European Aviation Safety Agency — Rulemaking Directorate

Notice of Proposed Amendment 2014-19

Helicopter Height-Velocity (H-V) limitations

RMT.0132 & RMT.0515 (27&29.027) — 25.7.2014

EXECUTIVE SUMMARY

This Notice of Proposed Amendment (NPA) addresses a regulatory issue related to Commercial Air Transport (CAT) with large helicopters performing performance class 2 (PC2) operations where the Height-Velocity (H-V) envelope may be penetrated. This is typically the case during take-off and landing at offshore locations, public interest sites and in hostile environment outside a congested area.

This NPA proposes amendments to Regulation (EU) No 965/2012 and EASA Certification Specifications to Large Rotorcraft (CS-29) to allow penetration of the H-V envelope during the take–off and landing phases of PC2 operations.

Applicability	
Affected regulations and decisions:	Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures to Regulation (EC) No 216/2008 of the European parliament and of the Counsil. Certification Specifications for Large Rotorcraft (CS-29)
Affected stakeholders:	Operators of CS-29 certified helicopters performing performance class 2 (PC2) operations, especially to offshore helideck.
Driver/origin:	EASA
Reference:	N/A

Process map	
Concept Paper:	No
Terms of Reference:	7.1.2013
Rulemaking group:	Yes
RIA type:	Light
Technical consultation during NPA drafting:	Yes
Duration of NPA consultation:	3 months
Review group:	TBD
Focussed consultation:	No
Publication date of the Opinion (RMT.0515):	2015/Q4
Publication date of the Decision (RMT.0132):	2016/Q4

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1. Procedural information

1.1. The rule development procedure

The European Aviation Safety Agency (hereinafter referred to as the 'Agency') developed this Notice of Proposed Amendment (NPA) in line with Regulation (EC) No 216/2008[1] (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure[2].

This rulemaking activity is included in the 4-year Rulemaking Programme under RMT.0132 & RMT.0515 (27&29.027).

The text of this NPA has been developed by the Agency based on the input of the Rulemaking Group RMT.0132 & RMT.0515 (27&29.027). It is hereby submitted for consultation of all interested parties[3].

The process map on the title page contains the major milestones of this rulemaking activity to date and provides an outlook of the timescale of the next steps.

1.2. The structure of this NPA and related documents

Chapter 1: Procedural information related to the task.

Chapter 2: Explanatory note on the core technical content.

Chapter 3: Proposed text for the new requirements.

Chapter 4: References to affected IR, AMC and GM.

Chapter 5: Appendices.

1.3. How to comment on this NPA

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

The deadline for submission of comments is **27 October 2014.**

1.4. The next steps in the procedure

Following the closing of the NPA public consultation period, the Agency will review all comments.

The outcome of the NPA public consultation will be reflected in the respective Comment-Response Document (CRD).

The Agency will publish the CRD information with the Opinion.

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1 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).

2 The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See 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 Decision No 01-2012 of 13 March 2012.

3 In accordance with Article 52 of the Basic Regulation and Articles 5(3) and 6 of the Rulemaking Procedure.

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

The Opinion based on this NPA and the outcome of the consultation will contain the proposed changes to EU regulations and will be addressed to the European Commission to be used as a technical basis in order to prepare a legislative proposal. The Agency expects to publish the Opinion in 2015/Q4.

The European Commission will use the Opinion in order to prepare an EU regulation. Following the adoption of this regulation, the Agency will issue a Decision containing the related Acceptable Means of Compliance (AMC)/Guidance Material (GM) (RMT.0132).

2. Explanatory Note

2.1. Issue

2.1.1. What is the Height-Velocity envelope?

Introduction

The Height-Velocity (H-V) envelope is best described as a graphical combination of all pressure altitudes and temperatures for which take-off and landing are approved, and for weights from the maximum at sea-level to the maximum for hover out of ground effect and for forward velocity, including hover, under which a safe landing cannot be made following an engine failure.

The magnitude of the H-V envelope is dependent on the helicopter's performance. For all types, however, in a given operational theatre, variation of the helicopter weight (mass) has the dominant influence on the magnitude of the H-V envelope.

Some aircraft flight manuals (AFMs) present H-V envelopes with variables for altitude and temperature included, allowing pilots to insert the experienced values and thereby knowing whether or not operations will be performed inside the H-V envelope. Other AFMs present conservative H-V envelopes based on worst case scenarios. These are not allowing pilot calculations and are very limiting to operations.

Certification specifications for large rotorcraft (CS-29)

For large helicopters, certified to Category A, the H-V envelope is an AFM limitation according to CS-29. Hence, operations cannot be performed with planned masses resulting in an entry into the H-V envelope. In general terms, PC2 take-off and landing operations at confined areas (offshore helideck, etc.) will encounter operational limitations ranging from small to extremely limiting.

In addition, CS-29 allows multi-engined helicopters to be certified as both Category A and Category B with appropriate and different operating limitations for each category. However, the same paragraph indicates that Category B operation, in which the H-V envelope is performance information, is limited to large helicopters with less than ten passenger seats. An increase in the number of passenger seats would require the H-V envelope to become an operating limitation also for Category B operations.

PC2 operations with an approval to operate without an assured safe forced landing capability are affected. In addition, all operators are prevented from utilising helicopters with more than nine passenger seats for Category B operations.

