified safety risks, it is considered that this is justified by the fact that flights are carried out on the same routes/in the same areas having possibly consequences on the smooth operation of the whole system. Concerning proportionality those 2 options are rated slightly negative.

**Table 18 – Proportionality impacts**

<i>Proportionality impacts</i>	<i>Option 0</i>	<i>Option 1</i>	<i>Option 2</i>
CAT, SPO and NCC operations	–	–	–

**6.7 Impact on regulatory coordination and harmonisation**

Regulatory coordination and harmonisation with FAA or TCCA is not considered necessary as operations are in sea areas adjacent to the Member States and not transatlantic flights. Furthermore, the operating environment in the Gulf of Mexico is considered considerably different from the North Sea.

## Option 0

At global level, regulatory compliance with ICAO Annex 6 — Part III, Section II is today ensured. There is no change with option 0.

At European level, the very different level of national regulations is likely to remain divergent in option 0 with the risks identified above in terms of safety, social and economic impacts.

## Option 1

Option 1 will ensure common European requirements for all offshore operations. Nevertheless, this option is not fully in line with the Member States which require a specific approval for some types of offshore operations. These Member States account for the ones where the majority of the offshore operations take place.

## Option 2

Option 2 will ensure that the NAAs oversight is being conducted in accordance with a standard set of regulations. The confidence of an appropriate regulatory implementation is therefore reinforced with option 2. In addition, this is in line with the practice of Member States which require a specific approval for some types of offshore operations.

**Table 19 – Regulatory coordination and harmonisation impacts**

<i>Regulatory coordination and harmonisation impacts</i>	<i>Option 0</i>	<i>Option 1</i>	<i>Option 2</i>
CAT, SPO and CC operations	–	+	+

## 7 Conclusion and preferred option

**Table 20 – Overall impacts per type and per option**

<i>Types of impact</i>	<i>Option 0</i>	<i>Option 1</i>	<i>Option 2</i>
Safety	–	–/+	+
Social	–	–/+	–/+
Economic	+	–/0	–/0
Proportionality	–	–	–
Regulatory coordination and harmonisation	–	+	+
<b>Overall impacts</b>	–	<b>–/0</b>	<b>0/+</b>

### 7.1 Preferred option

Option 2 'Rulemaking to adjust and update regulations to address the associated risks to offshore operations and additionally to introduce a requirement for a specific approval' will ensure to maintain the current high safety level achieved by the Member States where most of the offshore operations take place. In addition to option 1, it will ensure the necessary level of oversight. Moreover, it caters for any operations other than CAT and provides a proportionate approach to safety.

## **Annex A      Risk and mitigation measures in helicopter offshore operations**

This matrix identifies mitigating measures and recommendations for rule change.

The recommendation is either 'Develop rule (or similar)' or 'No further action by this RMT', the latter referring to whether the risk to be mitigated is already sufficiently addressed by existing rules or the mitigation action is outside the scope of the rulemaking task (RMT).

The term 'No further action by this RMT' does not indicate that the associated risk is not valid, but that it is outside the scope of this RMT.

No	Risk factors	Mitigation measures	Comments	Action
<b>Collision/Loss of control</b>				
1	Collision with movable offshore installations due to reposition or new arrivals.	Establish (similar) database and require mandatory position updates for movable installations with height above 200 feet.  Operate at higher altitude.  Use radar to avoid targets.	Partially mitigated with the introduction of Automatic Identification System (AIS).  Otherwise outside the scope.	No further action by this RMT.
2	In-flight collision.	Improved information (ATC) service.  Change to a higher airspace category.  Dedicated route structure.  Use different altitudes and/or tracks to and from offshore installations (offshore route system)  Flight following system (radar, ADS-B, similar).  Ensure quality accuracy of NAV database.  ACAS/TCAS/similar.	Partly outside the scope (ATC, airspace and routes) and partly covered elsewhere (see flight following system).  RMT.0376 addressing ACAS/TCAS (start 2013).	Develop rule to ensure quality accuracy of NAV database.  Develop rule to ensure offshore route system unless defined by NAAs.
3	Bird strike.	Avoid areas of heavy bird congestion.  Install 'bird safe' windscreens to withstand birds in question.	Certification requirement. Outside the scope.  Criteria in CS-29 define collision at VNE with a 1 kg bird. A standard North Sea seagull (Great Black-backed gull) is in excess of 2,2 kg.  Initial airworthiness informs that the ATKINS study (2009) on bird strike risks concludes that bird strike requirements in CS-29 provide an adequate level of safety.	No further action by this RMT.
4	Collision or hazards in relation to offshore windmill parks.	Operators should adjust operating area, routes, en-route altitudes and approach headings or heights.	Issue for operators.  Note that operations to wind farms are defined as offshore operations.	Include in AMC to Operating procedures
5	Collision with sky sail cables or sky sails.	Operators should: — seek all possible information to the	Issue for operators.	Include in AMC to Operating procedures

