European Union Aviation Safety Agency

Notice of Proposed Amendment 2026-01 (E)

issued in accordance with Article 6 of Management Board Decision 01-2022

Proposed amendments to CS-HPT-DSN

Contents

Proposed amendments

The amendments are presented as follows:

— deleted text is ~~struck through~~;

— new text is highlighted;

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

Where necessary, the rationale is provided in *italics.*

Certification Specifications
and Guidance Material
for
the design of surface-level
~~VFR~~visual heliports located at aerodromes that fall under the scope of
Regulation (EU) 2018/1139
(CS-HPT-DSN)

Rationale

The title of CS-HPT-DSN is amended to replace the term "VFR" with "visual." This revision serves two purposes: first, to align with the terminology used in ICAO Annex 14, Volume II, and second, to avoid inconsistencies arising from the new proposed design specification that are related to the use of PinS approach and departure procedures (e.g. obstacle limitation surfaces).

See also rationale provided for CS HPT-DSN.A.010 and CS HPT-DSN.E.425.

List of abbreviations

(used in CS-HPT-DSN)

[…]	
HAPI	helicopter approach path indicator
HFM	helicopter (aircraft) flight manual (also known as RFM)
[…]	
MTOM	maximum take-off mass
NVIS	night vision imaging systems
OCS	obstacle clearance surface
OLS	obstacle limitation surface
PAPI	precision approach path indicator
PinS	point-in-space
PRP	point-in-space reference point
RFM	rotorcraft flight manual (also known as HFM)
RTOD	rejected take-off distance
RTODAH	rejected take-off distance available (helicopters)
TDPC	touchdown/positioning circle
TDPM	touchdown/positioning marking
TLOF	touchdown and lift-off area
[…]	

Rationale

Proposed addition of several new abbreviations that appear in CS-HPT-DSN.

CHAPTER A — GENERAL

CS HPT-DSN.A.010 Applicability

(a) The certification specifications (CSs) and the related guidance material (GM) (CS-HPT-DSN) are applicable to the design of surface-level ~~VFR~~visual heliports or parts thereof located at aerodromes that fall under the scope of Regulation (EU) 2018/1139.

[…]

Rationale

Several new provisions are proposed for inclusion in CS-HPT-DSN that are related to the use of PinS approach and departure procedures. This is in line with the conclusions of recent aerodromes' Advisory Body meetings, where several Member States requested EASA to act towards the harmonisation with the provisions of ICAO related to heliport design by a suitable transposition of the amendments of Annex 14 Vol. II that were adopted after the first issue of the current CS-HPT-DSN. With the use of PinS procedures, the term 'VFR' as an attribute of the term 'heliports' creates an incompatibility that can be lifted with the use of the attribute 'visual'. It should be mentioned that heliports utilising instrument procedures other than PinS approach or departure procedures are still excluded.

GM1 HPT-DSN.A.010 Applicability

(a) The CSs and the related GM are applicable to the design of surface-level ~~VFR~~visual heliports, including those that are not open for public use or for commercial air transport, which are located at aerodromes that fall under the scope of Regulation (EU) 2018/1139.

(b) The dimensions included in the CS-HPT-DSN are based on consideration of single-main-rotor helicopters. For tandem-rotor helicopters the heliport design can be based on a case-by-case review of the specific models using the basic requirement for a safety area and protection areas specified in the Certifications Specifications.

(c) Several certification specifications, that are relevant to the areas intended to be used exclusively by helicopters within an aerodrome, are not included in the CS-HPT-DSN, but can be found in CS-ADR-DSN. Among these, Chapters M 'Visual aids for navigation (lights)' and N 'Visual aids for navigation (signs)' are of high importance.

Rationale

The substitution of the term 'VFR' with the term 'visual' in the existing GM is proposed to avoid any misconception regarding the applicability of the present CS.

The addition of the second paragraph is proposed for clarity regarding the types of helicopters that the Certifications Specifications are suitable for, and the steps to be followed in case a heliport is intended to be used by tandem-rotor of helicopters.

Point (c) is proposed to be added as a guidance to the heliport designers and operators and to highlight the fact that – since the present CS-HPT-DSN are applicable to heliports within aerodromes – it is

imperative that the CS-ADR-DSN are also considered. See also the rationale under GM1 HPT-DSN.F.628.

CS HPT-DSN.A.020 Definitions

For the purposes of CS-HPT-DSN, the following definitions should apply:

'Ascent/Descent surface' means an inclined plane or complex surface that slopes upward from the centre of the FATO to indicate the path helicopters are expected to follow when vertical procedures are utilized. It can consist of:

— an inverted triangle when there is no lateral component; or

— an inverted conical surface when there is a lateral component.

[…]

~~Note: 'D' is sometimes referred to in the text using the term 'D-value'.~~

'D-value' means a limiting dimension, in terms of 'D', for a heliport or for a defined area within.

'Declared distances' — heliports means:

— Take-off distance available (TODAH). The length of the FATO plus the length of helicopter clearway or elevated helicopter clearway (if provided) declared available and suitable for helicopters to complete the take-off.

[…]

'Design D' means the D of the design helicopter.

'Dynamic load-bearing surface' means a surface capable of supporting the loads generated by a helicopter ~~conducting an emergency touchdown on it~~in motion.

'Elevated helicopter clearway' means a helicopter clearway that has been raised to a level that provides obstacle clearance.

'Elongated', when used with TLOF or FATO, means an area which has a length more than twice its width.

[…]

~~'Helicopter air taxiway' means a defined path on the surface established for the air taxiing of helicopters.~~

'Helicopter clearway' means a defined area ~~on the ground or water, selected and/or prepared as a suitable area~~ over which a helicopter ~~operated in performance class 1~~ may accelerate and achieve a ~~specific height~~specified set of helicopter flight conditions.

[…]

'Helicopter ~~ground~~ taxiway' means a ~~ground taxiway intended for the ground movement of wheeled undercarriage helicopters~~defined path on a heliport intended for the ground movement of helicopters and that may be combined with an air taxi-route to permit both ground and air taxiing.

'Helicopter taxi-route' means a defined path established for the movement of helicopters from one part of a heliport to another. ~~A taxi-route includes a helicopter air or ground taxiway which is centred on the taxi-route.~~

— ‘Air taxi-route’ means a marked taxi-route intended for air taxiing.

— ‘Ground taxi-route’ means a taxi-route centred on a taxiway.

[…]

‘Initial departure fix (IDF)’ means the terminal fix for the visual segment and the fix where the instrument phase of the PinS departure begins.

‘Point-in-space (PinS) approach’ means an approach procedure designed for helicopters only that includes both a visual and an instrument segment.

‘Point-in-space (PinS) departure’ means a departure procedure designed for helicopters only that includes both a visual and an instrument segment.

‘Point-in-space (PinS) reference point (PRP)’ means a reference point for the point-in-space approach as identified by the latitude and longitude of the MAPt.

‘Point-in-space (PinS) visual segment’ means the segment of a helicopter PinS procedure between a point (MAPt or IDF) and the heliport.

‘Protection area’ means ~~an area within a taxi-route and around a helicopter stand which provides separation from objects, the FATO, other taxi-routes and helicopter stands, for safe manoeuvring of helicopters~~a defined area surrounding a stand intended to reduce the risk of damage from helicopters accidentally diverging from the stand.

[…]

‘Touchdown/positioning circle (TDPC)’ means a touchdown positioning marking (TDPM) in the form of a circle used for omnidirectional positioning in a TLOF.

‘Touchdown/positioning marking (TDPM)’ means a marking or set of markings providing visual cues for the positioning of helicopters.

‘Vertical procedures’ means take-off and landing procedures that include an initial vertical or steep climb and a final vertical or steep descent profile. The profile may or may not include a lateral component.

[…]

Rationale

The addition, amendment or deletion of definitions are proposed to maintain coherence with the ICAO definitions that stem from amendments 9 and 10 of Annex 14, Vol. II.

The main additions are related to the potential existence of vertical procedures and of PinS procedures and provide the definitions of the terms that appear in the related requirements in the following Chapters.

Furthermore, the term ‘elongated’ is proposed to be introduced, to allow for the relaxation of the stringent slope requirements that are currently included in the CS for FATOs and TLOFs.

The helicopter stand is proposed to be redefined in line with amendment 9 of Annex 14, Vol. II. According to ICAO, the definition was amended to include the aspect of usage, since the term ‘apron’ – that contains the aspect of usage in Annex 14, Vol. I – is not included in Vol. II.

Moreover, 'Design D' is an attribute of the 'design helicopter' (see also GM1 HPT-DSN.A.020) in a set of measurements used in the heliport design process. The note under the definition of 'D' is proposed to be deleted due to the addition of a separate definition of 'D-value'.

The proposed inclusion of the terms 'touchdown/positioning circle (TDPC)' and 'touchdown/positioning marking (TDPM)' clarifies the objective and nature of the corresponding markings and highlights their difference.

The definitions of taxiway, taxi-route, air taxi-route and ground taxi-route are proposed to be amended in line with the change of usage. The simplification of the concept has allowed the removal of the term 'helicopter air taxiway'. The taxiway is combined with a ground taxi-route to provide protection to the whole helicopter while ground taxiing; it may also be combined with an air taxi-route to permit both ground and air taxiing. Consequently, the definition of 'protection area' is proposed to be amended, so as not to contain reference to taxi-routes. This is done with a rewording of the rest of the definition, using the same terms as the 'safety area', which serves similar purpose.

GM1 HPT-DSN.A.020 Definitions

(a) Further information on operations of performance classes 1, 2 and 3 helicopters are given in Commission Regulation (EU) No 965/2012 on air operations and in ICAO Annex 6, Operations of Aircraft, Part III, Helicopters.

(b) The design helicopter represents the largest dimensions, the greatest maximum take-off mass (MTOM) and the most critical obstacle avoidance criteria of the population of helicopters the heliport is intended to serve. For guidance on establishing a design helicopter see the Heliport Manual (Doc 9261).

(c) All runway-type FATOs are elongated, but not all elongated FATOs are runway-type FATOs.

(d) The design criteria for PinS procedures are established in the Procedures for Air Navigation Services — Aircraft Operations, Volume II (PANS-OPS, Doc 8168 – Volume II).

Rationale

The proposed addition of the 'Design D' definition introduces the term 'design helicopter'. Since there is no definition for this term, a description of what a 'design helicopter' is, is proposed to be added to as point (b) of this GM, based on Note 2 of Chapter 1 of Annex 14, Vol. I, as amended by amendment 10. A reference to the Heliport Manual was also added, where more information can be found.

Proposed point (c) is based on the rationale of the state letter (SL 18/97) with which the term 'elongated' was introduced. It clarifies the relation between the terms 'elongated' and 'runway-type' FATO.

Furthermore, a reference to PANS-OPS Volume II was added as point (d), in relation to the proposed addition of provisions for heliports utilising PinS procedures.

CHAPTER B — FINAL APPROACH & TAKE-OFF AND TOUCH-DOWN & LIFT-OFF AREAS~~HELICOPTER OPERATING AREAS~~

Rationale

The term 'operating area' is not defined in the ICAO Annex 14 Vol. II or the Heliport Manual. In the former, it is contained twice in relation to shipboard heliports only. In the latter, it is contained 15 times, but only twice in relation to onshore heliports and more precisely regarding RFFS provisions for elevated heliports. Furthermore, it could be argued that this term also includes the taxiways, the taxi routes, and the parking stands, which are covered in Chapters C and D.

Therefore, a new title is proposed that covers the most important of the areas that are included in Chapter B. The fact that the rest of the areas included in the present Chapter are not mentioned in the title should not be seen as a problem, since these areas are directly associated with the ones mentioned. This arrangement has its equivalent in Chapter B of the CS-ADR-DSN: The title contains only the term 'runways', but the Chapter includes provisions for the runway shoulders, runway strips and runway turn pads.

CS HPT-DSN.B.100 Final approach and take-off areas (FATOs)

[…]

(b) Location: ~~A FATO in proximity to other infrastructure and objects should be located so as to minimise:~~

~~(1) the influence of the surrounding environment, including structure-induced turbulence;~~

~~(2) the influence of, and on, the surrounding traffic, including wake turbulence, where simultaneous aircraft operations are intended.~~

(1) A FATO in proximity to other infrastructure and objects should be located so as to minimise:

(i) the influence of the surrounding environment, including structure-induced turbulence;

(ii) the influence of, and on, the surrounding traffic, including wake turbulence, where simultaneous aircraft operations are intended.

(2) Where a FATO is located near a runway or taxiway, and when simultaneous helicopter and aeroplane operations are planned, the separation distance between the edge of a runway or taxiway and the edge of a FATO should not be less than the appropriate dimension in Table B-1.

(3) A FATO should not be located:

(i) near taxiway intersections or holding points where jet engine efflux is likely to cause high turbulence; or

(ii) near areas where aeroplane vortex wake generation is likely to exist.

If aeroplane mass and/or helicopter mass are	Distance between FATO edge and runway edge or taxiway edge
up to but not including 3 175 kg	60 m
3 175 kg up to but not including 5 760 kg	120 m
5 760 kg up to but not including 100 000 kg	180 m
100 000 kg and over	250 m
Note: The values specified in this table are primarily intended to mitigate risks of wake turbulence encounters. In addition to this table, when positioning a FATO intended to be used simultaneously with a nearby runway or taxiway, attention should be given to other CS ADR-DSN requirements such as the minimum runway strip width. Local environment should be taken into account when setting the separation between the FATO and nearby infrastructure elements to ensure the safety of simultaneous operations.	

Table B-1. FATO edge to runway/taxiway edge minimum separation distance for simultaneous operations

(c) Characteristics:

(1) ~~A FATO should be obstacle-free; however, when collocated with the touchdown and lift-off area (TLOF), TLOF arrays of segmented point source lighting (ASPSL) or luminescent panels (LPs) with a height not more than 5 cm can be provided for the installation of visual aids.~~A FATO should provide an area:

(i) free of obstacles, except for frangible essential objects which should not penetrate a horizontal plane at the FATO elevation by more than 5 cm and because of their function are located on it; and

(ii) of sufficient size and shape to ensure containment of every part of the design helicopter in the final phase of approach and commencement of take-off in accordance with the intended procedures.

(2) Where a FATO is intended to be used by helicopters operated in performance class 1, its minimum dimensions should be equal to:~~as prescribed in the helicopter (aircraft) flight manual (HFM) except that, in the absence of width specifications, the width should be not less than the greatest overall dimension (D) of the largest helicopter the FATO is intended to serve.~~

(i) the length of the rejected take-off distance (RTOD) for the required take-off procedure prescribed in the helicopter flight manual (HFM) of the helicopters for which the FATO is intended, or 1.5 Design D, whichever is greater; and

(ii) the width for the required procedure prescribed in the HFM of the helicopters for which the FATO is intended, or 1.5 Design D, whichever is greater.

(3) Where a FATO is intended to be used by helicopters operated in performance class 2 or 3, its minimum dimensions should be the lesser of:~~of sufficient size and shape to contain an area within which a circle can be drawn of diameter not less than:~~

~~(i) 1 D of the largest helicopter when the maximum take-off mass (MTOM) of helicopters the FATO is intended to serve is more than 3 175 kg;~~

~~(ii) 0.83 D of the largest helicopter when the MTOM of helicopters the FATO is intended to serve is 3 175 kg or less.~~

(i) an area within which can be drawn a circle of diameter of 1.5 Design D; or

(ii) when there is a limitation on the direction of approach and touchdown, an area of sufficient width to meet the requirement of (c)(1) but not less than 1.5 times the overall width of the design helicopter.

(4) ~~The surface of the FATO should:~~

~~(i) be resistant to the effects of rotor downwash;~~

~~(ii) be free of irregularities that would adversely affect the take-off or landing of helicopters;~~

~~(iii) have bearing strength sufficient to accommodate a rejected take-off by helicopters operated in performance class 1;~~

~~(iv) provide ground effect;~~

~~(v) have a mean slope in any direction which should not exceed 3 per cent; and~~

~~(vi) provide rapid drainage.~~

The surface of the FATO should be resistant to the effects of rotor downwash, provide ground effect, and:

(i) when collocated with a TLOF, is contiguous and flush with the TLOF, has bearing strength capable of withstanding the intended loads and ensures effective drainage; or

(ii) when not collocated with a TLOF, is free of hazards should a forced landing be required.

(5) The slope of the FATO should not exceed 2 per cent in any direction, except as provided in (i) and (ii) below~~No slope exceeding~~:

(i) ~~5 per cent where the heliport is intended to be used by helicopters operated in performance class 1;~~When the FATO is elongated and intended to be used by helicopters operated in performance class 1, the slope should not exceed 3 per cent overall or 5 per cent locally.

(ii) ~~7 per cent where the heliport is intended to be used by helicopters operated in performance class 2 or 3.~~When the FATO is elongated and intended to be used solely by helicopters operated in performance class 2 or 3, the slope should not exceed 3 per cent overall or 7 per cent locally.

(6) A FATO should be surrounded by a safety area.

Rationale

It is proposed to transfer the guidance material related to the location of a FATO to the certification specifications. The objective is to achieve better coherence between the EASA and the ICAO regulatory framework, considering that these two provisions are at the level of a Standard and a Recommended Practice in Annex 14 Vol. II.

The rest of the proposed amendments of this provision are stemming from amendment 9 of Annex 14 Vol.II. In particular:

The text of (c)(1) is proposed to be substituted by two sets of provisions. The first is related to the requirement of the area to be free of obstacles except from frangible essential objects. This wording is a generalisation of the old one, which referred only to visual aids and only when the FATO would be collocated with a TLOF. The requirement for these to have a maximum height of 5 cm remains in the new provision. The second provision is the requirement of the FATO to be of sufficient shape and size to ensure containment of the helicopters. With the proposed wording the essence of the current text is not changed, but at the same time the objective of the FATO becomes clearer.

The text of (c)(2) – for helicopters operated in performance class 1 – is also proposed to be substituted by two sets of provisions. In relation to the length of the FATO, the proposed text still refers to the HFM but also contains a minimum length of 1.5 Design D. In relation to the width, the proposed provision contains a different minimum width of 1.5 Design D, instead of 1 D of the current provision.

Similarly, for helicopters operated in performance class 2 or 3, the minimum dimensions (length, width) of the FATO included in (c)(3) are proposed to be increased to 1.5 Design D, when manoeuvring is not restricted. If this is not the case, a narrower FATO might be possible. With this amendment the safety of operations during take-off and final approach is increased and additionally alignment with Annex 14 Vol. II is maintained.