This is explained in more detailed in 2.1.3 'Assessing the regulatory domains'.

Certification specifications for small rotorcraft (CS-27)

Small helicopters are not affected by limitations imposed by the H-V envelope. CS-27 states that multi-engined helicopters may be certified as Category A provided certain defined requirements are met. Containing the H-V envelope as an AFM operational limitation is not such a requirement. Operations with small helicopters are therefore not further discussed.

2.1.2. Performance class 2 operations

Helicopter take-offs and landings, especially at offshore installations but also in hostile environment outside a congested area and at public interest sites, have been conducted with masses infringing the height-velocity (H-V) envelope. While this type of operation constitutes a risk to individual flights, risk assessment procedures are in place to minimise the risk through enhanced engine reliability and power unit failure rate monitoring. Operators and authorities consider this procedure to be the safest operational concept for such operations.

Taking into account this operational practice, the former JAA introduced the concept as performance class 2 (PC2) in JAR-OPS 3. PC2 operations at offshore installations, in hostile environment outside a congested area and at public interest sites are characterised by a vertical take-off to a defined height followed by acceleration through a defined speed. Associated landings decelerate through the same speed followed by a vertical descend to the landing area. An engine failure at a speed lower than the defined one may necessitate a forced landing.

JAA also introduced a Category A certification requirement for helicopters operating according to PC2 (JAR-OPS 3.515[5]). Helicopters certified under CS-29 or the related previous airworthiness codes are required to include the HV-envelope in the aircraft flight manual (AFM) limitation section. The H-V envelope thereby became an operational AFM limitation for large helicopters.

The JAA acknowledged that these changes to JAR-OPS 3 hampered or introduced limitations to take-off and landing for the operations mentioned above. It, therefore, introduced alleviation in Appendix 1 to JAR-OPS 3.005(c) allowing momentary flight through the H-V envelope the alleviation required Authority approval to operate without a forced landing capability according to JAR-OPS 3.517. Alleviations for PC2 operations in hostile environment outside a congested area and at public interest sites were defined in Appendix 1 to JAR-OPS 3.005(e) and Appendix 1 to JAR-OPS 3.005(i). In addition to the requirement for prior Authority approval, the maximum approved passenger seating configurations were limited to 9 and 6 respectively.

In addition, PC2 regulations for take-off and landing allowed operations which were not within the scope of Category A. This constituted a regulatory mismatch with the Category A certification requirement. This was not further approached by the JAA.

Until the opt-out period for Regulation (EU) No 965/2012[6] ends on 28 October 2014, PC2 operations according to JAR-OPS 3, including the alleviation allowing momentary flight through the H-V envelope, may continue. However, since Appendix 1 to JAR-OPS 3.005(c) was not transposed into Regulation (EU) No 965/2012 the alleviation cannot be maintained from this date. This is due to the fact that Annex IV (essential requirements), paragraph 4.a of the Basic Regulation require compliance with certification limitations. The Implementing Rules cannot exempt from the essential requirements and it seems anyway obvious that helicopters should not be operated outside certification limitations. The HV-diagram thereby represents a certification limitation.

Regulation (EU) No 965/2012 includes paragraphs specific for PC2, however, without an alleviation allowing momentary flight through the H-V envelope.

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[5] See complete text in section 5.

[6] 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.

2.1.3. Assessing the regulatory domains

The primary issue is to determine how large helicopters may continue PC2 operations according to the procedures presently in use, in which the H-V envelope may be penetrated briefly when operationally required.

This will require assessment of the Basic Regulation and two regulatory domains, operational requirements and certification specifications. It should be noted that operational regulations cannot alleviate against airworthiness limitations, and neither operational regulations nor airworthiness limitations can alleviate against the Basic Regulation.

(a) Basic Regulation

Annex IV, paragraph 4.a establishes the following:

'An aircraft must be operated in accordance with its airworthiness documentation and all related operating procedures and limitations as expressed in its approved flight manual or equivalent documentation, as the case may be. The flight manual or equivalent documentation must be available to the crew and kept up to date for each aircraft.'

Furthermore, Annex IV, paragraph 8.b establishes the following:

'The operation for commercial purposes and the operation of complex motor- powered aircraft must only be undertaken in accordance with an operator's operation manual. Such manual must contain all necessary instructions, information and procedures for all aircraft operated and for operations personnel to perform their duties. Limitations applicable to flight time, flight duty periods and rest periods for crew members must be specified. The operations manual and its revisions must be compliant with the approved flight manual and be amended as necessary.'

The Agency has, therefore, stated and maintains the position that the Basic Regulation shall not be validated for a possible text change.

(b) Regulation (EU) No 965/2012 (Operational regulations)

PC2 regulations cannot include an alleviation regarding penetration of the H-V envelope if it is a certification limitation. The following assessment, therefore, explains how the regulations should be changed so that the H-V envelope may be penetrated while respecting the certification limitations.

(1) CAT.POL.H.300 General

This is the introduction paragraph to PC2 operations:

'Helicopters operated in performance class 2 shall be certified in Category A or equivalent as determined by the Agency.'

The regulatory statement incorporates the H-V envelope as an operational limitation through the Category A certification.