No	Risk factors	Mitigation measures	Comments	Action
		whereabouts of potential sailing routes where sky sails are utilised; — inform crew about the danger; — develop procedures to mitigate the introduced risk (transition altitudes, alternative routing, no-fly zones and similar).		
6	Collision hazard during low level IFR/IMC operations.	Operators should define a minimum altitude for operations under IMC.	Issue for operators.	Include in AMC to Operating procedures
7	Collision with water.	Operators should: — introduce stabilised approaches; — refine CRM training; — define lowest safe cruising altitude; — install alarm systems detecting possible CFIT.	Issue for operators. Available Terrain Awareness Warning Systems are not suited for helicopter offshore operations as they often trigger false alarms.	Include in AMC to Operating procedures
8	Controlled flight into the sea when operating in darkness.	Operators should: — perform operations in darkness only after risk assessment; — introduce stabilised approaches; — establish training programmes for night operations.	Issue for operators.	No further action by this RMT.
9	Controlled flight into the sea.	Rad. Alt. should be updated towards more sophisticated warnings. Require TAWS when available.	Describe Rad. Alt. requirements in new AMC.	Develop AMC to CAT.IDE.H.145 Radio Altimeter
10	Collision with military or similar operators.	Regulatory use of SSR transponder for military, state and similar aircraft when in conflict with offshore helicopter traffic. Offshore Class G airspace should be upgraded to a higher level to stop unauthorised traffic.	Outside the scope.	No further action by this RMT.
11	Obstacles in the approach path to offshore installations.	Operators should introduce limitations to the Helideck Limitation List when obstacles form a threat in the approach path.	Issue for operators.	No further action by this RMT.
12	Loss of control (collision) during operations on movable offshore	Operators should decide on: — pitch/roll limitations; — enhanced training; — weather and light	Outside the scope. Issue for operators.	No further action by this RMT.

No	Risk factors	Mitigation measures	Comments	Action
	installations.	conditions when operations can be performed; — avoiding operations on movable helideck.		
13	Loss of control when performing operations to a moving helideck.	Operators should: — define pitch, roll, and heave limitations (including acceleration); — limit payload (helideck limitation list); — avoid operations in darkness.	Issue for operators.	No further action by this RMT.
14	Loss of control during operations to small helidecks (less than 1D) without sufficient hover references.	Operators shall establish criteria for operations. Consider requiring larger helideck (e.g. 1,25D) for all weather and night operations.	Provisions are specified in CAA UK CAP 437 Standards for offshore helicopter landing areas and ICAO Annex 14, Volume 2.	Include in AMC to Operating procedures
15	Post-crash fire when operating to unmanned platforms without firefighting equipment.	Operators should introduce operational limitations for operations to unmanned installations without firefighting equipment.  Deck integrated firefighting system (DIFFS) should be required for all normally unmanned platforms.	Issue for operators.	Include in AMC to Operating procedures
16	Post-crash fire.	Require rupture-resistant fuel tanks.	Certification requirement.	No further action by this RMT.
<b>Evacuation</b>				
17	Sea state causing capsizing after ditching.	Operators should: — limit helicopter operation corresponding to the sea state each helicopter type is designed or demonstrated to withstand; — consider hostile environment when sea state is above designed/demonstrated values; — include information on sea state to flight planning;  Helicopters should be certified for stability and buoyancy required in a realistic environment (sea state 6 or higher).  Additional emergency	CAT.IDE.H.320  Some manufacturers will no longer include approval value for sea state.  RMT.0120 is addressing airworthiness issues related to post ditching and water impact.	No further action by this RMT.