Current provision (c)(4) regarding the surface of the FATO is proposed to be reworded. The requirements for resistance to the rotor downwash, ground effect, drainage and bearing strength remain in this provision. Regarding the last two requirements:

- *a distinction is proposed to be made for the cases of a FATO collocated or not collocated with a TLOF and*
- *the applicability to only helicopters operated in PC1 for the bearing strength to be removed.*

The current requirement for the FATO to be free of irregularities is covered by the proposed (c)(1) and the proposed CS HPT-DSN.B.120(b)(1)(ii)(B). The requirement for the mean slope is proposed to be transferred to (c)(5), since this already contains further requirements regarding the slopes.

Finally, the amended slope requirements of Annex 14 Vol. II are proposed to be included. The reduction of the proposed maximum allowable mean slope from 3 % to 2 % is based on the fact that ICAO merged the requirements of the elevated and the surface level heliports, partially due to lack of historical data that would support the 3 % slope requirement. In contrast, for elongated FATOs, ICAO maintained the 3% maximum allowable mean slope considering that elongated FATOs are more challenging for the designer.

GM1 HPT-DSN.B.100 Final approach and take-off areas (FATOs)

(a) General:

(1) A FATO may not be necessary to be provided at an~~d~~ aerodrome, where the runway is used for the purposes of final approach and take-off of helicopters.

(2) ~~Where a FATO is located near a runway or taxiway, and when simultaneous helicopter and aeroplane operations are planned, the separation distance between the edge of a runway or taxiway and the edge of a FATO should not be less than the appropriate~~

~~dimension in Table GM1-B-1.~~The design provisions given in CS HPT-DSN.B.100 assume that:

(i) when conducting operations to or from a FATO, no more than one helicopter will be in the FATO at the same time; and

(ii) when conducting operations to or from a FATO in proximity to another FATO, these operations will not be simultaneous. If simultaneous helicopter operations are required, appropriate separation distances between FATOs need to be determined, giving due regard to such issues as rotor downwash and airspace, and ensuring the flight paths for each FATO do not overlap.

(3) Operational limitations should be considered under certain wind conditions.

(4) Local conditions, such as elevation, temperature and permitted manoeuvring may need to be considered when determining the size of a FATO.

(5) Due consideration should be given to the effects of rotor downwash and other aspects of helicopter operations on third parties regarding the siting of a heliport and the location of the various defined areas. It must be pointed out that when helicopters are close to the ground, downwash is inherently connected to an outward flow of air ('outwash'). Therefore, in the context of the CS-HPT-DSN the term 'downwash' should be understood as including also the 'outwash'.

(6) The need for risk mitigation measures should be examined in the case of a runway-type FATO at an aerodrome having a runway with the same designation marking.

(7) An important factor affecting the selection of the siting and orientation of the FATO at a heliport is the interference of arrival and departure tracks with areas approved for residential use and other noise-sensitive areas close to the heliport.

(8) The RTOD is intended to ensure containment of the helicopter during a rejected take-off. Although some HFMs provide the RTOD, in others the dimension provided is the 'minimum demonstrated … size' (where '…' could be 'heliport', 'runway', 'helideck', etc.) and this may not include helicopter containment. When this is the case, it is necessary to consider sufficient safety area dimensions as well as the dimensions of 1.5·D for the FATO, should the HFM not deliver data.

(9) Further guidance is given in the Heliport Manual (Doc 9261).

~~If aeroplane mass and/or helicopter mass are~~	~~Distance between FATO edge and runway edge or taxiway edge~~
~~up to but not including 3 175 kg~~	~~60 m~~
~~3 175 kg up to but not including 5 760 kg~~	~~120 m~~
~~5 760 kg up to but not including 100 000 kg~~	~~180 m~~
~~100 000 kg and over~~	~~250 m~~
~~Note: The values specified in this table are primarily intended to mitigate risks of wake turbulence encounters. In addition to this table, when positioning a FATO intended to be used simultaneously with a nearby runway or taxiway, attention should be given to other CS ADR-DSN requirements such as the minimum runway strip width. Local environment should be taken into account when setting the separation between the FATO and nearby infrastructure elements to ensure the safety of simultaneous operations.~~	

~~***Table GM1-B-1. FATO minimum separation distance***~~

~~(b) A FATO should not be located:~~

~~(i) near taxiway intersections or holding points where jet engine efflux is likely to cause high turbulence; or~~

~~(ii) near areas where aeroplane vortex wake generation is likely to occur.~~

Rationale

It is proposed to add new Guidance Material based on the Notes of Annex 14 Vol. II. These are related to factors that have to be taken into account in the process of selecting a suitable siting of the FATO or a heliport as a whole. In comparison to the Notes of Annex 14 Vol. II, an addition is also proposed regarding point (a)(5) and the term 'downwash'; namely that it should be regarded in combination with the 'outwash', i.e. the outward flow of air when the helicopter is close to the ground. This is an important element that has to be considered, due to the high mean and peak velocity of the air flow that has led to injuries in the past. (See also EPAS Vol. III, ed. 2025, SI-8041 'Downwash adverse effects'.)

A further GM – not included in the Annex 14 Vol. II – is proposed in relation to the need of a safety assessment in case of the existence of a runway-type FATO and a runway with the same designation markings at an aerodrome.

For the proposed deletion of the GM regarding the location of a FATO, see the rational of the CS.

GM2 HPT-DSN.B.100 Final approach and take-off areas (FATOs)

(a) 'Essential objects' are visual aids (e.g. lighting) or others (e.g. firefighting systems) necessary for safety purposes.

(b) 'Resistant' implies that effects from rotor downwash neither cause a degradation of the surface nor result in flying debris.

Rationale

It is proposed to add new Guidance Material that are related to terms that appear in the proposed CS ('essential objects' and 'resistant') and provide more insight in their context.

CS HPT-DSN.B.110 Helicopter clearways

(a) Applicability: ~~When provided, a helicopter clearway should be located beyond the end of the FATO.~~The inclusion of detailed specifications for helicopter clearways in this section is not intended to imply that a clearway has to be provided.

(b) Characteristics:

(1) The width of a helicopter clearway should not be less than that of the FATO and associated safety area (see Figure B-1).

(2) A helicopter clearway should provide:

(i) an area free of obstacles, except for frangible essential objects which because of their function are located on it, and of sufficient size and shape to ensure containment of the design helicopter when it is accelerating to achieve its safe climbing speed;

(ii) when solid, a surface which is contiguous and flush with the FATO and safety area, resistant to the effects of rotor downwash and free of hazards, if a forced landing is required; or

(iii) when elevated, clearance above all obstacles.

(3) When a helicopter clearway is provided, the inner edge should be located:

(i) at the outer edge of the safety area; or

(ii) when elevated, directly above the outer edge of the safety area.

~~(2)~~(4) When the helicopter clearway is solid, ~~T~~the ground ~~in a helicopter clearway~~ should not project above a surface~~plane~~ having an overall upward slope of 3 per cent or having a local upward slope exceeding 5 per cent, ~~commencing at~~the lower limit of this surface being a horizontal line which is located on the periphery of the FATO.

~~(3)~~(5) An object situated in a helicopter clearway, which may endanger helicopters in the air, should be regarded as an obstacle and should be removed.

Rationale

The CS is proposed to be amended mainly with the introduction of the new provisions stemming from both amendments 9 and 10 of Annex 14 Vol. II, in relation to the characteristics of the helicopter clearways. In particular:

The current applicability provision contains a location requirement and is proposed to be substituted with the statement that a clearway need not be provided. However, the current provision is not proposed to be transferred in paragraph (b); see rationale for point (b)(3) below.

The terms 'FATO and' are proposed to be included in the current point (b)(1), to clarify the necessary width.

Proposed point (b)(2) combines amendments 9 and 10 of Annex 14 Vol. II and provides the required characteristics related to the area of the clearway, the clearway surface itself and the possibility to define an elevated clearway, as introduced in amendment 10 of Annex 14 Vol. II.

Furthermore, the proposed point (b)(3) stems from amendment 10 of Annex 14 Vol. II and describes more accurately the relative position of the helicopter clearway and the safety area, including the case of the elevated helicopter clearway. The requirement that a helicopter clearway 'should be located beyond the end of the FATO' is therefore no longer in line with Annex 14 Vol. II, and it is proposed to be deleted.

Moreover, the proposed amendment of current provision (b)(2) (new point (b)(5)) – stemming from amendment 9 pf Annex 14 Vol. II – provides consistency with the slopes of the FATO. A conditional statement that this requirement is valid only when the helicopter clearway is solid, was also added for clarity.

GM1 HPT-DSN.B.110 Helicopter clearways

~~General: A helicopter clearway would need to be considered when the heliport is intended to be used by helicopters operating in performance class 1.~~

Intentionally left blank

Rationale

The GM is proposed to be deleted in line with the deletion of the corresponding Note in Annex 14 Vol. II with amendment 9, because according to ICAO it has led to misunderstanding by suggesting that helicopter clearways are required for PC1 operations. See also the rationale for the amendment of the CS.

CS HPT-DSN.B.120 Touchdown and lift-off areas (TLOFs)

(a) General:

~~(1) At least one TLOF should be provided at a heliport.~~

~~(2) One TLOF should be located within the FATO or one or more TLOFs should be collocated with helicopter stands.~~

(1) A heliport should be provided with at least one TLOF.

(2) A TLOF should be provided whenever it is intended that the undercarriage of the helicopter will touch down within a FATO or stand, or lift off from a FATO or stand.

(b) Characteristics:

~~(1) A TLOF should be of sufficient size to contain a circle of diameter of at least 0.83 D of the largest helicopter the area is intended to serve.~~

~~(2) Where the TLOF is within the FATO, the TLOF should be dynamic load-bearing.~~

~~(3) Where a TLOF is collocated with a helicopter stand, the TLOF should be static load-bearing and be capable of withstanding the traffic of the helicopters that the area is intended to serve.~~

~~(4) Slopes on a TLOF should be sufficient to prevent accumulation of water on the surface of the area and should not exceed 2 per cent in any direction.~~

~~(5) Where a TLOF is located within a FATO which can contain a circle of diameter more than 1 D, the centre of the TLOF should be located not less than 0.5 D from the edge of the FATO.~~

(1) A TLOF should be associated with a FATO or a stand and should provide:

(i) an area free of obstacles and of sufficient size and shape to ensure containment of the undercarriage of the most demanding helicopter the TLOF is intended to serve in accordance with the intended orientation;

(ii) a surface which:

(A) has sufficient bearing strength to accommodate the dynamic loads associated with the anticipated type of arrival of the helicopter at the designated TLOF;

(B) is free of irregularities that would adversely affect the touchdown or lift-off of helicopters;

(C) has sufficient friction to avoid skidding of helicopters or slipping of persons;

(D) is resistant to the effects of rotor downwash; and

(E) ensures effective drainage while having no adverse effect on the control or stability of a helicopter during touchdown and lift-off, or when stationary.

(2) The minimum dimensions of a TLOF should be:

(i) when in a FATO intended to be used by helicopters operated in performance class 1, the dimensions for the required procedure prescribed in the helicopter flight manuals (HFMs) of the helicopters for which the TLOF is intended; and

(ii) when in a FATO intended to be used by helicopters operated in performance classes 2 or 3, or in a stand:

(A) when there is no limitation on the direction of touchdown, of sufficient size to contain a circle of diameter of at least 0.83 D of:

(a) in a FATO, the design helicopter; or

(b) in a stand, the largest helicopter the stand is intended to serve;

(B) when there is a limitation on the direction of touchdown, of sufficient width to meet the requirement of (b)(1)(i) above but not less than twice the undercarriage width (UCW) of:

(a) in a FATO, the design helicopter; or

(b) in a stand, the most demanding helicopter the stand is intended to serve.

(3) Slopes on a TLOF should not exceed 2 per cent in any direction except as provided in (i) or (ii) below:

(i) when the TLOF is elongated and intended to be used by helicopters operated in performance class 1; exceed 3 per cent overall, or have a local slope exceeding 5 per cent; and

(ii) when the TLOF is elongated and intended to be used solely by helicopters operated in performance class 2 or 3, exceed 3 per cent overall, or have a local slope exceeding 7 per cent.

(4) When a TLOF is within a FATO it should be:

(i) centred on the FATO; or

(ii) for an elongated FATO, centred on the longitudinal axis of the FATO.

(5) When a TLOF is within a helicopter stand, it should be centred on the stand.

(6) A TLOF should be provided with markings which clearly indicate the touchdown position and, by their form, any limitations on manoeuvring.

Rationale

Point (a) is proposed to be reworded for more clarity in line with Annex 14 Vol. II and considering amendment 9 thereof.

Furthermore, the new provisions of Annex 14 Vol. II – stemming from amendment 9 – are proposed to replace the current requirements in point (b). With the new proposed provisions, the attributes of the TLOF are provided and the characteristics of the TLOF are better described in respect to its size, load bearing, slopes and relative position in a FATO or a helicopter stand. In particular:

Regarding the size of the TLOF, the dimensions of a PC 1 TLOF, are based on the dimensions provided in the HFM of the helicopter for which the TLOF is intended, while for PC2/3 TLOF the size remains at 0.83 D of the design helicopter. For the latter case, however, it is possible to reduce the width of the TLOF to 2 UCW, if the TLOF or stand caters only for unidirectional positioning. In general, therefore, the new proposed form of provisions offers both increased operational safety and flexibility to the heliport designer, where this is possible.

The bearing strength is proposed to be suitable to accommodate dynamics loads both in the case of a FATO collocated with a FATO and a stand, instead of the lower static load bearing that is now required for the stands.

The proposed slopes in point (b)(3) ensure effective drainage and are in line with the proposed new FATO slopes (see rationale for CS HPT-DSN.B.100).

The proposed provisions in points (b)(4) to (b)(6) regarding the relative position of the TLOF in a FATO or a helicopter stand and the existence of the TDPM are related to ensuring the containment of the helicopter. It should be mentioned that with the new provisions the position of the TLOF is always centred on the FATO or the longitudinal axis of the FATO, to ensure containment.

GM1 HPT-DSN.B.120 Touchdown and lift-off areas (TLOFs)

~~Additional TLOFs may be located within runway-type FATOs.~~See CS HPT-DSN.F.570 and GM HPT-DSN.F.570 regarding the markings that that should be used for the indication of the touchdown position and any manoeuvring limitations.

Rationale

The provision of the current GM is proposed to be deleted, since it is incompatible with the proposed (b)(4) and (b)(5) of the CS HPT-DSN.B.120 (see the corresponding rationale).

In relation to point (b)(6) of the CS, a reference to the provisions regarding the touchdown/positioning markings is proposed to be added.

CS HPT-DSN.B.130 Safety areas

(a) General: A FATO should be surrounded by a safety area which need not be solid.

(b) Characteristics:

(1) A safety area surrounding a FATO should ~~extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.25 D, whichever is greater, of the largest helicopter the FATO is intended to serve and~~:

~~(i) each external side of the safety area should be at least 2 D where the FATO is quadrilateral (see Figure B-1); or~~

~~(ii) the outer diameter of the safety area should be at least 2 D where the FATO is circular.~~

(i) extend outwards from the periphery of the FATO for a distance of at least 3 m or 0.25 Design D, whichever is greater (see Figure B-1); and

(ii) include the additional areas lying between the area defined in point (i) above, and the inner edge of the take-off climb/approach surfaces or the clearway(s), if the latter are provided, where:

(A) the FATO is not rectangular; or

(B) the FATO is rectangular, and the axes of the take-off climb/approach surfaces or the clearway(s) are oblique to the sides of the FATO.

(2) ~~The surface of the safety area should be treated to prevent flying debris caused by rotor downwash.~~A safety area should provide an area free of obstacles, except for frangible essential objects which because of their function are located on it, to compensate for manoeuvring errors. Frangible essential objects located in the safety area should not penetrate a surface originating at the edge of the FATO at a height of 25 cm above the plane of the FATO sloping upwards and outwards at a gradient of 5 per cent.

(3) When solid, the surface of the safety area ~~abutting the FATO~~ should ~~be continuous with the FATO.~~:

(i) where it abuts the FATO, be contiguous and flush with the FATO;

(ii) be resistant to the effects of rotor downwash;

(iii) ensure effective drainage; and

(iv) not project above a plane having an upward slope of 4 per cent, commencing at the edge of the FATO.