This, however, contradicts definitions in Annex I to Regulation (EU) No 965/2012 and to the PC2 related paragraphs CAT.POL.H.315 'Take-off flight path' and CAT.POL.H.325 'Landing'.

(2) Annex I — Definitions

Two points in space, 'Defined point before landing' (DPBL) and 'Defined point after take-off' (DPATO) are defined exclusively for PC2.

- *'DPBL' means the point within the approach and landing phase, after which the helicopter's ability to continue the flight safely, with the critical engine inoperative, is not assured and a forced landing may be required.*
- *'DPATO' means the point, within the take-off and climb phase, before which the helicopter's ability to continue the flight safely, with the critical engine inoperative, is not assured and a forced landing may be required.*

As a consequence, for a flight regime after DPBL or prior to DPATO a rate of climb or the maintenance of level flight are not required following an engine failure, and a forced landing may be required.

(3) CAT.POL.H.315 'Take-of flight path[7]' and CAT.POL.H.325 'Landing'[8]

Both paragraphs state that obstacle clearance requirements, with the critical engine inoperative during take-off or during a balked landing, shall be complied with at or after DPATO. Prior to that neither a rate of climb nor a requirement to maintain level flight is required, and a forced landing may be required.

The Annex I 'Definitions' and the paragraphs CAT.POL.H.315 and CAT.POL.H.325 indicate that PC2 operations require an one-engine-inoperative (OEI) obstacle clearance regime to be established after DPATO and prior to DPBL for the climb, cruise, decent, approach and missed approach phases. This part of a flight is within the scope of the Category A certification requirements.

But an all-engines-operating (AEO) obstacle regime for the landing phase after DPBL and take-off phase prior to DPATO is accepted as an engine failure may necessitate a forced landing. Flight regimes subsequent to DPBL and prior DPATO are therefore not within the scope of Category A according to the definitions in Annex I.

CAT.POL.H.300 contradicts CAT.POL.H.315 and CAT.POL.H.325 in relation to operations with an approval to operate without an assured safe forced landing capability, hence not within the scope of Category A. The paragraph has therefore been highlighted for a possible text change to fulfil the objective for the RMT.

(c) Certification specifications for large rotorcraft (CS-29)

The specifications cannot include an alleviation regarding penetration of the H-V envelope, as any change would be contrary to the Category A philosophy. The following assessment therefore explains that all multi-engined helicopters may be certified as both Category A and Category B with appropriate and different operating limitations for each category.

(1) CS 29.1 Applicability[9]

29.1 (b) states that multi-engined helicopters may be certified both Category A and Category B with appropriate and different operating limitations for each category.

However, subsequent sub-paragraphs limit this statement.

- 29.1 (c) requires helicopters with MTOM[10] above 9072 kg and more than 9 passenger seats to be certified to Category A.

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7 See complete text in section 5.
8 See complete text in section 5.
9 See complete text in section 5.

- 29.1 (e) allows helicopters with MTOM below 9072 kg but more than 9 passenger seats to be certified to Category B but with additional requirements, including H-V envelope as an operational limitation.

The two items may be interpreted that all large helicopters with more than 9 passenger seats shall include the H-V envelope as an AFM operating limitation independent of certification category.

(2) CS-29.1587 Performance information[11]

Sub-paragraph (b)(6) to this paragraph requires the H-V envelope to be included in the AFM performance section for Category B certified helicopters, except for those incorporating it as an operating limitation.

This may be related to CS 29.1(c) and (e) above, and is therefore interpreted to require large offshore helicopters to include the H-V envelope as an operating limitation.

CS 29.1 and CS 29.1587 have therefore also been highlighted for possible text changes to fulfil the objective for the RMT.

2.1.4. Who is affected?

CAT operators with an approval to perform PC2 operations without an assured safe forced landing capability with large, multi-engined helicopters are affected as an entry into the H-V envelope is not allowed under EU law.

All operators performing Category B operations with large, multi-engined helicopters with more than 9 passenger seats are affected as the H-V envelope is currently stipulated in the AFM as an operational limitation.

2.1.5. Safety risk assessment

The Agency is aware of one offshore accident[12] caused by an engine failure during PC2 take-off before DPATO. In addition, two onshore accidents caused by power loss are known[13] and involved large helicopters performing HEMS and CAT operations. These presumably occurred prior to DPATO and subsequent to DPBL, however, this cannot be substantiated. There is also uncertainty as to whether or not the helicopters were inside the H-V envelope, and as to which operational regulations the flights were conducted.

The overall majority of accidents during PC2 operations have happened after DPATO and prior to DPBL. This is in the flight regime where sustained flight is available following an engine failure, and it is not associated with H-V envelope penetration.

Accident statistics or trends are, therefore, not indicating that PC2 operations approved without an assured safe forced landing capability should be planned with masses under which the H-V envelope is not penetrated.

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10 Maximum take-off mass (weight)

11 CS-29.1587 'Performance information' sub-paragraph (b)(6) is included in section 5.

12 11.06.2011, F-HJCS Sikorsky S-76C++, in Andaman Sea. OEI during take-off and subsequent hard landing in the sea.

13 03.06.2003, SP-ZXO PZL Swidnik MI-2 in Poland. Gear-box failure at 20 metres height during take-off. Landed initially in trees and fell thereafter to the ground damaging the helicopter.