No	Risk factors	Mitigation measures	Comments	Action
		floatation gear to secure escape routes remain above water to make evacuation possible. Automatic inflation systems should be installed on the aircraft when available for the aircraft type.		
18	Drowning after capsizing.	Define a minimum water/sea temperature for offshore flying. Introduce emergency breathing apparatus (EBA) plus training for crew. Mandate more/better protective clothing. Require equipment that prevents capsizing.	Type III exit and ETSO already cover certification aspects. Survival equipment already regulated and water temperature is included. RMT.0120 is addressing post ditching and water impact.	No further action by this RMT.
19	Non-standard escape hatches.	When an approved modification exists, emergency pop-out windows should be installed.	Certification requirement for new helicopters.	Include in AMC to operational requirements.
20	Difficult to see emergency exits in darkness or when submerged.	Install emergency exit lighting system. Ensure opening mechanism is visible under expected conditions.	Already in CAT.IDE.H.310, NCC.IDE.H.231, SPO.IDEH.201.	Provisions transferred to SPA.HOFO.
21	Loss of visual references during darkness and in low winds in high pitch hover attitude.	Operators may introduce maximum pitch attitudes in hover or limit operations.	Issue for operators.	No further action by this RMT.
22	Evacuation after ditching.	Operators should establish training to include: — realistic evacuation training from an upright floating helicopter model or similar; — mandatory helicopter underwater escape training (HUET) without exemption possibilities.	Issue for operators. Conducted by industry for passengers and in some Member States also for crew.	Include in training requirements.
23	Opening of emergency exits.	Establish a regulatory requirement for standardised release mechanism on emergency exits. (Not mentioned in CS-29) Emergency pop-out windows should be required.	Certification requirement. RMT.0120 'Ditching occupant survivability' is in effect. Rulemaking group informed on this risk.	Include in training requirements.
24	Unable to launch or utilise life rafts.	Introduce reversible or self-righting life rafts.	Already addressed in RMT.0120.	No further action by this



No	Risk factors	Mitigation measures	Comments	Action
		<p>Introduce double chambered life rafts.</p> <p>Introduce externally mounted life rafts deployable internally or externally.</p> <p>Documented ability to launch and board life rafts in weather conditions under which the helicopter is approved (sea state, etc.).</p>		RMT.
25	Hazard from different configuration of otherwise similar helicopters.	Operators should seek configurative standardisation of otherwise similar helicopters, especially related to optional equipment installation (e.g. internal life rafts vs. emergency exits).	Issue for operators.	No further action by this RMT.
26	Not sufficient survival equipment for offshore operations in extreme conditions.	<p>Offshore-specific survival kits that at a minimum comply with local regulatory standards are to be carried and packed into the aircraft life rafts.</p> <p>Additional kit/equipment should be conceived for extreme cold weather operations.</p>	Covered in CAT.IDE.H.305, NCC.IDE.H.230, SPO.IDE.H.200.	No further action by this RMT.
<b>Human performance</b>				
27	Insufficient control of human operational performance.	<p>Increase training for critical phases of flight.</p> <p>Introduce/enhance CRM and MCC training/education.</p> <p>Improve selection and education of instructors.</p> <p>Improve quality of delivered training.</p> <p>Increase standardisation and check flights.</p> <p>Require use of flight data monitoring (FDM) to observe effect of training and efficiency of established procedures.</p>	FDM for helicopters currently available and should be utilised by CAT operators using helicopters equipped with recorders.	Develop rule for FDM and training.
28	Fatigue due to equipment in use.	<p>Operators should introduce:</p> <ul style="list-style-type: none"> <li>ergonomics during cockpit design;</li> <li>new seats to old (and new) helicopters;</li> <li>active or passive noise reduction to a defined level;</li> <li>crew survival suits made</li> </ul>	<p>Issue for operators.</p> <p>Outside the scope.</p>	No further action by this RMT.