~~(4) When solid, the surface of a safety area should not project above a plane having an upward slope of 4 per cent, commencing at the periphery of the FATO.~~

~~(5) From the outer edge of the safety area to a distance of 10 m there should be a protected side slope rising at 45 degrees.~~

~~(6) The protected side slope should not be penetrated by obstacles, except that when obstacles are located to one side of the FATO only, they may be permitted to penetrate the side slope surface.~~

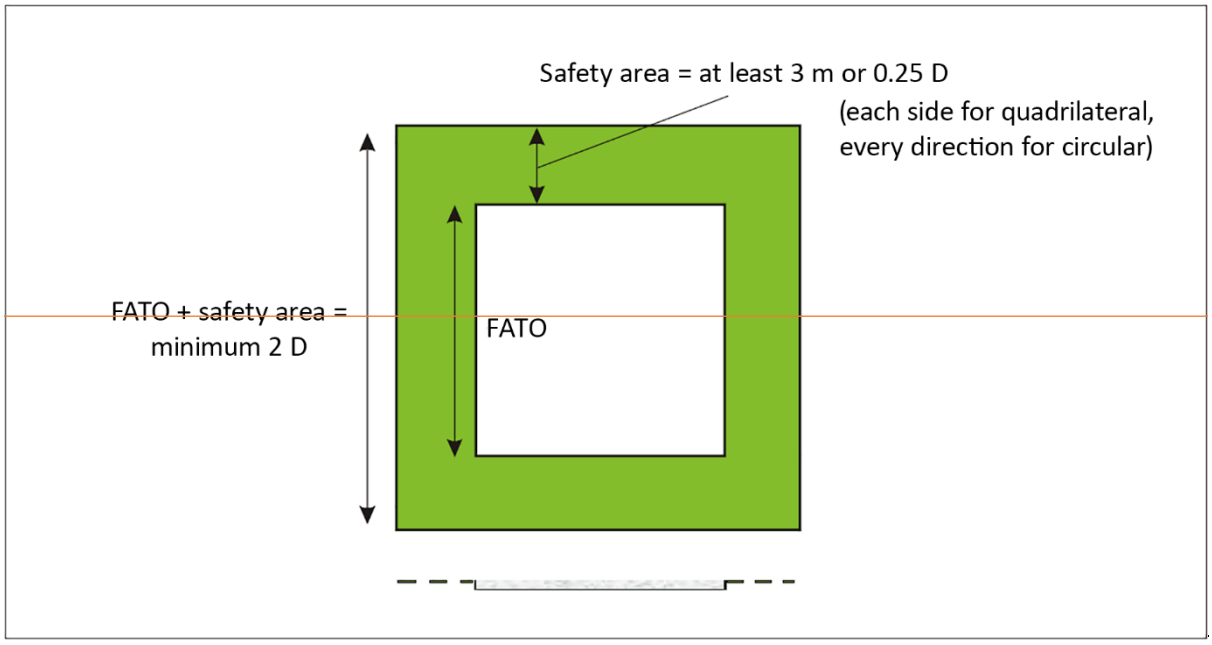
~~(7) No mobile object should be permitted on a safety area during helicopter operations.~~

~~(8) No fixed object should be permitted above the plane of the FATO on a safety area, except for frangible objects which, because of their function, must be located on the area.~~

~~(9) Objects whose function requires them to be located on the safety area should not:~~

~~(i) if located at a distance of less than 0.75 D from the centre of the FATO, penetrate a plane at a height of 5 cm above the plane of the FATO; and~~

~~(ii) if located at a distance of 0.75 D or more from the centre of the FATO, penetrate a plane originating at a height of 25 cm above the plane of the FATO and sloping upwards and outwards at a gradient of 5 per cent.~~



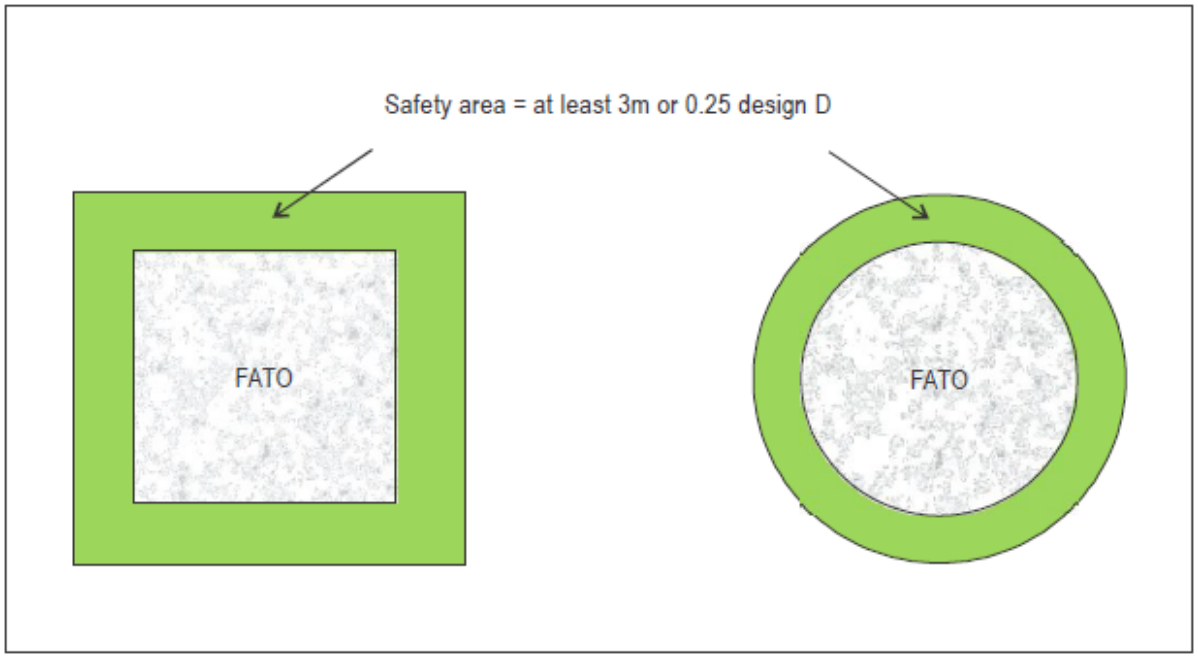


Figure B-1. FATO and associated safety area

Rationale

The proposed amendments – apart from point (b)(1)(ii) – stem from amendment 9 of Annex 14 Vol. II.

Regarding the size of the safety area, proposed point (b)(1)(i) simplifies the current provision (b)(1) without changing its essence. The removal of the overall size requirement provides flexibility to the heliport designers in cases where the FATO is decreased while still ensuring containment. Use of the new term 'Design D' is also made.

In addition, both Figure 3-2 of Annex 14 Vol. II (which is proposed to be modified and added to the CS-HPT-DSN as Figure B-2) and Figure E-1 of the CS-HPT-DSN contain remarks regarding the need for the area lying between the safety area and the take-off climb/approach surfaces to have the same characteristics with the safety area regarding obstacle control. However, no provision has been included to this effect. Point (b)(1)(ii) is, therefore, proposed to be introduced, based on which the additional area, that is described above, is considered part of the safety area. This is in line with the requirement of the protected side slope (see CS HPT-DSN.B.140) to 'rise … outwards from the safety area' and of the lower edge of the transitional surface to lie 'along the length of the side of the helicopter clearway, when provided, and safety area, parallel to the centre line of the FATO' (see CS HPT-DSN.E.425). If this additional area is not considered to be part of the 'safety area', then the descriptions of the protected side slope and of the transitional surface are problematic, in the cases of a non-rectangular FATO and of a rectangular FATO, where the axes of the take-off climb/approach surfaces or the clearway(s), where they are provided, are oblique to the sides of the FATO. It should be mentioned, that with the proposed wording the additional portions of the safety area should satisfy not only obstacle-related requirements, but also slope, drainage and resistance to the effects of the downwash requirements. EASA considers that these should indeed be satisfied.

The current provision (b)(2) is proposed to be reworded and together with provision (b)(4) to be combined with (b)(3), since all three provisions are related to the surface of the safety area. A new

requirement regarding the drainage characteristics of the protection area is also proposed to be added to (b)(3).

Furthermore, provisions (b)(5) and (b)(6) are related to the protected side slope, which is proposed to be dealt with separately (new HPT-DSN.B.140).

Moreover, current point (b)(7) is related to an operational requirement and is proposed to be transferred to ADR.OPS.B.027.

The current provisions (b)(8) and (b)(9) are related to the fixed objects on the safety area are proposed to be deleted and a single new provision (b)(2) to be added, which has the same safety objectives, especially when read in combination with CS HPT-DSN.B.100(c)(1)(i).

Finally, Figure B-1 is proposed to be substituted with the corresponding Figure in the Annex 14 Vol. II, illustrating both cases of a square and of a circular FATO and safety area. In the new Figure, the text related to the overall minimum dimensions of the FATO and safety area has been deleted in line with the proposed deletion of the related provision (see above).

GM1 HPT-DSN.B.130 Safety areas

~~When only a single approach and take-off climb surface is provided, the need for specific protected side slopes should be determined by a safety assessment.~~

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Rationale

The text of the GM is proposed to be transferred to the new proposed GM1 HPT-DSN.B.140, since it refers to the protected side slopes.

CS HPT-DSN.B.140 Protected side slope

(a) General: A heliport should be provided with at least two protected side slopes.

(b) Characteristics: The surface of a protected side slope should:

(i) rise at 45 degrees outward from the edge of the safety area and extend to a distance of 10 m (see Figure B-2); and

(ii) not be penetrated by obstacles.

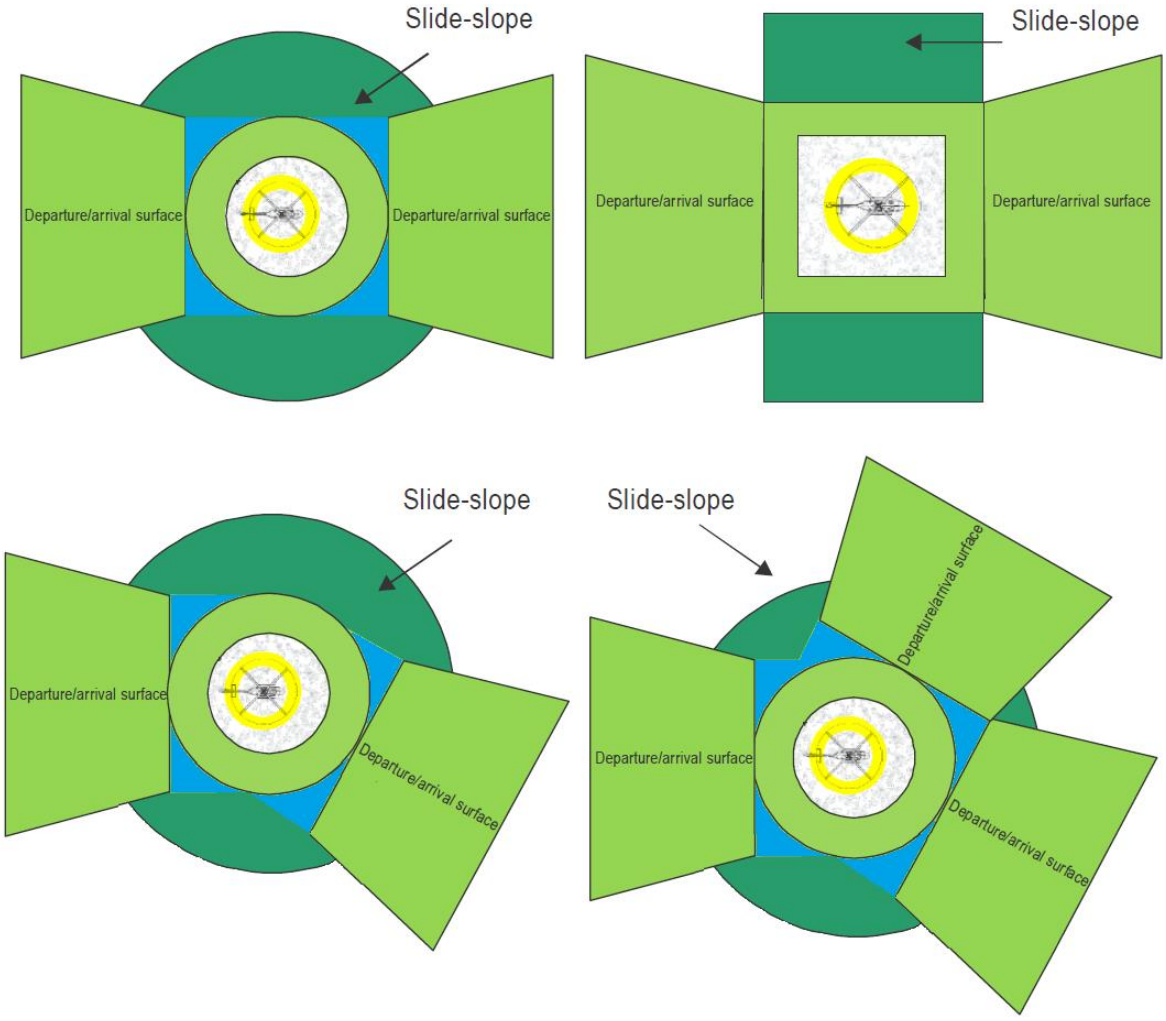

Figure B-2. FATO simple/complex safety area and side slope protection.

Note: The light green areas surrounding the FATO and in the trapezoids indicate the safety areas and the take-off/approach surfaces respectively, the dark green areas indicate the side-slopes, and the blue areas indicate the additional part of the safety areas between a non-rectangular FATO and the take-off climb/approach surfaces.

Rationale

A separate paragraph concerning the protected side slope is proposed to be created, in line with the structure of Annex 14 Vol. II and to increase the visibility of the provisions.

The proposed requirement is to have at least two protected side slopes in line with the new Recommendation introduced by amendment 9, Annex 14 Vol. II.

GM1 HPT-DSN.B.140 Protected side slope

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CHAPTER C — HELICOPTER TAXIWAYS AND TAXI-ROUTES

CS HPT-DSN.C.200 Helicopter ~~ground~~ taxiways ~~and helicopter ground taxi-routes~~

(a) General: A helicopter ~~ground~~ taxiway should be designed to permit the surface movement of a wheeled helicopter under its own power.

(b) Characteristics:

~~(1) The width of a helicopter ground taxiway should not be less than 1.5 times the largest width of the undercarriage (UCW) of the helicopters the helicopter ground taxiway is intended to serve (see Figure C-1).~~

~~(2) The longitudinal slope of a helicopter ground taxiway should not exceed 3 per cent.~~

~~(3) A helicopter ground taxiway should be static load-bearing and capable of withstanding the traffic of the helicopters the helicopter ground taxiway is intended to serve.~~

~~(4) A helicopter ground taxiway should be centred on a helicopter ground taxi-route.~~

~~(5) A helicopter ground taxi-route should extend symmetrically on each side of the centre line for at least 0.75 times the largest overall width of the helicopters it is intended to serve.~~

~~(6) No fixed object should be permitted above the surface on a helicopter ground taxi-route, except for frangible objects, which, because of their function, must be located there.~~

~~(7) No mobile object should be permitted on a ground taxi-route during helicopter movements.~~

~~(8) Objects whose function requires them to be located on a helicopter ground taxi-route should not:~~

~~(i) be located at a distance of less than 50 cm from the edge of the helicopter ground taxiway; and~~

~~(ii) penetrate a plane originating at a height of 25 cm above the plane of the helicopter ground taxiway, at a distance of 50 cm from the edge of the helicopter ground taxiway and sloping upwards and outwards at a gradient of 5 per cent.~~

~~(9) The helicopter ground taxiway and the helicopter ground taxi-route should provide rapid drainage but the transverse slope of a helicopter ground taxiway should not exceed 2 per cent.~~

~~(10) The surface of a helicopter ground taxi-route should be resistant to the effect of rotor downwash.~~

~~(11) For simultaneous operations, the helicopter ground taxi-routes should not overlap.~~

(1) A helicopter taxiway should be associated with a taxi-route and should provide:

(i) an area free of obstacles and of sufficient width to ensure containment of the undercarriage of the most demanding wheeled helicopter the taxiway is intended to serve;

(ii) a surface which:

(A) has bearing strength to accommodate the taxiing loads of the helicopters the taxiway is intended to serve;

(B) is free of irregularities that would adversely affect the ground taxiing of helicopters;

(C) is resistant to the effects of rotor downwash; and

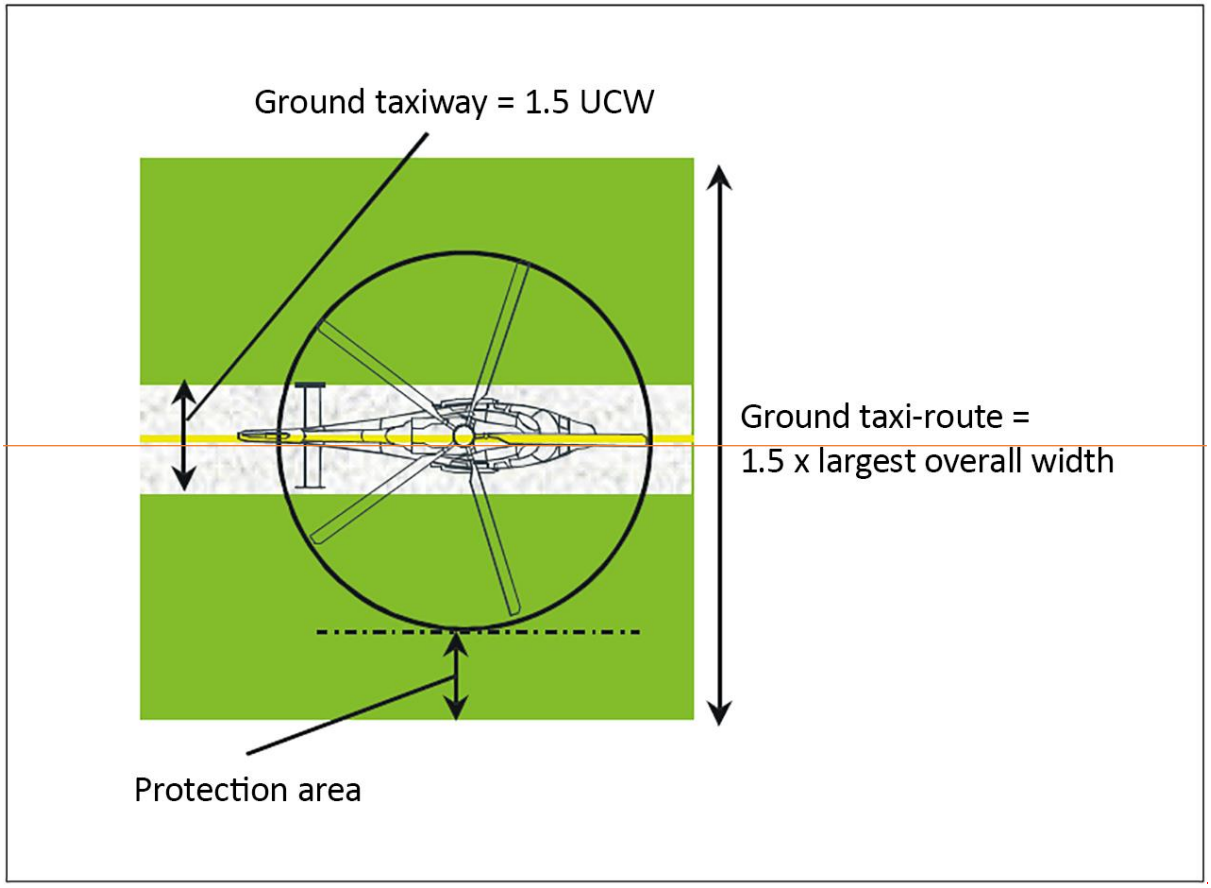
(D) ensures effective drainage while having no adverse effect on the control or stability of a wheeled helicopter when being manoeuvred under its own power, or when stationary.

(2) The minimum width of a helicopter taxiway should be the lesser of:

(i) two times the undercarriage width (UCW) of the most demanding helicopter the taxiway is intended to serve; or

(ii) a width meeting the requirements of (b)(1)(i).

(3) The transverse slope of a helicopter taxiway should not exceed 2 per cent and the longitudinal slope should not exceed 3 per cent.



~~*Figure C-1. Helicopter ground taxi-route/taxiway*~~

Rationale

The amendment of the present paragraph and of the whole Chapter is based on amendment 9 of Annex 14 Vol. II and in particular on the new approach towards defining the taxiways and taxi-routes. In place

of the previous separation between ground taxiways and taxi-routes on the one hand, and air taxiways and taxi-routes on the other hand, ICAO's new approach entails the use of the term 'helicopter taxiway', without any distinction indicating its use (for ground-taxiing or air-taxiing), and of the terms 'ground taxi-route' and 'air taxi-route'. The 'helicopter taxiways' correspond as a physical entity to the 'taxiways' as defined in CS-ADR-DSN. They are associated with ground taxi-routes or air taxi-routes. In the former case, they can be used only by wheeled helicopters for ground taxiing. In the latter case, they can be used by both wheeled and skidded helicopters for air taxiing and by wheeled helicopters for ground taxiing. On the other hand, it is possible to define an air taxi-route that is not collocated with a taxiway. However, in this case, ground taxiing is not permitted.