18.04.2007, OY-HGZ Sikorsky S-61N, at Greenland. OEI 5 seconds before landing. Go around not possible. Hard landing substantially damaging the helicopter.

If regulations are maintained as they are, PC2 helicopter operations will be affected differently depending on the type of helicopter. Avoiding the H-V envelope requires reduction of landing or take-off masses for some helicopters types whilst others are prevented from operating. Any reduction in take-off and landing masses will dictate the need for more flights to fulfil a given operation and transport the given amount of passengers. As accident rates are related to flight hours, it may be assumed, or feared, that an increase in flights hours may result in a higher risk for accidents.

With an increased number of flights, the time frame for operations may be expanded to include flights in periods of darkness. It should, in this respect, be noted that the window of daylight is dependent on seasonal variations and on the latitude of the operating area. Again, this is a typical offshore operation issue. Operation in darkness is considered by the industry to have a higher safety risk than similar operations in daylight. This also reflects the passengers and working unions view.

Required mass reduction may be searched for in other areas than pay-load. Therefore, regulatory requirements for fuel calculation, reserve fuel and alternative aerodrome selection may be challenged.

The change in operations may not initiate a high risk scenario, but operational and statistical challenges which are not seen today are introduced.

Furthermore, an economical element (or risk) is introduced when the required reduction of pay-load reaches a magnitude rendering some helicopters economically unsuitable for the job they were previously suitable for. A similar situation arises for helicopters were the H-V envelope does not allow pilot calculations and thereby precludes further operations.

Even if economical and safety risks are not equally weighted, the effect is clearly not the intention of Regulation (EU) No 965/2012.

2.1.6. How could the issue/problem evolve?

By doing nothing prior to the end of the opt out period, PC2 operations will be forced into an operating regime which was not foreseen or expected in relation to Regulation (EU) No 965/2012. Category A H-V envelope limitations may move the operating regime towards a requirement for hover performance with one engine inoperative out of ground effect to avoid the H-V envelope. This may be seen as an individual flight safety improvement, but it will constitute a scenario where large helicopters operate with a low number of passengers, in some cases a very low number. More flights are required to accommodate all passengers and load. Assuming the accident rates from all causes remains constant, the risk for more accidents may increase. If the operational 'window' is expanded to include night operations which are not preferred by the operators, then it can be further postulated that the risk for more accidents may increase even higher.

Any increase in the number of accidents in the offshore industry is likely to see an increased level of concern being raised by passengers, industry, staff representation and political groups.

2.2. Objectives

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

The specific objective is to allow flights to momentarily penetrate the H-V envelope during PC2 take-off and landing when operationally necessary, and thereby, allow operations to continue according to procedures presently used. As previously stated, this requires changes to, and harmonisation between Regulation (EU) No 965/2012 and CS-29. It is important that Regulation (EU) No 965/2012 includes a requirement allowing helicopters operated according to PC2 to be certified to Category A and Category B, and the different certification limits to be utilized in relation to DPATO and DPBL. It is similar important that CS-29 allows all multi-engined helicopters to be certified to both Category A and B with different limitations for each category.

In addition, the ToR 27 & 29.027 (RMT.0132 & RMT.0515) requires that possible changes to Part-NCC and Part-SPO are assessed. PC2 operations are only defined for Part-CAT. But, as stated in 2.1.2, CS-29 requires the H-V envelope to be an operational limitation for Category B operations with large helicopters having more than 9 passenger seats. Regulation (EU) No 965/2012 Parts (Annexes) cannot be changed to alleviate against this. The problem area is, however, already covered in the specific objective (above). If CS-29 allows all multi-engined helicopters to be certified to both Category A and B with different limitations for each category, the seating limitation becomes obsolete for such certified helicopters, since the design aspects of Cat A (engine and system isolation features) would have been met, and the safety objective associated with the number of the passengers could better be addressed through operational rules. It should, however, be noted that some Parts of Regulation (EU) No 965/2012 include seating limitations.

2.3. Policy options

The Agency has received several suggestions for policy options to allow penetration of the H-V envelope for a short period of time when operationally necessary during PC2 take-off and landing.

(1) Change the Basic Regulation to allow deviations from the AFM when applicable.

(2) Change CS-29 to introduce an alleviation permitting penetration of the H-V envelope during PC2 operations.

(3) Change CS-29 to move the H-V envelope from the limitations section to the performance section in the AFM.

(4) Change CS-29 to allow Category B operations with the H-V envelope as performance information.

(5) Change AFM to include a supplement for helicopter offshore operations in which the H-V envelope is not a limitation.

(6) Change Regulation (EU) No 965/2012 to allow dispensation from the AFM limitations to allow short time penetration of the H-V envelope during PC2 take-off and landing.

(7) Change CAT.POL.H.300 in Regulation (EU) No 965/2012 to recognise Category B certification and to allow its limited use for take-off and landing.

2.3.1. Screening process

The suggested policy options were screened in relation to the governing regulations to assess their validity.

Suggestion 1:

Change the Basic Regulation to allow deviations from the AFM when applicable.

Even if it is possible to include a paragraph in the Basic Regulation allowing dispensation or alleviation from the AFM limitations, the Agency has decided not to because respecting the airworthiness limitations is an accepted general principle which should be maintained.

By retaining this principle, the Basic Regulation, Annex IV, paragraphs 4.a and 8.b, as quoted in 2.1.3 (a), remains in effect.