No	Risk factors	Mitigation measures	Comments	Action
		also for normal use; • individually adjustable ventilation/air-condition system; • design requirements for armrests, lumbar support, leg support, vibration absorption, height, fore and aft, tilt adjustment, etc.		
29	Flight crew incapacitation in flight.	MCC/CRM and recurrent training/procedures.	Already mandated.	No further action by this RMT.
30	Reduced operational competence due to retirement of existing personnel.	Define a minimum competence level at entry into service. Define/standardise training programmes. Define minimum CRM and human factor education. Ensure transfer of experience to younger pilots. Monitor performance (FDM).	FDM covered in SPA.HOFO. Other items: Issue for operators.	No further action by this RMT.
31	Improper use of automatic flight control systems (AFCS) by crews.	Enhance appropriate procedures and training. Use simulators for training and checking. Enhance standardisation flights. Use FDM to verify crew performance.	Ref.: UK CAA Safety Notice Number: SN-2011/017.	Include in SPA.
32	Danger of landing on the wrong platform.	Operators should establish procedures to identify the destination before landing is performed.	Issue for operators.	No further action by this RMT.
33	Loose documents in the cockpit are posing a risk during heavy turbulence or emergency landing.	Stow documents.	Issue for operators.	No further action by this RMT.
<b>Procedures and guidance</b>				
34	Insufficient authority oversight.	Ensure that sufficient authority requirements for oversight are in place. This could include additional approval requirements to enhance oversight due to the high risk of offshore operations.	Part-ARO includes general requirements for oversight and certification of AOC holders. Specific approval (SPA) is not in place.	Develop SPA for offshore operations.
35	Insufficient/lack of procedures for offshore	Require procedures for stabilised approaches and	Major operators have introduced	Included in proposed SPA.

No	Risk factors	Mitigation measures	Comments	Action
	approaches.	approach monitoring.	procedures.	
36	Lack of contact with helicopter when outside radar range thus risking longer rescue time.	<p>Operators should:</p> <ul style="list-style-type: none"> <li>— reduce time intervals between position reports;</li> <li>— make use of a flight following system acceptable to the operator's needs;</li> <li>— install flight following system.</li> </ul> <p>EASA should:</p> <ul style="list-style-type: none"> <li>— require installation of an acceptable flight following system;</li> <li>— consider introducing ADS-B of a defined standard in all helicopters and major offshore installations.</li> </ul>	Partly issue for operators, partly issue for EASA.	Develop rule for flight following systems.
37	Flight plan change requests to close to scheduled departure.	Operators to define procedures and avoid last-minute changes.	Issue for operators.	No further action by this RMT.
38	Insufficient/lack of procedures for IFR or night offshore approaches.	<p>Operators should:</p> <ul style="list-style-type: none"> <li>— assess conditions and mitigate defined risks;</li> <li>— establish approach and departure procedures;</li> <li>— reduce night operations if there is lack of procedures;</li> <li>— consider multi-crew operations at night;</li> <li>— ensure helideck and lighting status is available for crew to determine operational limitations;</li> <li>— introduce minimum weather conditions for night shuttling: <ul style="list-style-type: none"> <li>• minimum wind speed,</li> <li>• maximum crosswind,</li> <li>• maximum wind variation,</li> <li>• minimum helideck size,</li> <li>• minimum helideck obstacle clearance,</li> <li>• sea surface lights under the platform;</li> </ul> </li> <li>— ensure appropriate training and recency requirements;</li> </ul>	<p>Issue for operators.</p> <p>Training and use of simulators are covered in new regulations for training.</p>	Include in training requirements and in hazard assessment.