Due to the change of concept that was described above, current Chapter C of CS-HPT-DSN is proposed to be completely re-organised: The present paragraph contains only the provisions for helicopter taxiways. The ones for ground taxi-routes are proposed to be transferred to paragraph CS HPT-DSN.C.210, which will cover the common requirements for both ground taxi-routes and air taxi-routes, and the proposed new paragraphs CS HPT-DSN.C.211 and CS HPT-DSN.C.212, that contain the rest individual requirements for ground taxi-routes and air taxi-routes. The following table indicates the correspondence of the current provisions of CS HPT-DSN.C.210 with the proposed ones.

Current provision in CS HPT-DSN.C.200	***Position of equivalent provision in the proposed paragraphs***	***Comments***
(b)(1)	*CS HPT-DSN.C.200(b)(1)* *CS HPT-DSN.C.200(b)(2)*	*The minimum width is increased to 2 times the UCW, but flexibility provision is also introduced, in line with Annex 14 Vol. II.*
(b)(2)	*CS HPT-DSN.C.200(b)(3)*	
(b)(3)	*CS HPT-DSN.C.200(b)(1)(ii)(A)*	
(b)(4)	*CS HPT-DSN.C.211(a)*	*Worded vice-versa: The taxi-route is centred on the taxiway.*
(b)(5)	*CS HPT-DSN.C. 211(a)*	
(b)(6)	*CS HPT-DSN.C.210(a)(1)*	
(b)(7)	-	*Operational requirement (ADR.OPS.B.029)*
(b)(8)	*CS HPT-DSN.C. 211(b)*	
(b)(9)	*CS HPT-DSN.C.200(b)(1)(ii)(D),* *CS HPT-DSN.C.200(b)(3), and* *CS HPT-DSN.C.210(a)(2)(i)(C)* *CS HPT-DSN.C.211(c)*	*A specific maximum value for the longitudinal slope of the helicopter taxiway and for the transverse slope of the helicopter taxi-route have been added in line with Annex 14 Vol. II.*
(b)(10)	*CS HPT-DSN.C.200(b)(1)(ii)(C)*	
(b)(11)	*CS HPT-DSN.C.210(b)*	

In addition to the above, a new provision is proposed to be included, in line with amendment 9 of Annex 14 Vol. II, by which the need for the surface of the helicopter taxiway to be free of irregularities is expressed explicitly.

Furthermore, it was considered that Figure C-1 is more suitably placed in paragraph CS HPT-DSN.C.211 which is related to ground taxi-routes. Therefore, it is proposed to be moved there. Moreover, due to the change of the concept and the requirements for taxiways, the term 'ground' has been deleted, the factor '1.5' in front of the term 'UCW' has been replaced by '2', in line with the proposed amendment, and a note referring to the minimum width according to CS HPT-DSN.C.200(b)(2)(ii) has been added.

GM1 HPT-DSN.C.200 Helicopter ~~ground~~ taxiways ~~and helicopter ground taxi-routes~~

When a taxiway is intended for use by aeroplanes and helicopters, the provisions for aeroplane taxiways ~~for aeroplanes~~, taxiway shoulders, taxiway strips, ~~and~~ helicopter ~~ground~~ taxiways and taxi-routes ~~will be~~ are taken into consideration and the more stringent requirements apply.

Rationale

The proposed amendment of the current GM aims at clarifying which aspects of the taxiways should be considered, when considering the most stringent requirements to be applied.

CS HPT-DSN.C.210 Helicopter ~~air taxiways and helicopter air~~ taxi-routes

~~(a) General: A helicopter air taxiway should be designed so as to permit the movement of a helicopter above the surface at a height normally associated with ground effect and at ground speed less than 37 km/h (20 kt).~~

~~(b) Characteristics:~~

~~(1) The width of a helicopter air taxiway should be at least two times the largest width of the undercarriage (UCW) of the helicopters that the helicopter air taxiway is intended to serve (see Figure C-2).~~

~~(2) The surface of a helicopter air taxiway should be static load-bearing.~~

~~(3) The slopes of the surface of a helicopter air taxiway should not exceed the slope landing limitations of the helicopters the helicopter air taxiway is intended to serve.~~

~~(4) The transverse slope of a helicopter air taxiway should not exceed 10 per cent.~~

~~(5) The longitudinal slope of a helicopter air taxiway should not exceed 7 per cent.~~

~~(6) A helicopter air taxiway should be centred on a helicopter air taxi-route.~~

~~(7) A helicopter air taxi-route should extend symmetrically on each side of the centre line for a distance at least equal to the largest overall width of the helicopters it is intended to serve.~~

~~(8) No fixed object should be permitted above the surface on an air taxi-route, except for frangible objects, which, because of their function, must be located there.~~

~~(9) No mobile object should be permitted on an air taxi-route during helicopter movements.~~

~~(10) Objects above ground level whose function requires them to be located on a helicopter air taxi-route should not:~~

~~(i) be located at a distance of less than 1 m from the edge of the helicopter air taxiway, or at a distance of less than 0.5 times the largest overall width of the helicopter for which the helicopter air taxi-route is designed from the centre line of the helicopter air taxiway, whichever is greater; and~~

~~(ii) penetrate a plane originating at a height of 25 cm above the plane of the helicopter air taxiway, and sloping upwards and outwards at a gradient of 5 per cent, at a distance of 1 m from the edge of the helicopter air taxiway, or at a distance of 0.5 times the largest overall width of the helicopter for which the helicopter air taxi-route is designed from the centreline of the helicopter air taxiway, whichever is lower.~~

~~(11) The surface of a helicopter air taxi-route should be resistant to the effect of rotor downwash.~~

~~(12) The surface of a helicopter air taxi-route should provide ground effect.~~

~~(13) For simultaneous operations, the helicopter air taxi-routes should not overlap.~~

(a) A helicopter taxi-route should provide:

(1) an area free of obstacles, except for frangible essential objects which because of their function are located on it, established for the movement of helicopters and with sufficient width to ensure containment of the largest helicopter the taxi-route is intended to serve;

(2) a surface which is resistant to the effects of rotor downwash, and

(i) when collocated with a helicopter taxiway:

(A) is contiguous and flush with the taxiway;

(B) does not present a hazard to operations; and

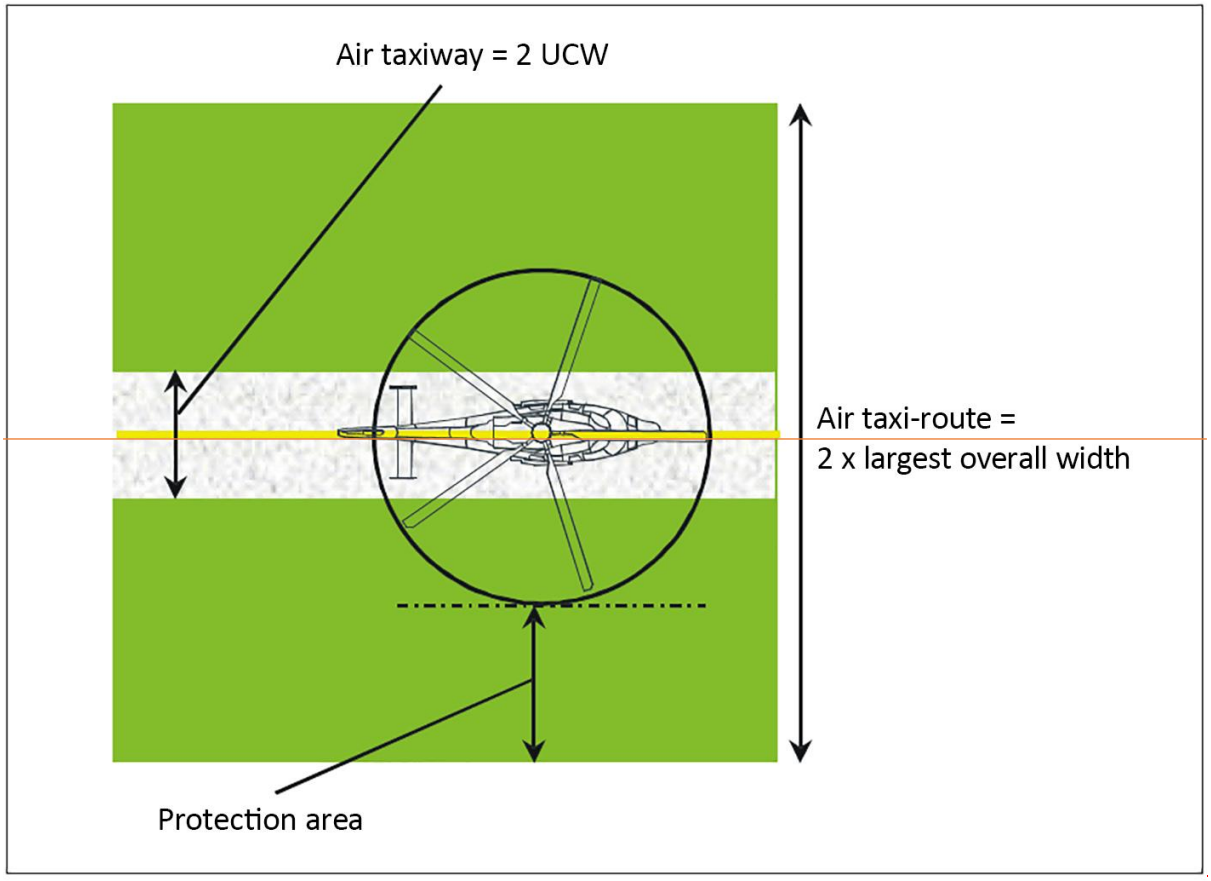
(C) ensures effective drainage; and

(ii) when not collocated with a helicopter taxiway and for the event of a forced landing:

(A) is free of hazards; and

(B) has sufficient bearing strength.

(b) For simultaneous operations, the taxi-routes should not overlap.



~~Figure C-2. Helicopter air taxi-route/taxiway~~

Rationale

See rationale for CS HPT-DSN.C.200.

The following table indicates the correspondence of the current provisions of CS HPT-DSN.C.210 with the proposed ones.

Current provision in CS HPT-DSN.C.210	***Position of equivalent provision in the proposed paragraphs***	***Comments***
(a)	*CS HPT-DSN.C.212(a)(1)*	
(b)(1)	*CS HPT-DSN.C.200(b)(2)*	*The minimum width remains equal to 2 times the UCW, but flexibility provision is also introduced, in line with Annex 14 Vol. II.*
(b)(2)	*CS HPT-DSN.C.200(b)(1)(ii)(A) and CS HPT-DSN.C.210(a)(2)(ii)(B)*	
(b)(3)	*CS HPT-DSN.C.200(b)(3) and CS HPT-DSN.C.212(b)(3)*	
(b)(4)	*CS HPT-DSN.C.200(b)(3) and CS HPT-DSN.C.212(b)(3)*	

(b)(5)	*CS HPT-DSN.C.200(b)(3) and CS HPT-DSN.C.212(b)(3)*	
(b)(6)	*CS HPT-DSN.C.212(b)(2)(i)*	*Worded vice-versa: The taxi-route is centred on the taxiway. However, the existence of a helicopter taxiway is not required in all cases.*
(b)(7)	*CS HPT-DSN.C.212(b)(1)*	
(b)(8)	*CS HPT-DSN.C.210(a)(1)*	
(b)(9)	-	*Operational requirement (Part-OPS)*
(b)(10)	*CS HPT-DSN.C.212(b)(2)(iii)*	
(b)(11)	*CS HPT-DSN.C.210(a)(2)*	
(b)(12)	*CS HPT-DSN.C.212(b)(4)*	
(b)(13)	*CS HPT-DSN.C.210(b)*	

Provision (a)(2) includes three new requirements in line with amendment 9 of Annex 14 Vol. II. In particular, that the taxi-route surface should be contiguous and flush with the helicopter taxiway, and should not present a hazard to operations, when collocated with a taxiway, and that it should be free of hazards for the event of a forced landing, when not collocated with a helicopter taxiway.

Moreover, the current CS-HPT-DSN (and Annex 14 Vol. II before the adoption of amendment 5) includes the requirement that the air taxiway should be static load bearing. With the change of concept, an air taxiway is not defined, and therefore the abovementioned requirement has been deleted with amendment 5 of Annex 14 Vol. II. This means that in cases of air taxi-routes not collocated with taxiways, the central part of the taxi-route is not required to have any specific load bearing strength. As a remedy, it is proposed that point (a)(2)(ii)(B) is included, based on which the taxi-route should exhibit a sufficient bearing strength for the event of a forced landing.

Furthermore, it should be mentioned that with Annex 14 Vol. II, the provisions for ground and air taxi-routes, that are equivalent to provision (b), were deleted. However, at the same time, a new Note was added at the beginning of the section related to taxiways and taxi-routes, that states: 'The specifications for ground taxi-routes and air taxi-routes are intended for the safety of simultaneous operations during the manoeuvring of helicopters. The effect of wind velocity/turbulence induced by the rotor downwash would need to be considered.' It is therefore implied that since the minimum width of the taxi-routes is defined such that simultaneous operations are allowed, then the overlapping of the taxi-routes is not allowed, since this in effect reduces its width. For clarity, the new proposed provision (b) is based on the current wording of the relevant provisions. The second sentence of the above-mentioned Note was added to the corresponding GM.

Finally, it was considered that Figure C-2 is more suitably placed in paragraph CS HPT-DSN.C.212 which is related to air taxi-routes. Therefore, it is proposed to be moved there. Moreover, the Figure is proposed to be supplemented with the depiction of the case of an air-taxi route not collocated with a helicopter taxiway.

GM1 HPT-DSN.C.210 Helicopter ~~air taxiways and helicopter air~~ taxi-routes

~~The part of the helicopter air taxi-route that extends symmetrically on each side of the centre line from 0.5 times the largest overall width of the helicopters it is intended to serve to the outermost limit of the helicopter air taxi-route is its protection area.~~

In case of simultaneous operations, and in order to determine the required separation between taxi-routes, the effect of wind velocity/turbulence induced by rotor downwash needs to be considered. Because of potential interference, adjacent siting especially of air taxi-routes is not recommended. See also GM1 HPT-DSN.F.600.

Rationale

The current GM is proposed to be deleted, because the principle that a part of a taxi-route is defined as the protection of the taxiway has been removed. The objective of the taxi-route compensates for manoeuvring errors and ensures containment.

A new text is proposed to be added related to the factors that should be considered when intending to design taxi-routes in the vicinity of each other. (See rationale for the corresponding CS.) A reference to GM1 HPT-DSN.F.600 has also been added, which mentions the aspect of the accuracy of air-taxiing, when only air taxi-route markers are available.

CS HPT-DSN.C.211 Helicopter ground taxi-routes

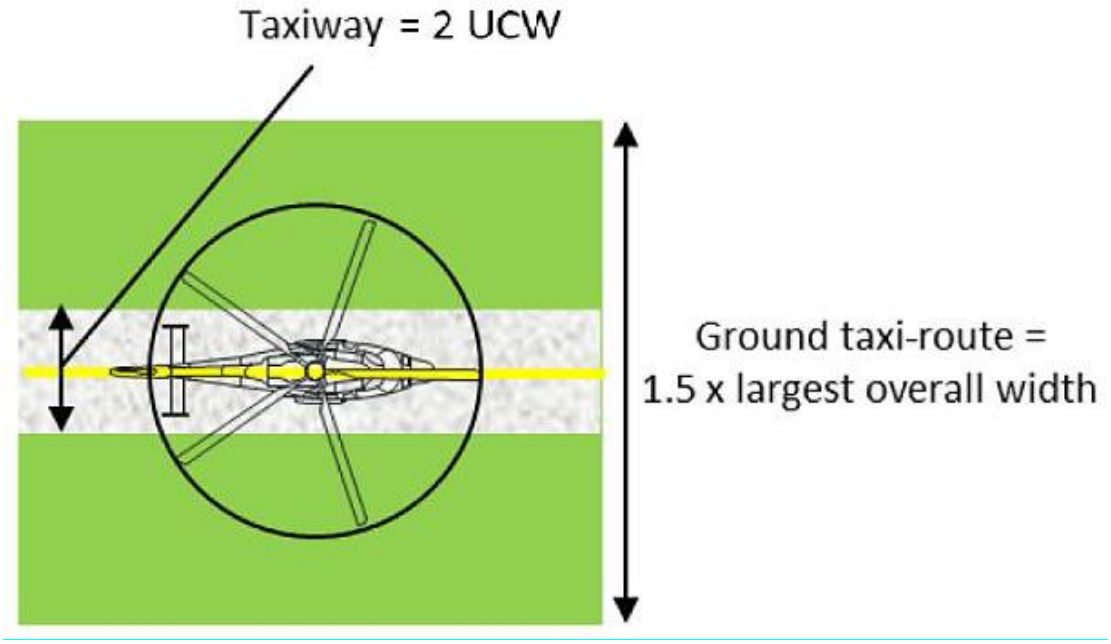
(a) A helicopter ground taxi-route should have a minimum width of 1.5 x the overall width of the largest helicopter it is intended to serve, and be centred on a taxiway (see Figure C-1).

(b) The essential objects, mentioned in CS HPT-DSN.C.210(a)(1), should not:

(1) be located at a distance of less than 50 cm outwards from the edge of the helicopter taxiway; and

(2) penetrate a surface originating 50 cm outwards of the edge of the helicopter taxiway and at a height of 25 cm above the surface of the taxiway and sloping upwards and outwards at a gradient of 5 per cent.

(c) The ground taxi-route should not exceed an upward transverse slope of 4 per cent outwards from the edge of the taxiway.



Note – See also CS HPT-DSN.C.200(b)(2)(ii) regarding the width of the taxiway.

Figure C-1. Helicopter taxiway/ground taxi-route

Rationale

The current CS is proposed to be added, to include the provisions that are applicable exclusively to ground taxi-routes. While points (a) and (b) have their equivalent in the current CS-HPT-DSN, point (c) introduces a new requirement regarding the transverse slope of the ground taxi-routes in line with Annex 14 Vol. II.

See also the rationale under CS HPT-DSN.C.200.

GM1 HPT-DSN.C.211 Helicopter ground taxi-routes

Ground taxi-routes are meant for use by wheeled helicopters, for ground taxiing only.

Rationale

The current GM is proposed to be added to clarify the intended use of the ground taxi-routes.