In the Agency's view this suggestions cannot be further considered.

Suggestion 2:

Change CS-29 to introduce an alleviation permitting penetration of the H-V envelope during PC2 operations.

This suggestion is based on a similar alleviation given in FAR 91.9(4). The legislative conditions are not similar between FAA and EASA. CS-29 is not the appropriate place to introduce a derogation based on operational motivations.

In the Agency's view this suggestions cannot be further considered.

Suggestion 3:

Change CS-29 to move the H-V envelope from the limitations section to the performance section in the AFM.

Moving the H-V envelope from limitations to performance criteria goes against the Category A certification philosophy and would be a non-trivial change. Furthermore, changing CS-29 in such a way would create a substantial difference with the similar FAA certification requirements, and may impact on type-validation and acceptance by foreign authorities.

It should also be noted that to obtain the expected effect of the suggestion, Category A take-off and landing weights would also need to be required transposed from limitations to performance criteria. This would go against the regulatory desire and trend towards encouraging more powerful helicopters with full Category A engine failure accountability.

In the Agency's view this suggestions cannot be further considered.

Suggestion 4:

Change CS-29 to allow category B operations with the H-V envelope as performance information.

This is already current certification practice where a large rotorcraft is certified as both Category A and B.

The suggestion is accepted as an option by the Agency for further impact analysis.

Suggestion 5:

Change AFM to include a supplement for helicopter offshore operations in which the H-V envelope is not a limitation.

Where a Flight Manual Supplement has been used in the past, it has generally been in addition to the basic AFM.

Creating one specifically for helicopter offshore operations would require alleviations from Category A certification specifications such as H-V envelope and take-off and landing weights.

There must be a requirement for a supplement, which would either require a change to CS-29 or development of a special condition, such as was used for SAR. A special condition would not be applicable in this case, as the Agency's intent is not to reduce the applicable airworthiness standard and create 'Rulemaking by Special Conditions'. The effect of this may lead to a downgrade of the design criteria, which is also not the Agency's intent.

Furthermore, the suggestion is only addressing offshore operations.

In the Agency's view, this suggestions cannot be further considered.

Suggestion 6

Change Regulation (EU) No 965/2012 to allow dispensation from the AFM limitations to allow short time penetration of the H-V curve during PC2 take-off and landing.

Regulation (EU) No 965/2012 cannot include a paragraph allowing dispensation or alleviation from airworthiness criteria defined in the AFM as it would be in conflict with the Basic Regulation.

In the Agency's view this suggestions cannot be further considered.

Suggestion 7:

Change paragraph CAT.POL.H.300 in Regulation (EU) No 965/2012 to recognise Category B certification and to allow its limited use for take-off and landing.

The suggestion is accepted as an option by the Agency for further impact analysis.

2.3.2. Selected policy options

Based on the screening process, the Agency accepted two suggestions (No 4 and 7) as options for further impact analysis. These are combined and defined as Option No 1.

In addition option No 0 is included as baseline option.

Option No	***Short title***	**Description**
0	Do nothing	Baseline option representing the current situation and no rulemaking. The current PC2 take-off and landing operations are maintained until 28 October 2014. Thereafter, they are forced into a different operating regime since Regulation No 965/2012 as all operations must be carried out in accordance with the limitations of the AFM. The risks remain as outlined in the issue analysis.
1	Change Regulation (EU) No 965/2012 and EASA CS-29	Rulemaking to amend; • Paragraph CAT.POL.H.300, to recognise Category B certification and to allow its limited use for take-off and landing. • CS 29.1 and CS 29.1587 to allow category B operations with the H-V envelope as performance information.

2.4. Analysis of impacts

2.4.1. Safety impact

Option No 0:

The safety risk assessment concludes that an increased number of flights required by the change in operations may result in an increased risk for accidents and fatalities.

Option No 1:

A safety impact is not expected as the regulatory solution would allow continuation of the present situation.

2.4.2. Environmental impact

Option No 0:

An increased number of flights will contribute to more emissions to the atmosphere and more noise over a longer portion of the day.

Option No 1:

An environmental impact is not expected as the regulatory solution would allow continuation of the present situation..

2.4.3. Social impact

Option No 0:

An increased number of flights may lead to extra workload on those involved, or to the hiring of more staff members. In both cases the effect may be negative or positive.

Option No 1:

A social impact is not expected as the regulatory solution would allow continuation of the present situation.

2.4.4. Economic impact

Option No 0:

An increased number of flights may require extra helicopters or more extensive use of the present ones, which will increase costs as it will require to hire more staff members.

Some helicopters may no longer be used, rendering the company unable to fulfil contractual commitments, or facing investment in new helicopters. Both options have an economic impact.

Accurate economic impacts cannot be calculated.

Option No 1:

An economic impact is expected as the regulatory solution would allow continuation of the present situation.

2.4.5. General aviation and proportionality issues

General aviation is not affected.

Option No 0:

Proportionality may be disturbed when the present procedures must be substituted by new procedures. Operators may be negatively, positively or not affected by this, depending on the types of helicopters used.

Option No 1:

Proportionality is maintained as the regulatory solution would allow continuation of the present situation.

2.4.6. Impact on 'Better Regulation'

Option No 0:

An impact is not seen.