No	Risk factors	Mitigation measures	Comments	Action
		— establish minimum experience requirements.		
39	Lack of approach guidance to offshore landing.	Introduce an automatic approach function to helicopters. Introduce a visual guidance system (A-VASI).	System trials for approach guidance in progress.	No further action by this RMT.
40	Insufficient meteorological service for offshore flights.	Improve service. Ref.: ICAO Doc 8896	Outside the scope.	No further action by this RMT.
41	Complicated SOP-calls in critical phases of flight.	Operators: — SOPs should not be too complex with different calls for the same action. — SOPs should not describe too many options for a certain situation especially when close to a decision point.	Issue for operators.	No further action by this RMT.
42	Imprecise navigation performance.	Approve GPS as primary navigational aid for offshore operations. Introduce B-RNAV based on GPS. Follow requirements for airspace used.	Outside the scope.	No further action by this RMT.
43	Navigational aids to offshore installations.	Approval for differential GPS (DGPS) for offshore approaches. Approval of radar equipment used for ARA.	Outside the scope.	No further action by this RMT.
44	Imprecise passenger safety briefing.	The following aspects (but not limited to) are to be provided via video brief prior to boarding the aircraft for both onshore and offshore legs: — demonstration on the use of the life jackets used in that helicopter; — briefing on the proper use of survival suits, including the need to have suits fully zipped with hoods and gloves ON during take-off and landing or otherwise advised by the pilot-in-command/commander; — demonstration of life raft deployment and boarding; — demonstration of deployment of all	The safety briefing is of vital importance for the passengers, and repetition of essential information regarding safety equipment and behaviour has proven to be necessary.	Included in SPA.HOFO.

No	Risk factors	Mitigation measures	Comments	Action
		survival equipment; — boarding and disembarkation instructions.		
45	SMS not used in risk validation.	National authorities to accelerate requirement for SMS implementation (air operator safety policy, safety case, reporting system, etc.).	Implemented through Part-ORO.	No further action by this RMT.
46	MEL (not customised to operations)	Operators: to establish MEL customised to offshore operations.	Issue for operators.	No further action by this RMT.
<b>Systems</b>				
47	System degradation or possible loss of control after lightning strike.	Operators to ensure avoidance of operations in lightning conditions.	Improved prediction system now being trialled by the UK Met Office.  Detection, prediction and avoidance of lightning are issues to be considered.	No further action by this RMT.
48	Failure of rotor systems or flight controls.	Introduce new helicopter types with latest available technology.  Utilise VHM values.  Upgrade or modify to higher technical standard.  Design precautions that must be taken to minimise the hazards in the event of an engine failure (disc separation, etc.).  Use active vibration damping.	Certification requirement.  Outside the scope.  VHM addressed elsewhere in this matrix.	No further action by this RMT.
49	Insufficient dry run capability of gear boxes.	Introduce dry run capability similar to point of equal time (PET).  Introduce minimum proven dry run of 30 minutes at cruise speed.	Certification requirement.  Outside the scope.	No further action by this RMT.
50	Technical faults in flight (drivetrain, engines, controls, etc.) necessitating a forced landing.	Require simulator training regarding technical faults.		Include in training requirements.
51	Insufficient helicopter engine performance.	Operators should use helicopters with sufficient engine performance for missions to be undertaken.	Certification requirement.  Issue for operators.  Outside the scope.	No further action by this RMT.
52	Lack of	Standby instruments should	Covered by rules.	No further

No	Risk factors	Mitigation measures	Comments	Action
	independent power sources for essential or standby instruments.	have an independent power source. Maximum distance from a suitable landing site should be linked to the life of the power source.		action by this RMT.
53	Failure of components or systems due to fatigue risk.	Require installation and use of vibration health monitoring (VHM).  Operators: — to introduce shorter periods between maintenance checks; — to limit operations over water in time and to daylight.	Mandate VHM. (VHM (HUMS) is nationally required by NO and UK)  Otherwise: Issue for operators.	Develop rule for VHM.
54	Degraded technical functions.	Apply human factor concept in maintenance. Initiate CRM and human factor training. Initiate technical continuation training programme. Manufacturers must evaluate/perform criticality analyses of maintenance programmes to ensure suitability.	Refer to Opinion 06/2012 Alignment of Regulation (EC) NO 2042/2003 with Regulation (EC) No 216/2008. Otherwise outside the scope.	No further action by this RMT.
55	Insufficient HUMS data interpretation.	Operators: Improve training for involved personnel. Improve HUMS database. Modify HUMS to also register vibrations felt by the crew. If possible separately on the left and right-hand sides. Advanced anomaly detection (AAD) may be the way forward.	Issue for operators.	No further action by this RMT.
56	Unable to communicate with passengers.	The helicopter shall be fitted with a PA system of sufficient clarity and volume so that passengers are capable of understanding instructions from the crew at all times during flight.	Required for + 9 pax. CAT.IDE.H.180 Relevant for NCC. Not relevant for SPO	Included in SPA-HOFO.
57	Lack of passenger-crew communication.	Operators may consider a means by which the passengers are able to communicate with the crew.	Issue for operators. This could be a two-way headset to a designated passenger. However, in the hands of the wrong passenger it may become a hazard in itself.	No further action by this RMT.