CS HPT-DSN.C.212 Helicopter air taxi-routes

(a) General: A helicopter air taxi-route should be designed so as to permit the movement of a helicopter above the surface at a height normally associated with ground effect and at ground speed less than 37 km/h (20 kt).

(b) Characteristics:

(1) A helicopter air taxi-route should have a minimum width of twice the overall width of the largest helicopter it is intended to serve (see Figure C-2).

(2) When collocated with a taxiway for the purpose of permitting both ground and air taxi operations:

(i) the helicopter air taxi-route should be centred on the taxiway;

(ii) its surface should not exceed an upward transverse slope of 4 per cent outwards from the edge of the taxiway; and

(iii) the essential objects, mentioned in CS HPT-DSN.C.210(a)(1), should not:

(A) be located at a distance of less than 50 cm outwards from the edge of the helicopter taxiway; and

(B) penetrate a surface originating 50 cm outwards of the edge of the helicopter taxiway and a height of 25 cm above the surface of the taxiway and sloping upwards and outwards at a gradient of 5 per cent.

(3) When not collocated with a taxiway, the slopes of the surface of an air taxi-route should not exceed the slope landing limitations of the helicopters the taxi-route is intended to serve. In any event, the transverse slope should not exceed 10 per cent and the longitudinal slope should not exceed 7 per cent.

(4) The surface of a helicopter air taxi-route should provide ground effect.

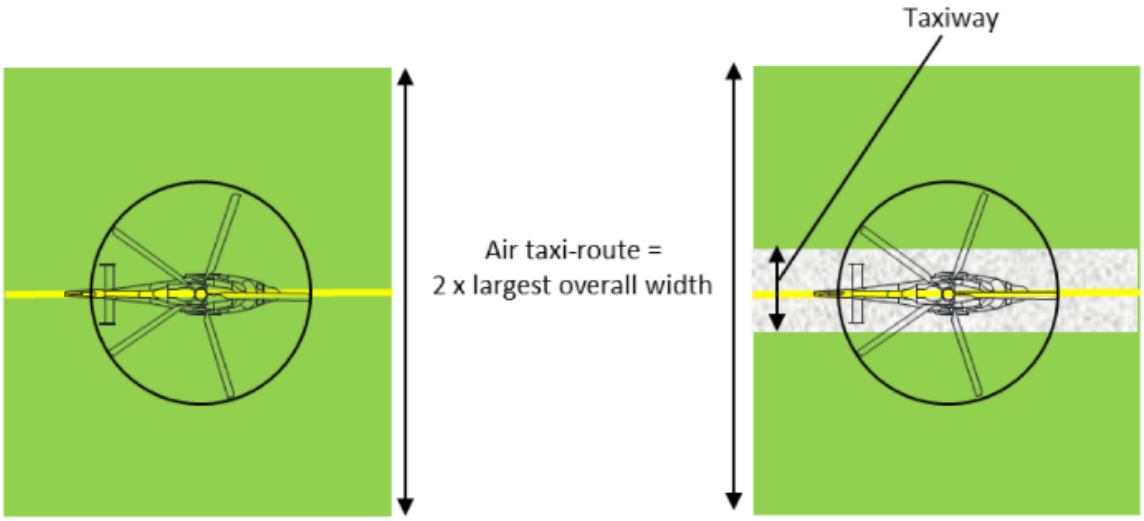


Figure C-2. Helicopter air taxi-route and combined helicopter taxiway/air taxi-route

Rationale

The current CS is proposed to be added, to include the provisions that are applicable exclusively to air taxi-routes. See also the rationale under CS HPT-DSN.C.210.

Point (b)(2)(ii) introduces a new requirement regarding the transverse slope of the air taxi-routes in line with Annex 14 Vol. II, which is identical to the ground taxiways. However, this requirement is not applicable in the case of air taxi-routes not collocated with taxiways for which point (b)(3) applies.

Furthermore, one change in the requirements, that should be pointed out, is related to the minimum distance from the helicopter taxiway edge, that the essential objects could be installed. Based on the current requirements this distance is 1 m. However, with amendment 9 of Annex 14 Vol. II, this distance has been reduced to 0.5 m. It is proposed that the new requirement is included in the CS HPT-DSN.C.212(b)(2)(iii), since such objects are frangible and their presence closer to the taxiway does not constitute a hazard to the operations.

GM1 HPT-DSN.C.212 Helicopter air taxi-routes

(a) An air taxi-route not collocated with a taxiway is meant for use for air taxiing only. However, when collocated with a helicopter taxiway, it can be used both for air-taxiing and for ground taxiing (of wheeled helicopters).

(b) The effect of downwash on other users and infrastructure should be considered when siting an air taxi-route.

(c) Unpaved helicopter air taxi-routes have a reduced ability to accommodate markings and inset lights. This would lead to an inability to satisfy the provisions of CS-ADR-DSN at parts of the movement area, where such visual aids are important for the safety of the operations, e.g. at runway holding positions or complex taxiway intersections. At least the central part of the helicopter taxiway should be paved. In such a case, the pavement need not exhibit the bearing strength that a helicopter taxiway would have, if it were provided.

Rationale

The first point of the proposed GM clarifies the intended use of the air taxi-routes. The use of an air taxi-route for ground taxiing is allowed by the fact that all the requirements of a ground taxi-route are satisfied by the requirements of the air taxi-route, when the latter is collocated with a helicopter taxiway.

The second point is related to the need to consider the effects of downwash to other users in an aerodrome and to the aerodrome facilities. Although this is a consideration also in the case of ground taxiing, it is mentioned specifically for the case of air-taxiing, since in this case, the downwash is particularly strong.

Regarding the third point, see the rationale of the corresponding CS.

CHAPTER D — HELICOPTER STANDS

CS HPT-DSN.D.300 Helicopter stands

~~(a) Characteristics:~~

~~(1) When a TLOF is collocated with a helicopter stand, the protection area of the stand should not overlap the protection area of any other helicopter stand or associated taxi route.~~

~~(2) A helicopter stand should provide rapid drainage.~~

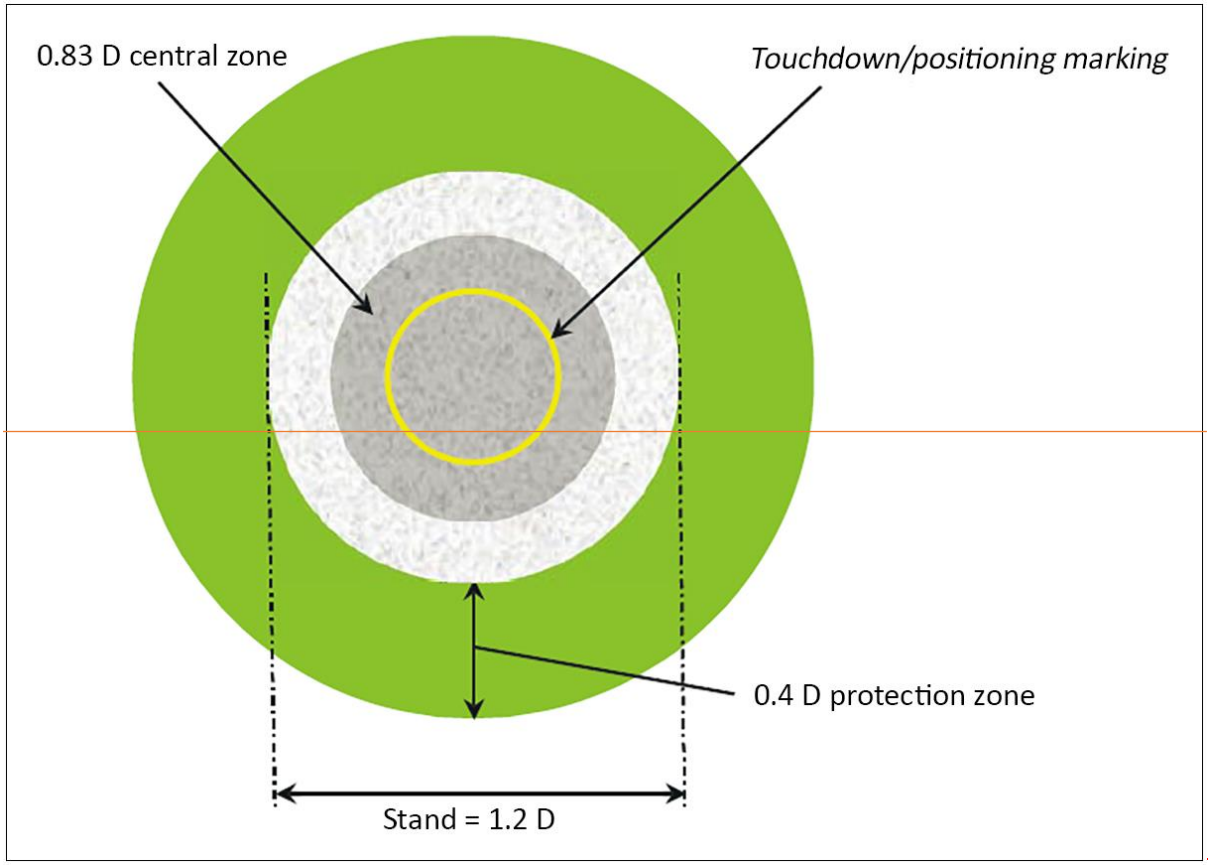
~~(3) The slope of a helicopter stand in any direction should not exceed 2 per cent.~~

~~(4) When used by helicopters turning in a hover, a helicopter stand should be of sufficient size to contain a circle of diameter of at least 1.2 D of the largest helicopter the stand is intended to serve (see Figure D-1).~~

~~(5) Where a helicopter stand is intended to be used for taxi-through and where the helicopter using the stand is not required to turn, the minimum width of the stand and associated protection area should be that of the taxi-route.~~

~~(6) Where a helicopter stand is intended to be used for turning, the minimum overall dimension of the stand and protection area should not be less than 2 D.~~

~~(7) Where a helicopter stand is intended to be used for turning, the helicopter stand should be surrounded by a protection area which extends for a distance of 0.4 D from the edge of the helicopter stand.~~



~~***Figure D-1. Helicopter stand and associated protection area permitting the helicopter to turn in a hover when operating***~~

~~(8) For simultaneous operations, the protection areas of helicopter stands and their associated taxi-routes should not overlap (see Figure D-2).~~

~~(9) A helicopter stand and the associated protection area intended to be used for air taxiing should provide ground effect.~~

~~(10) No fixed object should be permitted above the surface of the ground on a helicopter stand, except for tie-down points with a height of less than 5 cm, which can be accommodated if needed.~~

~~(11) No fixed object should be permitted above the surface of the ground in the protection area around a helicopter stand except for frangible objects which, because of their function, must be located there.~~

~~(12) No mobile object should be permitted on a helicopter stand and the associated protection area during helicopter movements.~~

~~(13) Objects whose function requires them to be located in the protection area at a distance of less than 0.75 D from the centre of the helicopter stand, should not exceed 5 cm in height.~~

~~(14) Objects whose function requires them to be located in the protection area should not:~~

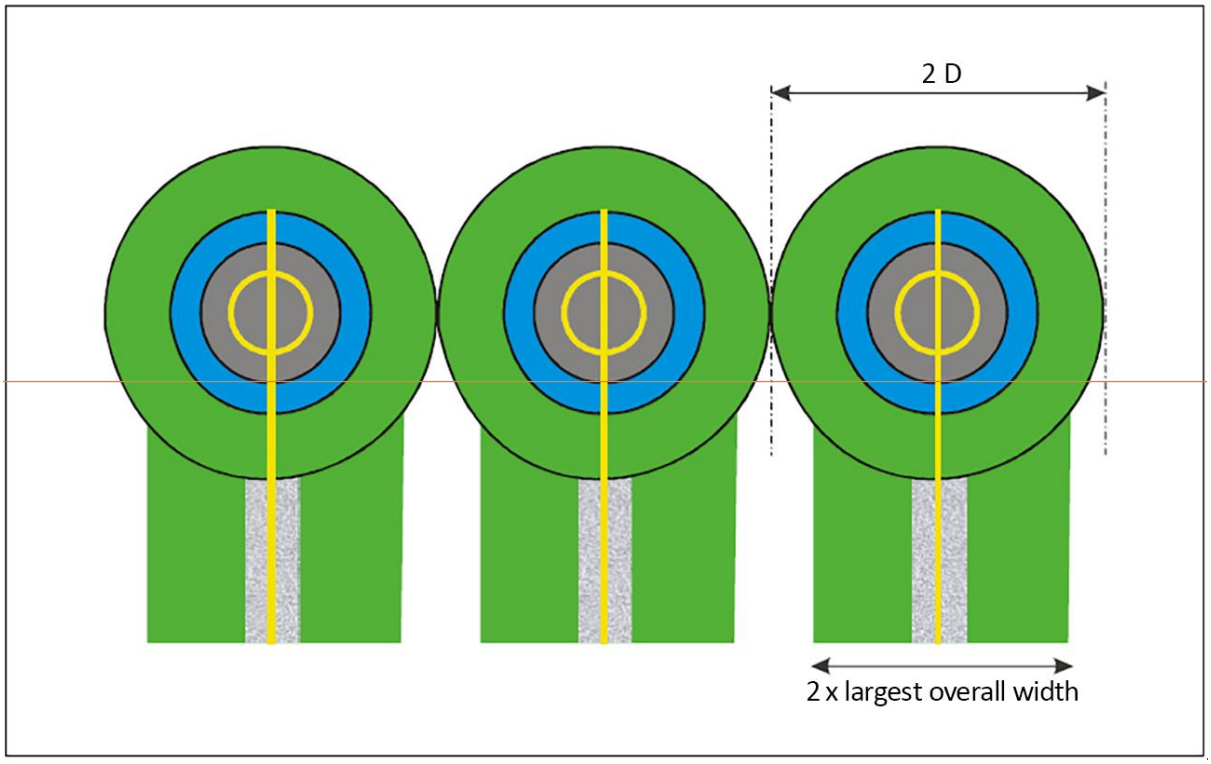
~~(i) if located at a distance of less than 0.75 D from the centre of the helicopter stand, penetrate a plane at a height of 5 cm above the plane of the central zone; and~~

~~(ii) if located at a distance of 0.75 D or more from the centre of the helicopter stand, penetrate a plane at a height of 25 cm above the plane of the central zone and sloping upwards and outwards at a gradient of 5 per cent.~~

~~(15) The central zone of a helicopter stand should be capable of withstanding the traffic of helicopters it is intended to serve and have a static load-bearing area:~~

~~(i) of diameter not less than 0.83 D of the largest helicopter it is intended to serve; or~~

~~(ii) for a helicopter stand intended to be used for taxi-through, and where the helicopter using the stand is not required to turn, the same width as the helicopter ground taxiway.~~



~~***Figure D-2. Helicopter stands designed for hover turns with air taxi routes/taxiways — simultaneous operations***~~

(a) A helicopter stand should provide:

(1) an area free of obstacles and of sufficient size and shape to ensure containment of every part of the largest helicopter the stand is intended to serve when it is being positioned within the stand;

(2) a surface which:

(i) is resistant to the effects of rotor downwash;

(ii) is free of irregularities that would adversely affect the manoeuvring of helicopters;

(iii) has bearing strength capable of withstanding the intended loads;

(iv) has sufficient friction to avoid skidding of helicopters or slipping of persons;

(v) ensures effective drainage while having no adverse effect on the control or stability of a wheeled helicopter when being manoeuvred under its own power, or when stationary; and

(vi) when it is intended to be used for hover turning or air-taxiing, provides ground effect.

(b) The minimum dimensions of a helicopter stand should be:

(1) a circle of diameter of 1.2 D of the largest helicopter the stand is intended to serve; or

(2) when there is a limitation on manoeuvring and positioning, of sufficient width to meet the requirement of (a)(1) above but not less than 1.2 times overall width of the largest helicopter the stand is intended to serve.

(c) The mean slope of a helicopter stand in any direction should not exceed 2 per cent.

(d) Each helicopter stand should be provided with positioning markings to clearly indicate where the helicopter is to be positioned and, by their form, any limitations on manoeuvring.

(e) A stand should be surrounded by a protection area.

Rationale

With amendment 9 of Annex 14 Vol. II, the protection area has been made an associated attribute of a helicopter stand. Therefore, as in Annex 14 Vol. II, it is proposed that the provisions for the protection area are split from the ones for the stands and form a new paragraph CS HPT-DSN.D.310. The following table indicates the correspondence of the current provisions of CS HPT-DSN.D.300 with the proposed ones.

Current provision in CS HPT-DSN.D.300	***Position of equivalent provision in the proposed paragraphs***	***Comments***
(a)(1)	*CS HPT-DSN.D.310(d) and (e)*	*The proposed provisions distinguish between simultaneous and non-simultaneous use of the stand.*
(a)(2)	*CS HPT-DSN.D.300(a)(2)(v)*	
(a)(3)	*CS HPT-DSN.D.300(c)*	
(a)(4)	*CS HPT-DSN.D.300(b)*	*Flexibility provision is also introduced, in line with Annex 14 Vol. II.*
(a)(5)	*CS HPT-DSN.D.310(c)*	
(a)(6)	*CS HPT-DSN.D.300(b)(1) and CS HPT-DSN.D.310(b)*	
(a)(7)	*CS HPT-DSN.D.310(b)*	
(a)(8)	*CS HPT-DSN.D.310(d)*	
(a)(9)	*CS HPT-DSN.D.300(a)(2)(vi) and CS HPT-DSN.D.310(a)(2)(iv)*	
(a)(10)	*CS HPT-DSN.D.300(a)(1)*	*Possibility of tie-down points extending above the surface has been deleted.*
(a)(11)	*CS HPT-DSN.D.310(a)(1)*	
(a)(12)	-	*Operational requirement.*
(a)(13)	*CS HPT-DSN.D.310(f)(1)*	
(a)(14)	*CS HPT-DSN.D.310(f)*	
(a)(15)	*CS HPT-DSN.D.300(a)(2)(iii) and CS HPT-DSN.C.200(b)(1)(ii)(A)*	

In addition to the above, and in line with amendment 9 of Annex 14 Vol. II, it is proposed that a few new requirements are introduced in the current CS. In particular, that the surface of the stand is resistant to the rotor downwash, is free of irregularities and has sufficient friction. All these

requirements are safety-related and self-explanatory. Their addition improves the consistency of the provisions across CS-HPT-DSN. Moreover, the requirement that the stand is provided with positioning markings is also proposed to be added explicitly. Point (e) regarding the requirement that a stand is surrounded by a protection area is proposed to be added. This is considered necessary, because of the splitting of the provisions for stands and for protection areas in two different paragraphs.