Option No 1:

An impact is not seen.

2.5. Comparison and conclusion

2.5.1. Comparison

Option No 0 demonstrates that a forced change of the operational concept for take-off and landing will introduce negative and unwanted effects.

Option No 1 demonstrates that introducing amendments to CAT.POL.H.300, CS 29.1 and CS 29.1587 will allow operations to continue unchanged.

2.5.2. Conclusion

Option No 1 fulfils the RMT objectives are is therefore the preferred option.

2.5.3. The way forward

The Agency is aware that there will be a time gap between the end of the opt-out period for Regulation (EU) No 965/2012 and the adoption of the Opinion resulting from this RMT. During this time frame PC2 operations with the approval under CAT.POL.H.305 to operate without an assured safe forced landing capability will be affected as the alleviation to momentarily penetrate the H-V envelope is no longer available.

To bridge the time gap, the Agency will, as the NPA is submitted for public consultation, inform the Member States that exemptions under Article 14 (4) of the Basic Regulation are expected to ensure continuation of present operations.

The Agency will introduce an amendment to CS-29 as soon as possible after the NPA is submitted for public consultation. The changes envisaged to CS-29 will apply to all future helicopter applications for type certification. For in-service helicopter types to take advantage of the change in operational rules, the AFM for some helicopter types may require voluntary revision to incorporate the proposed changes introduced into CS-29. This information will also be provided to the Member States.

The RAG, TAG and SSCC will also be informed of the content of this NPA.

Furthermore, the Agency will convey information on the NPA at helicopter related workshops and meetings.

2.6. Overview of the proposed amendment

The Agency proposes to introduce amendments to:

- CAT.POL.H.300 General;
- CS 29.1 Availability; and
- CS 29.1587 Performance information.

In addition, the Agency is aware of minor errors being introduced to CAT.POL.H.310 'Take-off' and CAT.POL.H.325 'Landing' once they were transposed from JAR-OPS 3. The Agency, therefore, proposes to amend the paragraphs to their original text used in JAR-OPS 3.

2.6.1. CAT.POL.H.300 General

It is proposed to change the paragraph to include a requirement for Category B certification in addition to the requirement for Category A or similar certification for operations where an assured safe forced landing capability during the take-off and landing phases are not maintained. Operations in accordance with Category B limitations, in which the H-V envelope is not included, will be available only for the landing, balked landing and take-off phases, or more precisely, to the flight regime after DPBL and prior to DPATO. The remaining part of the flight shall be performed in accordance with Category A certification limitations. This is within the context of the definitions of DPBL and DPATO in Annex I, and governing regulations for PC2 take-off and landing (CAT.POL.H.305, 310, 315 and 325) as they do not contain an obligation to respect Category A limits after DPBL and prior to DPATO. The amendment aligns CAT.POL.H.300 with the mentioned Annex I definitions and PC2 paragraphs, and ensures its validity for large helicopters.

An accompanying AMC regarding Category B limitations will be included.

This allows continued operations to the operating procedures in force today. It also fulfils the objective defined for the RMT.

2.6.2. CS 29.1 Availability

It is proposed to change the paragraph to ensure that multi-engined helicopters may be certified both Category A and Category B with appropriate and different operating limitations for each category.

For helicopters with MTOM greater than 9072 kg and 10 or more passenger seats, it is already stated in CS 29.1(c) that Category A approval is required.

Clarification is given that only helicopters certified solely to Category B are affected by the additional limitations which are normally associated with Category A. Where a Category B approval is a stepping stone before gaining a Category A approval, the additional Category A limitations will not be applied as part of the Category B approval. Helicopters with MTOM greater than 9072 kg but with less than 10 passenger seats (CS 29.1(d)) and helicopters with MTOM less than 9 072 kg but with more than 10 passenger seats are within this regulatory frame.

This allows all large multi-engined helicopters to be type certified as both Category A and Category B with appropriate and different operating limitations, as defined in CS 29.1(b). This aligns with the change to CAT.POL.H.300, and ensures that the objective defined for the RMT is fulfilled.

An accompanying AMC regarding certification standards will be included.

2.6.3. CS 29.1587 Performance information

A change to the paragraph itself is not proposed, but an AMC to sub-paragraph (b)(6) is included. The AMC will clarify that for helicopters certified to both Category A and Category B the H-V envelope is a limitation only when operating according to Category A, and is performance information when operating according to Category B. This fulfils the objective defined for the RMT.

2.6.4. CAT.POL.H.310 Take-off

It is proposed to amend the paragraph to the original text used in JAR-OPS 3 by deleting the word 'or' which has been included after item (c)(1). This is not according to the original text in JAR-OPS 3 and it introduces a different and not intended understanding of the paragraph. Furthermore, the abbreviation AEO has been wrongly transcribed and is therefore proposed to be corrected.

2.6.5. CAT.POL.H.325 Landing

It is proposed to amend the paragraph to the original text used in JAR-OPS 3 by deleting the word 'or' which has been included after item (c)(1). This is not according to the original text in JAR-OPS 3 and it introduces a different and not intended understanding of the paragraph.

3. Proposed amendments

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

(a) deleted text is marked with ~~strike through~~;

(b) new or amended text is highlighted in grey;

(c) an ellipsis (…) indicates that the remaining text is unchanged in front of or following the reflected amendment.