No	Risk factors	Mitigation measures	Comments	Action
<b>Training</b>				
58	Insufficient training for emergency situations.	Operators should ensure: <ul style="list-style-type: none"> <li>— realistic simulator training regarding CRM and severe emergencies;</li> <li>— occurrence reports and AFM are used when composing the training/checking programmes.</li> </ul>	Issue for operators.	Include in training requirements.
59	Insufficient crew training in ditching procedures.	Operators: Run ditching procedures in simulators.	Issue for operators. Also included in training requirements for SPA.HOFO	Include in training requirements.
60	Insufficient offshore-related training.	Require the establishment of training requirements including the use of simulators focusing on: <ul style="list-style-type: none"> <li>— night operations including shuttle;</li> <li>— offshore approaches and departure (day and night);</li> <li>— severe situations and emergency procedures;</li> <li>— technical faults;</li> <li>— ditching procedures (in simulator);</li> <li>— realistic evacuation training;</li> <li>— helicopter underwater escape training (HUET);</li> <li>— CRM;</li> <li>— recurrent training.</li> </ul>	Establish training requirements.	Establish rule.
61	Offshore installation radio service not standardised.	Operators (Manager Ground OPS) shall ensure the quality of services provided from offshore landing areas. Introduce/require training in radio procedures and similar when required.	Outside the scope.	No further action by this RMT.
62	Insufficient or incorrect information from helideck landing officer (HLO) function.	Operators (Manager Ground OPS): Require sufficient training and standard or HLO function.	Issue for operators.	No further action by this RMT.
<b>Weather conditions</b>				
63	Wind speed that jeopardises safe handling of passengers and cargo at offshore destinations.	Limit helicopter operation above a defined wind speed for passenger embarking offshore.	A limit based on best practice and industry standard is in effect for CAT.	Regulation in CAT transposed to SPA.HOFO
64	Loss of control due to icing.	Operators: Use of aircraft with certified de-icing/anti-icing systems.	Already covered by AFM and in Part-CAT/-NCC/-SPO.	No further action by this RMT.

No	Risk factors	Mitigation measures	Comments	Action
		Avoid operations in areas of icing. Define icing prone areas and use rotor anti-icing equipment for operations conducted in defined icing prone areas. Adhere to flight manual (RFM) limitations.		
65	Fear of accidents due to heavy precipitation, lightning, poor visibility, etc.	Operators to introduce limitations/guidelines which preclude flying if weather conditions are too hostile.	Issue for operators.	No further action by this RMT.
66	Visibility during approach/departure restricted by precipitation.	Operators should ensure helicopters are suitable for the operations undertaken.	Issue for operators.	No further action by this RMT.
67	Chin windows fogged.	Operators should introduce a requirement or method for chin window demisting for weather conditions in which operations are conducted. Air conditioning is known avoid situation to develop.	Issue for operators.	No further action by this RMT.



## **Annex B Identified risks in helicopter safety studies**

### **Helicopter Safety Study 3 (HSS-3)**

#### Contributing factors to risk reduction in the period 1999–2009

According to the report, the most important contributing factors to risk reduction in the period 1999–2009 have been:

- gradual introduction of new helicopter types and the implementation of the latest generation of helicopter technology;
- improved use of health and usage monitoring systems (HUMS)/vibrating health monitoring (VHM);
- increased pilot skill by added requirements regarding competence, experience and simulator training on Norwegian continental shelf (NCS) operations;
- improved flight operational procedures;
- improved helideck design and operations through requirements and active use of Oljeindustriens Landsforbund<sup>37</sup> (OLF) helideck manual and guidelines;
- improved emergency preparedness (personal locator beacons (PLB), impact absorption, rescue suits, more rescue helicopters);
- introduction of safety management system (SMS); and
- establishment of the Committee for Helicopter Safety on NCS.