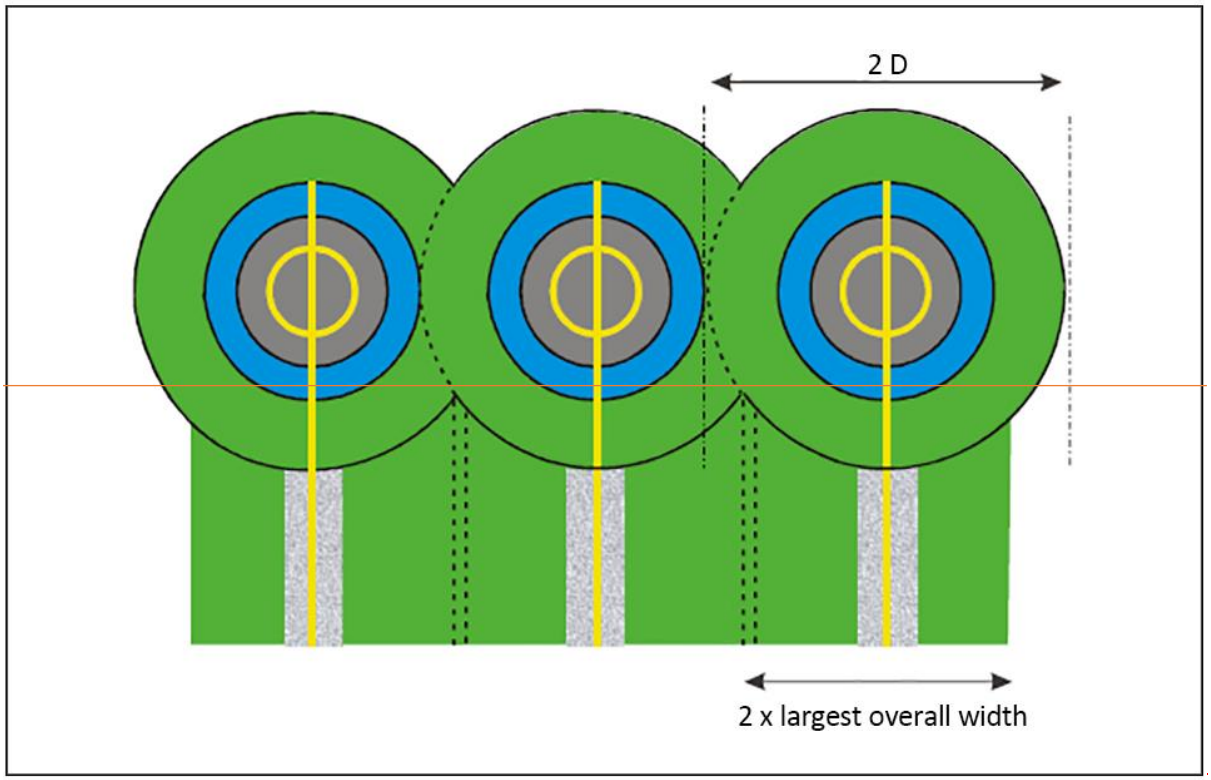
It should be pointed out that the current possibility of having tie-down points that extend to a height of 5 cm is proposed not to be maintained. This will align the CS with the Annex 14 Vol. II requirements. In any case, suitably constructed in-pavement tie-down points are not an obstacle in the sense of CS HPT-DSN.D.300(a)(1) or an irregularity in the sense of CS HPT-DSN.D.300(a)(2)(ii), and can still be used.

Furthermore, current Figures D-1 and D-2 are proposed to be deleted, and new Figures D-1 to D-5 to be added, to provide illustrations of the relative position of the helicopter stands, the protection areas and the taxiways in various cases. The new Figures are proposed to be placed after the new paragraph on the protection areas.

GM1 HPT-DSN.D.300 Helicopter stands

(a) It is not considered good practice to locate helicopter stands under a flight path.

(b) ~~Where non-simultaneous operations are envisaged, the protection areas of helicopter stands and their associated taxi-routes may overlap (see Figure GM1-D-1).~~For a helicopter stand intended to be used for taxi-through only, a width less than 1.2D but which provides containment and still permits all required functions of a stand to be performed, might be used.(c) ~~Characteristics: For a helicopter stand intended to be used by wheeled helicopters for turning on the ground, the dimension of the helicopter stand and the protection area, including the dimension of the central zone, would need to be significantly increased.~~For a helicopter stand intended to be used for turning on the ground, the minimum dimensions may be influenced by the turning circle data provided by the manufacturer and are likely to exceed 1.2 D. See the Heliport Manual (Doc 9261) for further guidance.



~~*Figure GM1-D-1. Helicopter stands designed for hover turns with air taxi-routes/taxiways – non-simultaneous operations*~~

Rationale

The current text in point (b) – referring to the possibility of the protections areas to overlap – is considered superfluous, because this is covered in the new proposed CS HPT-DSN.D.310(e). The corresponding Figure GM1-D-1 is proposed to be deleted. It is proposed to be replaced by a reference to the possibility to reduce the width of the stand, if taxi-through only (no turning) is intended, under the condition that other relevant requirements are also satisfied. This is in line with amendment 9 of Annex 14, Vol. II.

Furthermore, with amendment 9 of Annex 14 Vol. II, the requirement of a central zone has been removed. Therefore, the current text in point (c) of the GM is proposed to be reworded based on Note 2 under point 3.1.45 of Annex 14 Vol. II.

CS HPT-DSN.D.310 Protection areas

(a) A protection area should provide:

(1) an area free of obstacles, except for frangible essential objects which because of their function are located on it; and

(2) a surface which:

(i) is contiguous and flush with the stand;

(ii) is resistant to the effects of rotor downwash;

(iii) ensures effective drainage; and

(iv) when it is intended to be used for hover turning or air-taxiing, provides ground effect.

(b) When associated with a stand designed for turning, the protection area should extend outwards from the periphery of the stand for a distance of 0.4D (see Figure D-1).

(c) When associated with a stand designed for taxi-through, the minimum width of the stand and protection area should not be less than the width of the associated taxi-route (see Figures D-2 and D-3).

(d) When associated with a stand designed for simultaneous use, the protection areas of adjacent stands and their associated taxi routes should not overlap.

(e) When associated with a stand designed for non-simultaneous use (see Figures D-4 and D-5):

(1) the protection areas of adjacent stands may overlap, but should not be less than the required protection area for the larger of the adjacent stands; and

(2) the adjacent non-active stand may contain a static object, but it should be wholly within the boundary of the stand.

(f) Essential objects located in the protection area should not:

(1) if located at a distance of less than 0.75 D from the centre of the helicopter stand, penetrate a surface at a height of 5 cm above the horizontal plane passing through the centre of the helicopter stand; and

(2) if located at a distance of 0.75 D or more from the centre of the helicopter stand, penetrate a surface at a height of 25 cm above the horizontal plane passing through the centre of the helicopter stand and sloping upwards and outwards at a gradient of 5 per cent.

(g) The slope of a protection area should not exceed an upward slope of 4 per cent outwards from the edge of the stand.

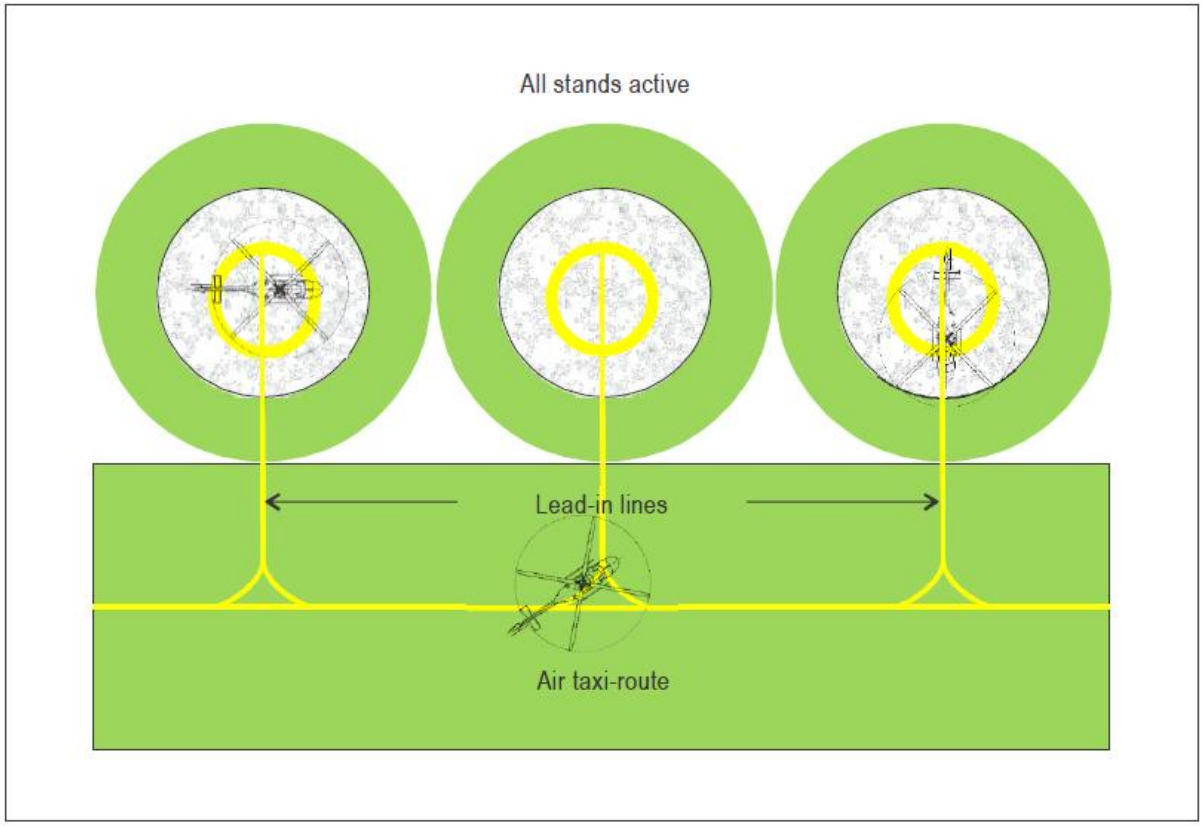


Figure D-1 Turning stands (with air taxi-routes) — simultaneous use

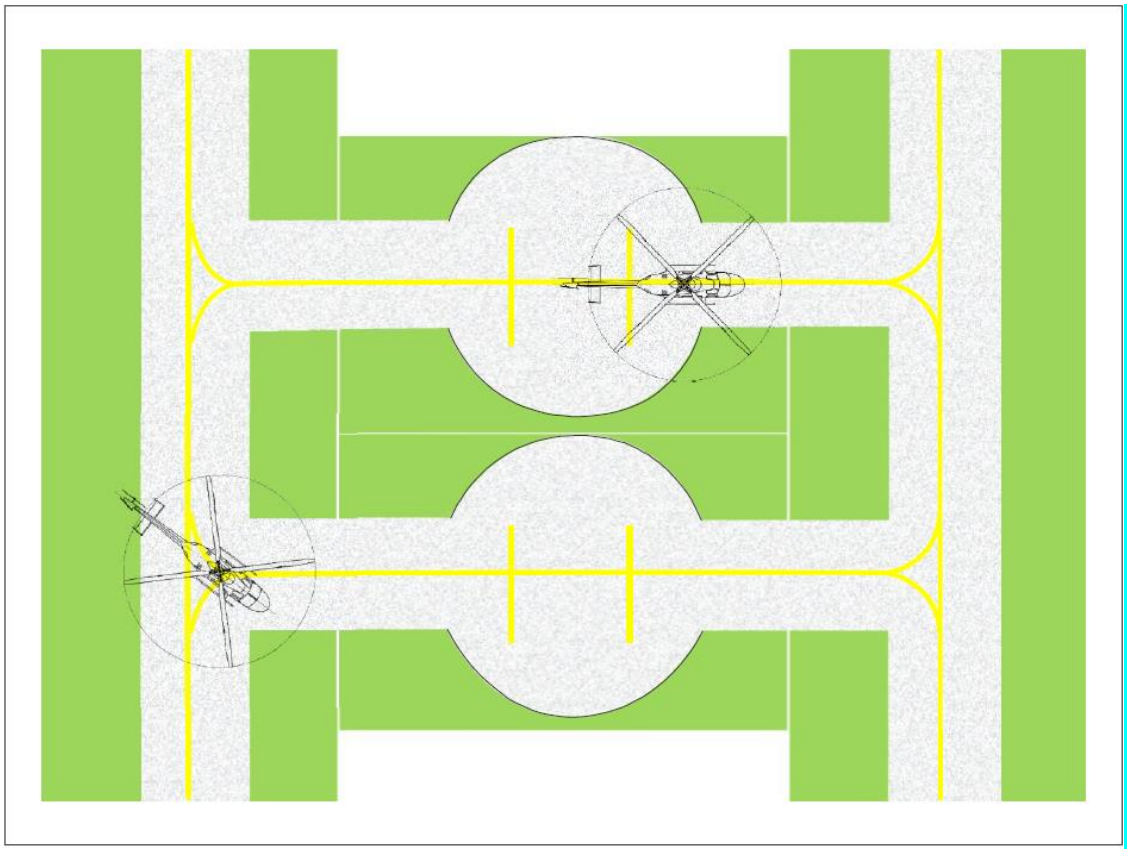


Figure D-2 Ground taxi-through stands (with taxiway/ground taxi-route) simultaneous use

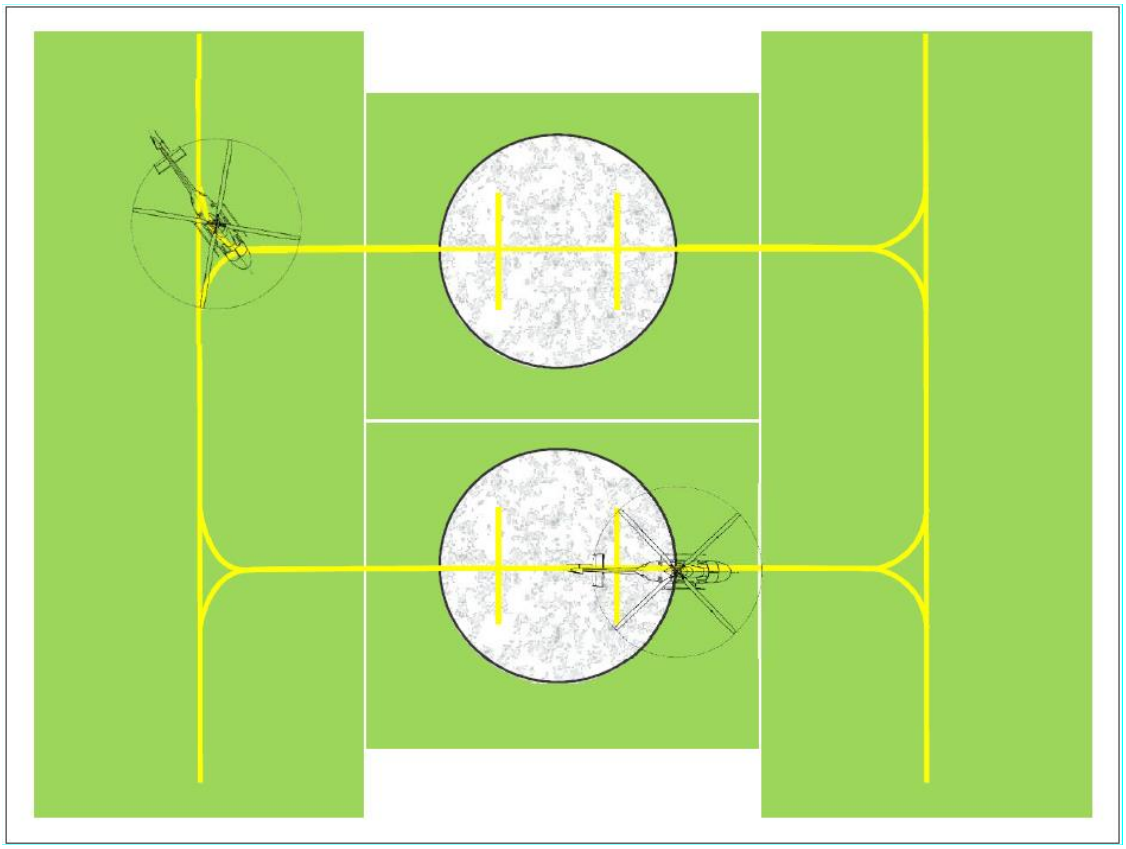


Figure D-3 Air taxi-through stands (with air taxi-route not collocated with a taxiway) simultaneous use.

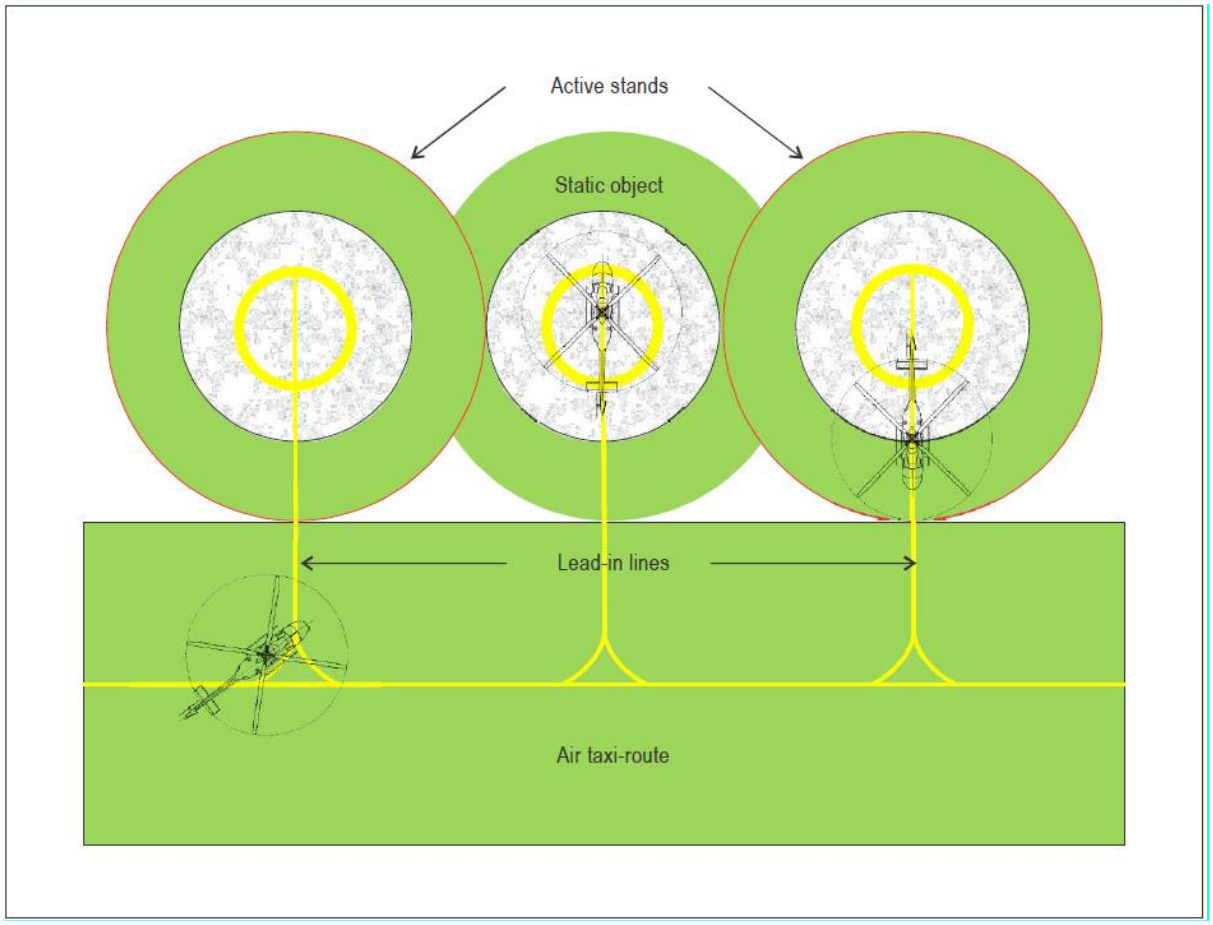


Figure D-4 Turning stands (with air taxi-routes) non-simultaneous use — outer stands active.