3.1. Draft Regulation (Draft EASA Opinion)

3.1.1. CAT.POL.H.300 General

(a) Helicopters operated in performance class 2 shall be certified in Category A or equivalent as determined by the Agency.

(b) Helicopters operated in performance class 2 without an assured safe forced landing capability during the take-off and landing phases shall be certified in both Category A and Category B or equivalent as determined by the Agency.

(c) Operations defined in (b) shall be conducted subject to the AFM limitations of Category A, except prior to the defined point after take-off (DPATO) and after the defined point before landing (DPBL) where Category B limitations may apply.

3.1.2. CAT.POL.H.310 Take-off

(…)

(c) For operations in accordance with CAT.POL.H.305, in addition to the requirements of (a):

(1) the take-off mass shall not exceed the maximum mass specified in the AFM for all engines ~~operative~~ operating out of ground effect (AEO OGE) hover in still air with all engines operating at an appropriate power rating~~: or~~.

(2) for operations from a helideck:

(….)

3.1.3. CAT.POL.H.325 Landing

(…)

(c) For operations in accordance with CAT.POL.H.305, in addition to the requirements of (a):

(1) the take-off mass shall not exceed the maximum mass specified in the AFM for an AEO OGE hover in still air with all engines operating at an appropriate power rating~~: or~~.

(2) for operations from a helideck:

(….)

3.2. Draft AMC, GM and CS (Draft EASA Decision)

3.2.1. AMC1 CAT.POL.H.300 General

(a) UTILISING CATEGORY B LIMITATIONS

Within the area defined in CAT.POL.H.300(c), Category B limitations may only apply if:

(1) a Category A procedure is impractical and the authorised take-off weight and landing masses would penetrate the height-velocity envelope during a performance class 2 take-off or landing; and/or

(2) the available take-off and landing area (FATO) would not allow a safe forced landing following a failure of the critical engine.

(b) TAKE-OFF AND LANDING MASSES

If authorised take-off or landing masses greater than the Category A weight limits are used according to (a), the operator should establish operational procedures in the Operations Manual to ensure mass and climb requirements defined in CAT.POL.310 'Take-off', CAT.POL.315 'Take-off flight path' and CAT.POL.325 'Landing' are maintained.

3.2.2. CS 29.1 Applicability

(a) (…)

(b) (…)

(c) (…)

(d) Rotorcraft with a maximum weight greater than 9 072 kg (20 000 pounds) and 9 or less passenger seats may be type certified as Category B rotorcraft only, provided the Category A requirements of Subparts C, D, E, and F are met.

(e) Rotorcraft with a maximum weight of 9 072 kg (20 000 pounds) or less but with 10 or more passenger seats may be type certified as Category B rotorcraft only, provided the Category A requirements of CS 29.67(a)(2), 29.87, 29.1517, and of Subparts C, D, E, and F are met.

(f) (…)

3.2.3. AMC 29.1 Applicability

Changes to CS 29.1 introduced in CS-29 Amendment XX, clarified the intent regarding eligibility to Category B certification.

CS 29.1(b) allows a multi-engined rotorcraft to be certified as both Category A and Category B with appropriate and different operating limitations for each category.

Prior to CS-29 Amendment XX, the rule could be interpreted that a basic Category B approval was limited to a maximum weight of 9 072 kg (20 000 pounds) or less and nine or less passenger seats (CS 29.1(f)). Any increase in the weight or number of passenger seats above these limitations required enhanced Category B certification standards, which included the Category A engine isolation features and operating limitations (CS 29.1 (d) and (e)).

In CS-29 Amendment XX, clarification was given that CS 29.1(d) and (e) are only applicable where a single Category B approval is being sought. Where a Category B

approval is a stepping stone before gaining a Category A approval, the additional Category A standards will not be applied as part of the Category B approval.

Furthermore, CS 29.1(c) should be interpreted that a single Category B approval is not available.

A multi-engined rotorcraft with Category A and Category B approvals will meet the engine isolation features of Category A. The primary differences will be the gross weight allowed, the H-V limitation, and the surface area required for take-off.

Certification categories available to applicants are summarised in the table below.

		Passenger Seats	
		≤9	≥10
Weight	> 9072kg (20 000lbs)	Category A or Category B (Note 1) or Category A+B	Category A or Category A+B
	≤ 9072 kg (20 000lbs)	Category A or Category B or Category A+B	Category A or Category B (Note 2) or Category A+B

Note 1: Compliance with CS 29.1(d) required.

Note 2: Compliance with CS 29.1(e) required.

3.2.4. AMC 29.1587 (b)(6) Performance limitations

For rotorcraft certified in Category B, the height-speed envelope (H-V) should be provided as performance information in accordance with CS 29.1587(b)(6).

For rotorcraft certified in Category A, CS 29.1517 and CS 29.1583(f) will apply and the H-V should be identified as a limitation.

For rotorcraft certified in Category A and Category B, it is acceptable to retain the H-V in the performance information section of the Rotorcraft Flight Manual provided the H-V is clearly identified as a limitation for Category A in the limitations section.

4. References

4.1. Affected regulations

Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures to Regulation (EC) No 216/2008 of the European Parliament and of the Council, Annex IV, Subpart C, Section 2, Chapter 3 'Performance class 2', paragraph CAT.POL.H.300.