#### Contributing factors to risk reduction in the period 2010–2019

According to the report, the most important contributing factors to risk reduction in the period 2010–2019 are expected to be the following planned improvements:

- continued introduction of new helicopter designs and implementation of a new generation of helicopter technology;
- increased technical operational experience with the new helicopter types (in particular S-92 and EC225);
- further development, updates and increased use of HUMS/VHM;
- further development of flight data monitoring (FDM) and SMS;
- increase in engine performance compared to helicopter weight (introduction of Performance Class 2 Enhanced (PC2e));
- improved safety standards of helidecks (procedures, size, lighting equipment, marking, monitoring of helideck motions, weather reports, and turbulence knowledge); and
- improved meteorological services.

#### Potential threats for helicopter safety in the period 2010–2019

According to the report, the most important potential threats for helicopter safety in the period 2010–2019 are considered to be:

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<sup>37</sup> The Norwegian Oil Industry Association.

- lack of the possibility to maintain established Norwegian additional requirements for offshore flights, or that it will not be possible to introduce new requirements adapted to the conditions on NCS;
- exemption from offshore special requirements and deviation from recommended guidelines;
- unwanted consequences from changes implemented by helicopter operators and other players in this area;
- reduced competence among technicians and pilots in helicopter companies due to retirement of existing personnel;
- lack of competence and resources regarding offshore helicopters in CAA-N; and
- too much focus on cost and revenues by the different players on NCS.

#### Recommendations for further improvement of safety

Provided that the already planned improvements are implemented, the report concludes with the following recommendations for further improvement of safety (items are not prioritised):

- improve safety regarding approach helideck operations;
- reduce the probability of technical failures;
- improve the management of organisational changes and changes in the internal framework conditions;
- increased use of proactive safety indicators;
- improve interaction between the operators involved in offshore helicopter transport;
- develop and maintain technical and operational competence;
- reduce the risk of lightning strikes and their possible consequences on helicopters;
- minimise exemptions from requirements and recommended guidelines;
- evaluate measures to reduce perceived risks; and
- follow up and implement the recommendations presented in this report.

### **Helicopter safety in the oil and gas business (IADC<sup>38</sup>/SPE<sup>39</sup> 988672)**

#### Contributing factors to risk reduction in the period 1995–2006

To achieve the safety goals industry has introduced a range of mitigating programmes over the last 11 years (i.e. 1995–2006):

- development of industry standard for aviation safety management system (SMS);
- quality assurance in maintenance;
- development of operating, maintenance and training standards to minimise human error and changing the culture. This includes:
  - simulator training including crew resource management (CRM) and line oriented flight training (LOFT);
  - human factor training for operational and maintenance personnel;

<sup>38</sup> IADC: International Association of Drilling Contractors.

<sup>39</sup> SPE: Society of Petroleum Engineers.

- requirement for duplicate inspections;
- HUMS on contracted or owned aircraft;
- underwater egress trial, development of helicopter underwater escape training (HUET) standards;
- development of improved aircraft performance standards and standardisation of take-off and landing profiles;
- introduction of helicopter operation monitoring programme (HOMP);
- progressive upgrade of equipment in helicopters (TCAS, AVAD/EGPWS); and
- adopting industry's best practice for management of helideck operations.

#### Contributing factors to further risk reduction

It is recommended that, in order to achieve the industry's defined safety goal, oil and gas producers (OGP) companies should:

- (a) commit to the implementation of the OGP Aircraft Management Guide that supports:
  - (1) transition to new aircraft built to the latest design standards on new contracts;
  - (2) requirement for annual training in flight simulators to practise crew coordination during emergency procedures;
  - (3) fitting of all helicopters with vibration & health and engine monitoring systems such as HUMS/VHM/EVMS;
  - (4) fitting of all helicopters with EGPWS or TAWS and TCAS;
  - (5) requirement for operators to implement quality and safety management systems;
  - (6) requirement for operators to implement FDM/HOMP; and
  - (7) requirement for operators to fly profiles that minimise the risk of engine failure.
- (b) Work together to ensure that:
  - (1) manufacturers support HUMS/VHM/EVMS and the latest design standards (FAR 29-47);
  - (2) operators adopt proven global best practices as their minimum standard; and
  - (3) regulators support proven global best practices, including HUMS/VHM/EVMS.