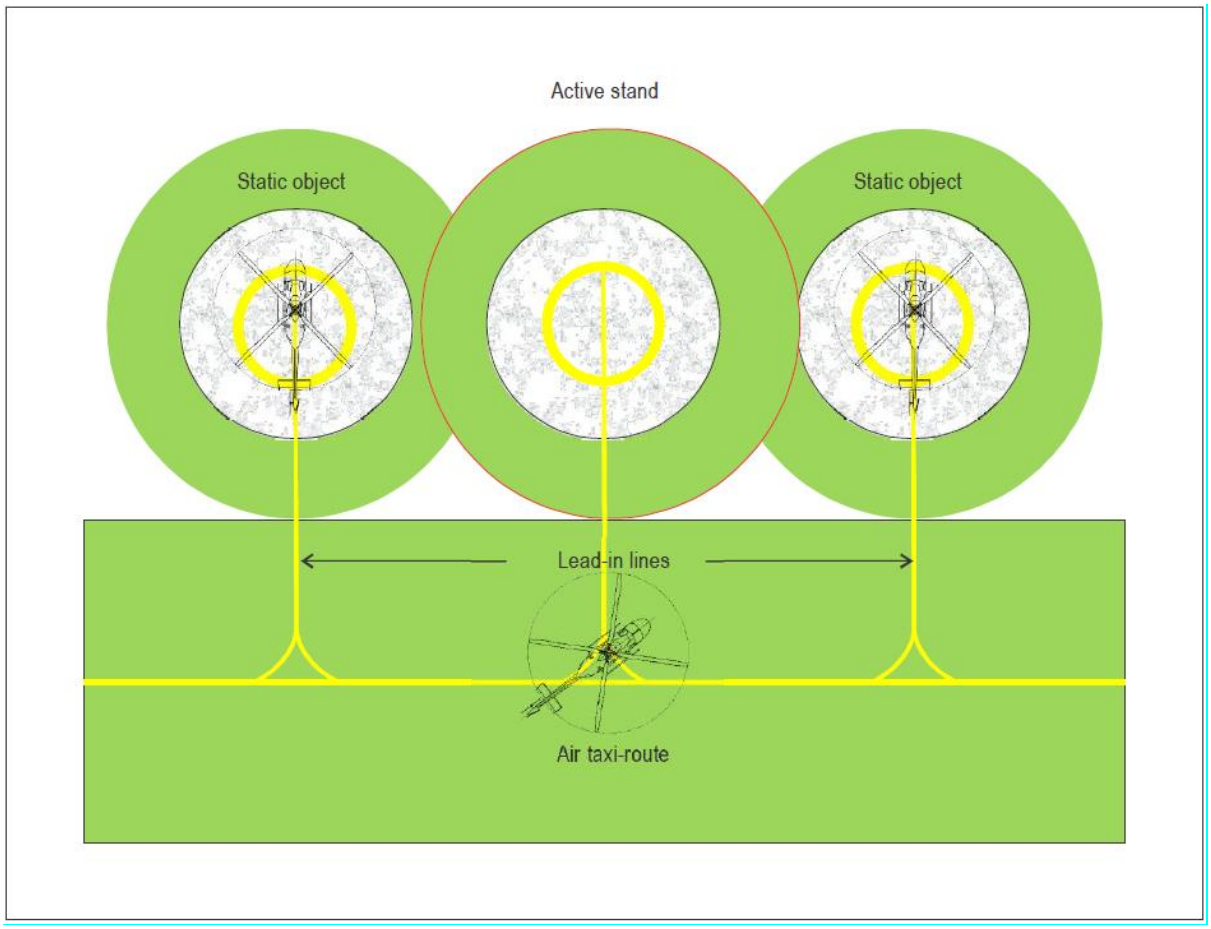


Figure D-5 Turning stands (with air taxi-route) non-simultaneous use — inner stand active.

Rationale

See rationale of CS HPT-DSN.D.300 regarding the current provisions for which it is proposed to be transferred to the new CS HPT-DSN.D.310.

In addition to these, it is proposed that a few new requirements are introduced in the current CS. In particular, that the surface of the protection area is contiguous and flush with the stand surface, is resistant to the rotor downwash and ensures effective drainage. All these requirements are safety-related, self-explanatory and stem from amendment 9 of Annex 14, Vol. II. Their addition improves the consistency of the provisions across CS-HPT-DSN.

Moreover, the requirement regarding the slope of the protection area is proposed to be added, since the current CS-HPT-DSN do not specify any value. The requirement that this slope does not exceed an upward 4 per cent value, is in line with Annex 14 Vol. II and is consistent with the corresponding value of the safety area of the FATO.

Furthermore, point (2)(i) regarding the requirement that a protection area is contiguous and flush with the stand is proposed to be added. This is considered necessary, because the stands and protection areas are treated separately and not as a single unified surface.

GM1 HPT-DSN.D.310 Protection area

(a) To ensure that only one of the adjacent stands is active at a time, instruction to pilots in the AIP make clear that a limitation on the use of the stands is in force.

(b) Where it is intended that the protection area (or part thereof) is used as a taxiway/taxi-route, the requirements are the most stringent between those of protection area and those of the taxiway and taxi-route.

Rationale

The first of the proposed points is contained as a Note in Annex 14 Vol. II and aims to indicate the necessary steps that should be taken by the aerodrome operator to assure that the helicopter flight crews are aware of possible restrictions regarding stand use.

The second point clarifies the requirements that should be satisfied at the parts of the protection areas that are used as taxiways or taxi-routes.

CHAPTER E — OBSTACLE LIMITATION SURFACES AND REQUIREMENTS

CS HPT-DSN.E.400 Applicability

The purpose of the obstacle limitation surfaces is to define the airspace around heliports to be maintained free from obstacles so as to permit the intended helicopter operations to be conducted safely.

Rationale

The proposed addition to the existing CS captures the essence of defining the obstacle limitation surfaces, that is missing in the present wording. An editorial addition is also proposed.

[…]

CS HPT-DSN.E.410 Approach surface

[…]

(b) Description: An inclined plane or a combination of planes or, when a turn ~~is~~or turns are involved, a complex surface sloping upwards from the inner edge~~end of the safety area~~ and centred on a line passing through the centre of the FATO (see Figures E-1, E-2, E-3 and E-4 and Table E-1).

(c) Characteristics:

(1) The limits of an approach surface should comprise:

(i) an inner edge, horizontal and perpendicular to the centre line of the approach surface, with a minimum width equal ~~in length~~ to the ~~minimum~~ specified width/diameter of the FATO plus the safety area~~, perpendicular to the centre line of the approach surface~~ and located at:

(A) the outer edge of the safety area; or

(B) when vertical procedures are being utilised, directly above the outer edge of the safety area;

(ii) two side edges originating at the ends of the inner edge diverging uniformly at a specified rate from the vertical plane containing the centre line of the FATO; and

(iii) an outer edge horizontal and perpendicular to the centre line of the approach surface ~~and~~ at:

(A) a ~~specified~~ height of 152 m (500 ft) above the elevation of the FATO~~.~~; or

(B) when a PinS approach procedure with proceed visually instruction is defined, a specified height above the elevation of the FATO.

(2) The elevation of the inner edge should be:

(i) the elevation of the FATO at the point on the inner edge that is intersected by the centre line of the approach surface; or~~. For heliports intended to be used by~~

~~helicopters operated in performance class 1, the inclined plane may be raised directly above the FATO.~~

(ii) when vertical procedures are being utilised, the level at which obstacle clearance is achieved.

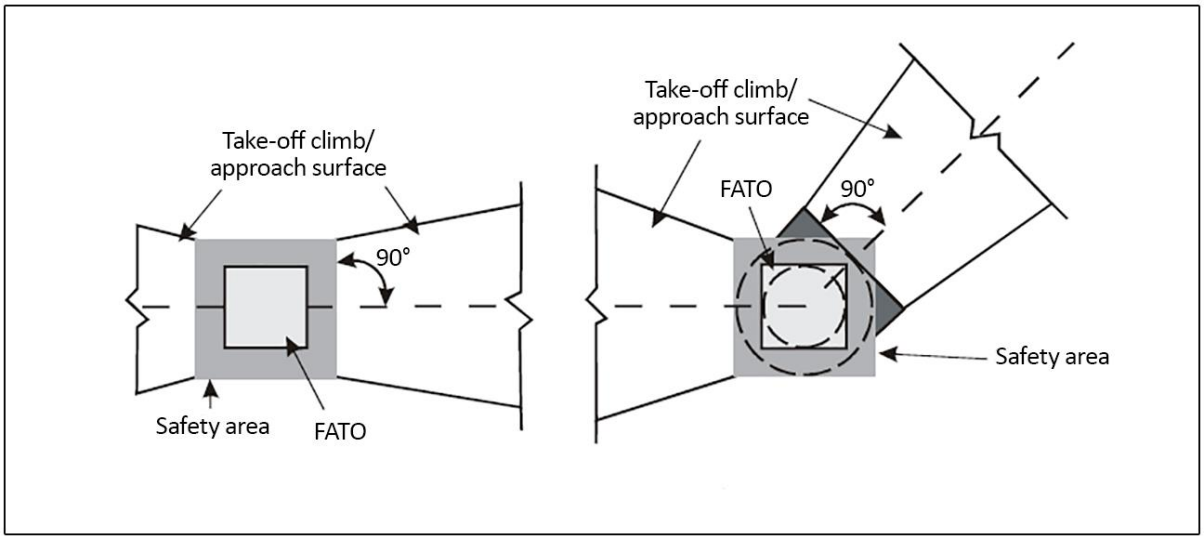
(3) The slope(s) of the approach surface should be measured in the vertical plane containing the centre line of the surface.

(4) In the case of an approach surface involving a turn or turns, the surface should be a complex surface containing the horizontal normals to its centre line and the slope of the centre line should be the same as that for a straight approach surface (see Figure E-3).

~~(5) In the case of an approach surface involving a turn, the surface should not contain more than one curved portion.~~

~~(6)~~(5) Where a curved portion of an approach surface is provided, the sum of the radius of the arc defining the centre line of the approach surface and the length of the straight portion originating at the inner edge should not be less than 575 m.

~~(7)~~(6) Any variation in the direction of the centre line of an approach surface should be designed so as not to necessitate a turn radius less than 270 m.

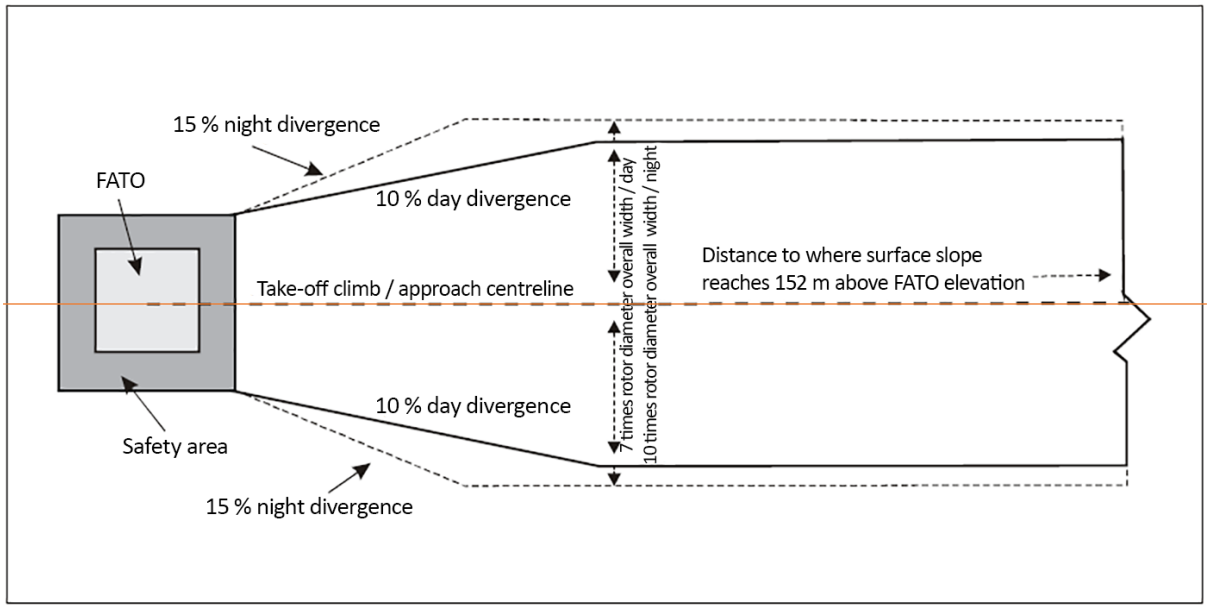


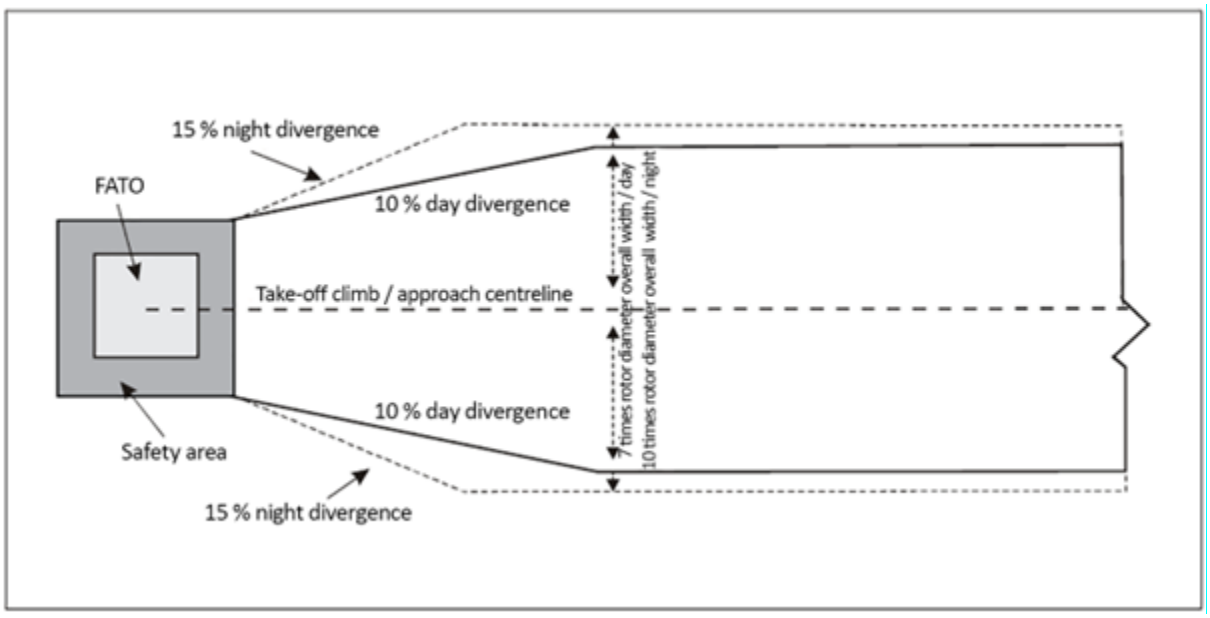
Note 1 - Dark grey shaded area requires the same characteristics as the safety area

Note 2 - Angle between take-off climb/ approaches surfaces from centreline to centreline depicted for illustration purposes only

Note 3 - Offset take-off climb/approach surface rotated around centre point of FATO

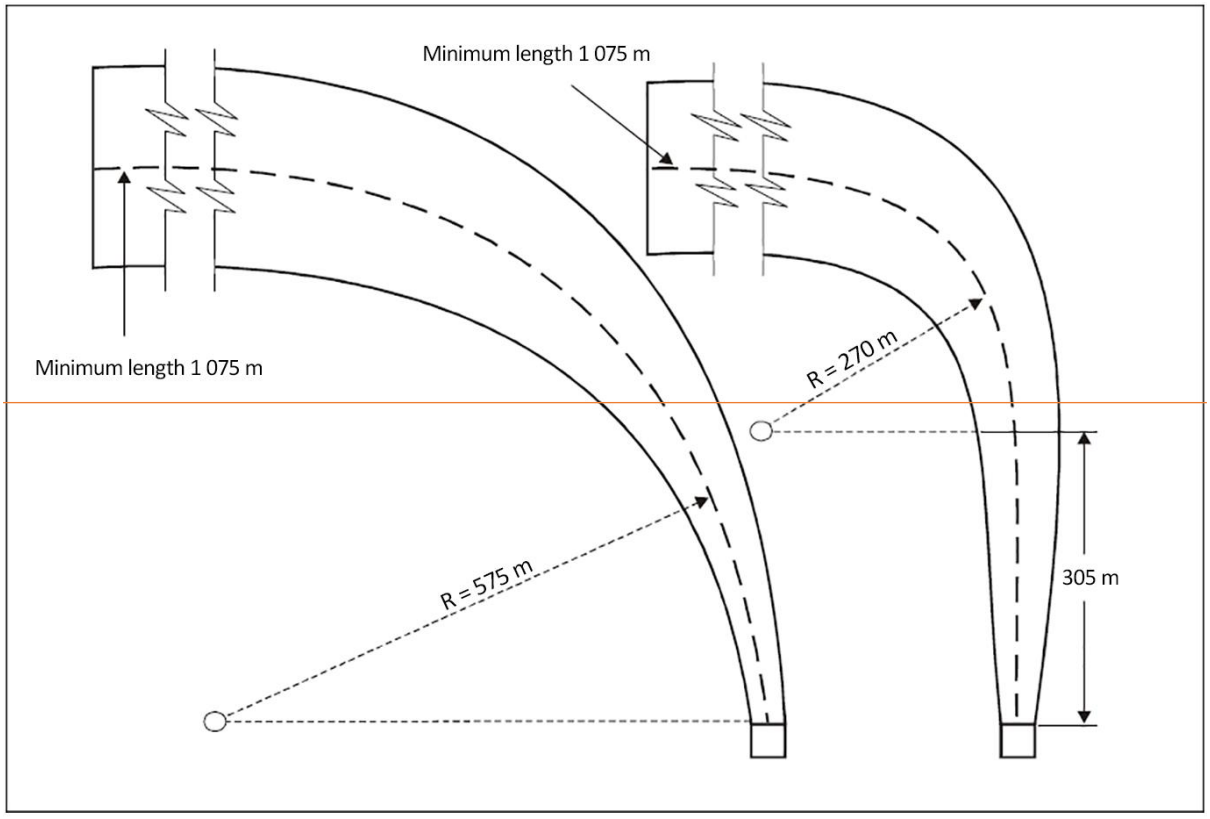
Figure E-1. Obstacle limitation surfaces — Take-off climb and approach surface





Note – The total length of the surface is equal to the distance specified in Table E-1.