4.2. Affected CS, AMC and GM

Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Part-CAT, new paragraph AMC1 CAT.POL.H.300.

Certification Specifications for Large Rotorcraft (CS-29), Amendment 3, 11 December 2012, paragraphs CS 29.1 and CS 29.1587. Furthermore, in Book 2, AMC 29.1 and AMC 29.1587(b)(6).

4.3. Reference documents

Regulation (EC) No 216/2008 or the European Parliament and of the Council of 20 February 2008

Certification Specifications for Small Rotorcraft (CS-27), Amendment 3, 11 December 2012.

5. Appendices

5.1. Appendix 1 to JAR-OPS 3.005(c) Helicopter Flight Manual limitations

(a) For helicopters certified in Category A, a momentary flight through the height velocity (HV) envelope is allowed during the take-off and landing phases, when the helicopter is operated according to any of the following requirements:

(1) JAR-OPS 3.517; or

(2) Appendix 1 to JAR-OPS 3.005(i); or

(3) Appendix 1 to JAR-OPS 3.005(e).

5.2. JAR-OPS 3.515 General

(a) An operator shall ensure that helicopters operated in performance class 2 are certified in Category A (see also ACJ to JAR-OPS 3.480(a)(1) and (a)(2)).

5.3. JAR-OPS 3.517 Operations without an assured safe forced landing capability

(a) An operator shall be satisfied that operations without an assured safe forced landing capability during the take-off and landing phases are not conducted unless the operator has been granted the relevant approval by the Authority in accordance with Appendix 1 to JAR-OPS 3.517(a) (see also JAR-OPS 3.470(a)(1)).

5.4. CS 29.1 Applicability

(a) This Airworthiness Code is applicable to large rotorcraft.

(b) Large rotorcraft must be certified in accordance with either the Category A or Category B requirements. A multi-engined rotorcraft may be type certified as both Category A and Category B with appropriate and different operating limitations for each category.

(c) Rotorcraft with a maximum weight greater than 9 072 kg (20 000 pounds) and 10 or more passenger seats must be type certified as Category A rotorcraft.

(d) Rotorcraft with a maximum weight greater than 9 072 kg (20 000 pounds) and nine or less passenger seats may be type certified as Category B rotorcraft provided the Category A requirements of Subparts C, D, E, and F are met.

(e) Rotorcraft with a maximum weight of 9 072 kg (20 000 pounds) or less but with 10 or more passenger seats may be type certified as Category B rotorcraft provided the Category A requirements of CS 29.67(a)(2), 29.87, 29.1517, and of Subparts C, D, E, and F are met.

(f) Rotorcraft with a maximum weight of 9 072 kg (20 000 pounds) or less and nine or less passenger seats may be type certified as Category B rotorcraft.

5.5. CS 29.87 Height-velocity envelope

(a) If there is any combination of height and forward velocity (including hover) under which a safe landing cannot be made after failure of the critical engine and with the remaining engines (where applicable) operating within approved limits, a height-velocity envelope must be established for:

(1) all combinations of pressure altitude and ambient temperature for which take-off and landing are approved; and

(2) weight, from the maximum weight (at sea-level) to the highest weight approved for take-off and landing at each altitude. For helicopters, this weight need not exceed the highest weight allowing hovering out of ground effect at each altitude.

(b) For single engined or multi-engined rotorcraft that do not meet the Category A engine isolation requirements, the height velocity envelope for complete power failure must be established.

5.6. CS-29.1587 Performance information

(b) Category B. For each Category B rotorcraft, the Rotorcraft Flight Manual must contain:

….

(6) the height-speed envelope except for rotorcraft incorporating this as an operating limitation;

5.7. CAT.POL.H.315 Take-of flight path

From the defined point after take-off (DPATO) or, as an alternative, no later than 200 ft above the take-off surface with the critical engine inoperative, the requirements of CAT.POL.H.210(a)(1), (a)(2) and (b) shall be complied with.

5.8. CAT.POL.H.325 Landing

(a) The landing mass at the estimated time of landing shall not exceed the maximum mass specified for a rate of climb of 150 ft/min at 300 m (1 000 ft.) above the level of the aerodrome or operating site with the critical engine inoperative and the remaining engine(s) operating at an appropriate power rating.

(b) If the critical engine fails at any point in the approach path:

(1) a balked landing can be carried out meeting the requirement of CAT.POL.H.315; or

(2) for operations other than those specified in CAT.POL.H.305, the helicopter can perform a safe forced landing.

(c) For operations in accordance with CAT.POL.H.305, in addition to the requirements of (a):

(1) the landing mass shall not exceed the maximum mass specified in the AFM for an AEO OGE hover in still air with all engines operating at an appropriate power rating; or

(2) for operations to a helideck:

(i) with a helicopter that has an MOPSC of more than 19; or

(ii) any helicopter operated to a helideck located in a hostile environment,

the landing mass shall take into account the procedure and drop down appropriate to the height of the helideck with the critical engine inoperative and the remaining engine(s) operating at an appropriate power rating.

(d) When showing compliance with (a) to (c), account shall be taken of the appropriate parameters of CAT.POL.H.105(c) at the destination aerodrome or any alternate, if required.

(e) That part of the landing after which the requirement of (b)(1) cannot be met shall be conducted in sight of the surface.