Figure E-2. Take-off climb/approach surface width



~~Note 1 - Any combination of curve and straight portion may be established using the following formula: S+R ≥ 575 m and R ≥ 270 m where S = 305 m, where S is the length of the straight portion and R is the radius of turn. Note any combination ≥ 575 m will work.~~

~~Note 2 - The minimum length of the centre line of the curve and straight portion is 1 075 m but may be longer depending upon the slope used. See table E-1 for longer lengths.~~

~~Note 3 - Helicopter take-off performance is reduced in a curve and as such a straight portion along the take-off climb surface prior to the start of the curve should be considered to allow for acceleration.~~

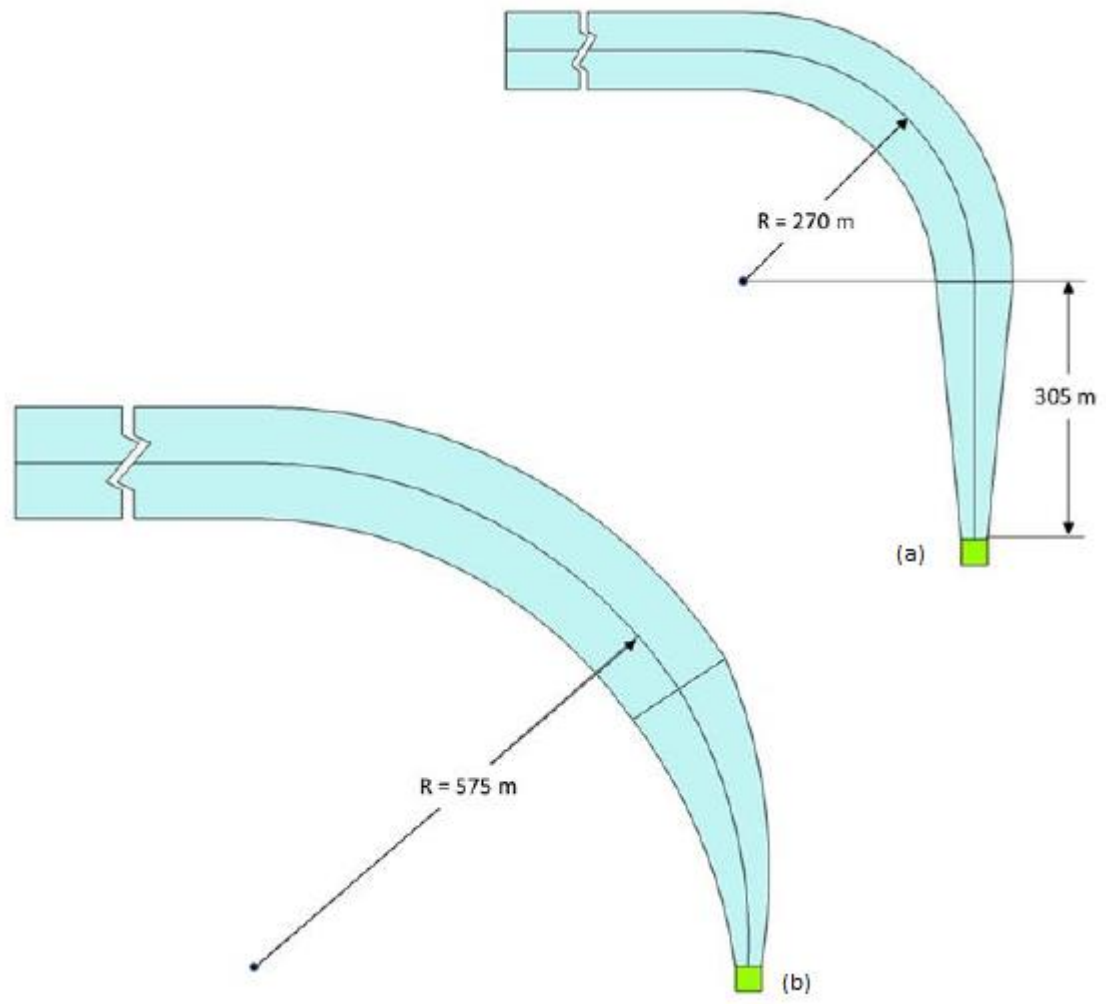


Figure E-3. Examples of c~~C~~urved approach and take-off climb surface ~~for all FATOs.~~ (a) Minimum allowed radius of 270 m; the minimum allowed length of the straight portion after the inner edge is 305 m. (b) No straight portion after the inner edge; a radius of 575 m is the minimum allowed.

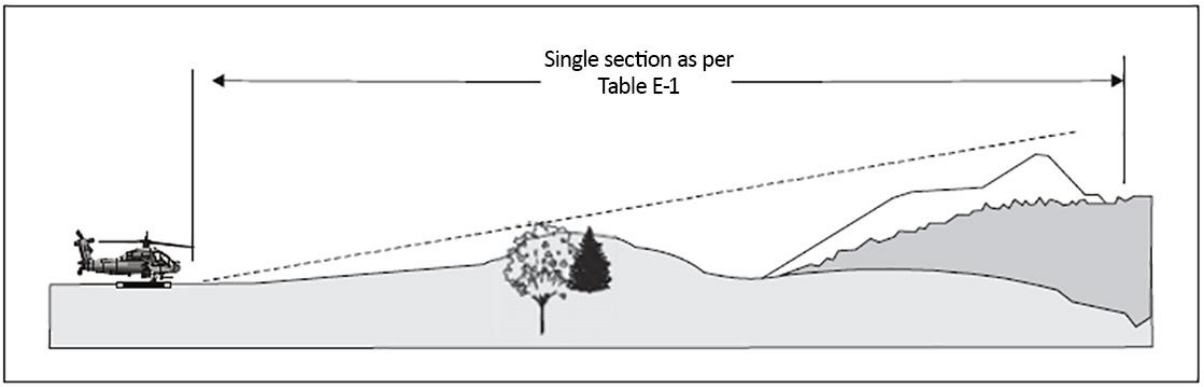
SURFACE AND DIMENSIONS	SLOPE DESIGN CATEGORIES		
	A	B	C
APPROACH AND TAKE-OFF CLIMB SURFACE:			
Length of inner edge	Width of safety area	Width of safety area	Width of safety area
Location of inner edge	Safety area boundary (Helicopter c~~C~~learway boundary if provided)	Safety area boundary	Safety area boundary
Divergence: (1st and 2nd section)			
Day use only	10 %	10 %	10 %

SURFACE AND DIMENSIONS	SLOPE DESIGN CATEGORIES		
	A	B	C
Night use	15 %	15 %	15 %
First section:			
Length	3 386 m	245 m	1 220 m
Slope	4.5 % (1:22.2)	8 % (1:12.5)	12.5 % (1:8)
Outer width	(b)	N/A	(b)
Second section:			
Length	N/A	830 m	N/A
Slope	N/A	16 % (1:6.25)	N/A
Outer width	N/A	(b)	N/A
Total length from inner edge (a)	3 386 m(c)	1 075 m(c)	1 220 m(c)
TRANSITIONAL SURFACE:			
Slope	50 % (1:2)	50 % (1:2)	50 % (1:2)
Height	45 m(d)	45 m(d)	45 m(d)

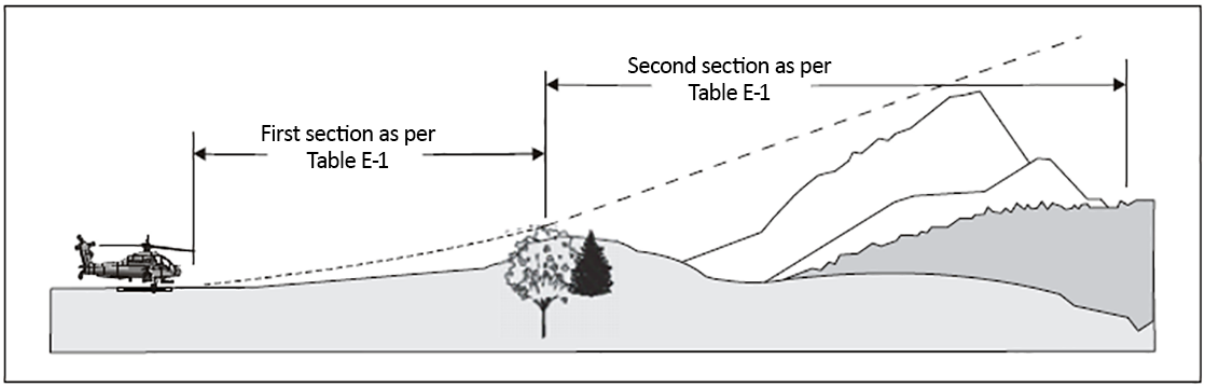
(a) The approach and take-off climb surface lengths of 3 386 m, 1 075 m and 1 220 m associated with the respective slopes, bring the helicopter to 152 m (500 ft) above FATO elevation.
(b) 7 rotor diameters overall width for day operations or 10 rotor diameters overall width for night operations.
(c) This length may be reduced if vertical procedures are in place or extended/reduced if the approach or take-off climb surface is extended/reduced to meet the OCS of the PinS procedure.
(d) See CS HPT-DSN.E.425(c)(1)(ii).

Note: The slope design categories depicted above represent minimum design slope angles and not operational slopes. Guidance on the application of slope categories is provided in GM1 HPT-DSN.E.420. ~~Slope category 'A' generally corresponds with helicopters operated in performance class 1; slope category 'B' generally corresponds with helicopters operated in performance class 3; and slope category 'C' generally corresponds with helicopters operated in performance class 2.~~

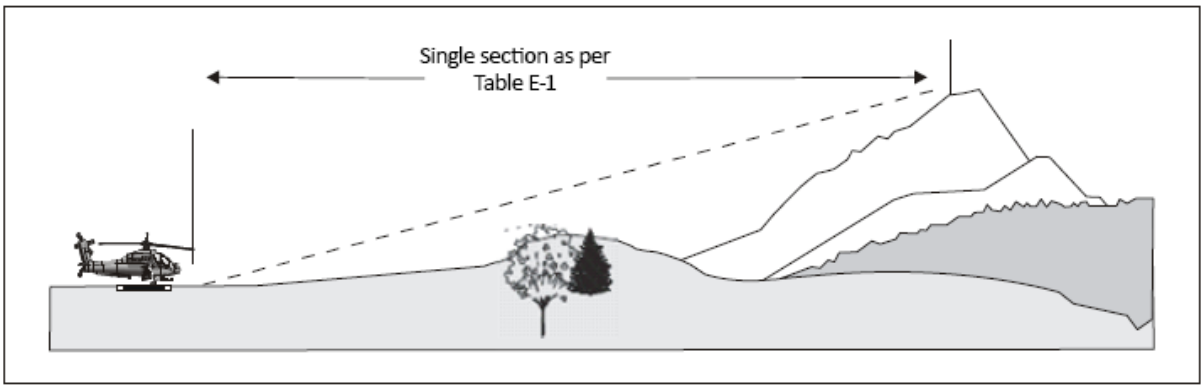
Table E-1. Dimensions and slopes of obstacle limitation surfaces for all visual FATOs



a) Approach and take-off climb surfaces – "A" slope profile – 4.5 % design



b) Approach and take-off climb surfaces – "B" slope profile – 8 % and 16 % design



c) Approach and take-off climb surfaces – "C" slope profile – 12.5 % design

Figure E-4. Approach and take-off climb surfaces with different slope design categories

Rationale

The proposed amendments of the CS are based on amendment 10 of Annex 14 Vol. II, and are as follows:

- *In points (b) and (c)(4) the addition of the possibility of more than one turn is proposed. According to ICAO, this was adopted to restore the practice of allowing more than one turn in*

the arrival and departure surfaces, which was removed, in error, in an earlier amendment to the SARPs. In relation to this, point (c)(5) is proposed to be deleted.

- *An improvement of the description the approach surface in point (b) is proposed which is currently achieved with reference to the end of the safety area, instead of the inner edge. The reference to the end of the safety area would be inaccurate in the case of vertical procedures.*
- *In point (c)(1)(i) an improvement of the description of the inner edge of the approach surface in combination with a reorganisation of the text is proposed.*
- *In proposed points (c)(1)(i)(B) and (c)(2)(ii), the position and elevation of the inner edge is defined in cases of vertical procedures. The introduction of these procedures facilitates the clearance obstacles and improves the usability of a heliport. The second sentence in current point (c)(2) is not required, and is proposed to be deleted.*
- *In proposed point (c)(1)(iii)(B) the elevation of the outer edge is provided where a PinS 'proceed visually' procedure is defined. To provide continuity between the OLS and the OCS in such a case, the outer edge of the approach surface should be extended/reduced to the point where the approach surface meets the PinS OCS. In addition, the term 'specified' in current point (c)(1)(iii) is proposed to be deleted.*
- *Figure E-2 is deleted in Annex 14 Vol. II with amendment 10. However, it is proposed to be maintained in the CS-HPT-DSN and be modified, by deleting the reference to the distance where the surface reaches the height of 152 m above FATO elevation. With the introduction of vertical procedures and the requirements linked to PinS approach or departure procedures with a proceed visually instruction, this height is no longer required in all cases. A note is proposed to be added under the Figure, which references the new applicable requirements.*
- *Figure E-3 is deleted in Annex 14 Vol. II with amendment 10. However, it is proposed to be maintained in the CS-HPT-DSN and be modified, so that the minimum length requirements are not indicated. This is due to the fact that with the proposed amendments, the length of the approach surface can be reduced below the indicated values in cases (if vertical procedures are in place) or extended/reduced (if the approach or take-off climb surface is extended/reduced to meet the OCS of the PinS approach or departure procedure). Furthermore, the caption of the Figure is proposed to be modified, to provide a description of the illustrated surfaces.*
- *Table E-1 is proposed to be amended as follows:*
    - *The term 'clearway' to be replaced by the 'helicopter clearway'.*
    - *Rows for the transitional surface to be added (see below in CS HPT-DSN.E.425).*
    - *Two new footnotes to be added: one in relation to the total length of the take-off/approach surface, in the case of vertical procedures and/or PinS procedures with a proceed visually instruction, and a second one in relation to the different requirements for the height of the transitional surface in case of vertical procedures.*
    - *The note to be modified so that it references GM1 HPT-DSN.E.420, where a description of the three slope design categories is provided.*

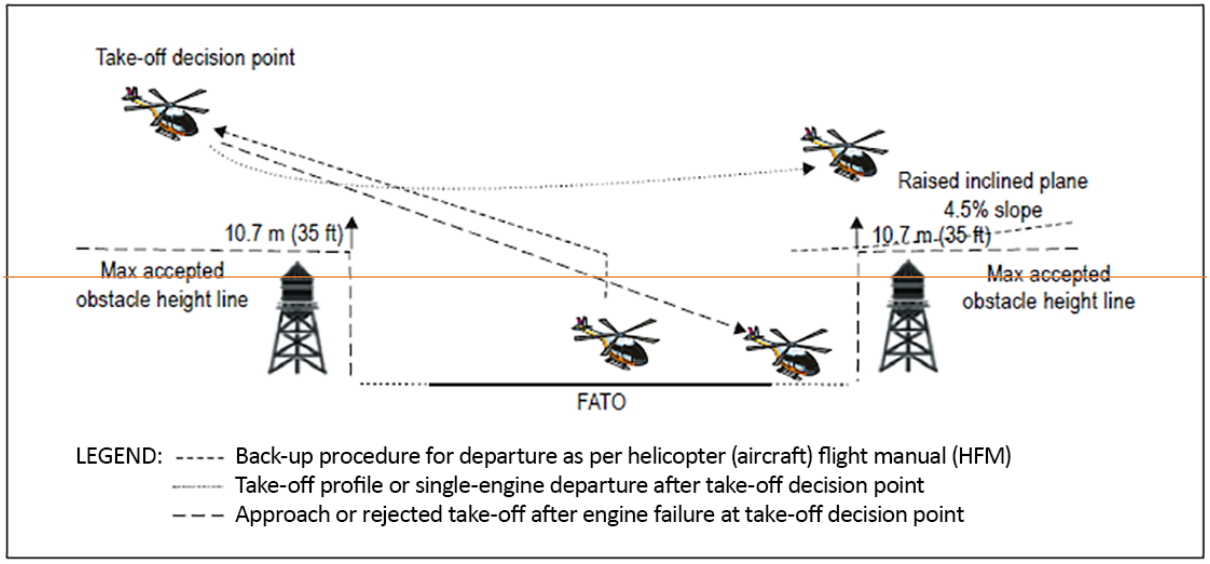
Apart from the proposed amendments that are based on the amendments of Annex 14, Vol. II, the following amendments are also proposed:

- *An editorial amendment in (c)(1)(iii).*

- *A renumbering of current points (c)(6) and (c)(7) due to the proposed deletion of point (c)(5).*

GM1 HPT-DSN.E.410 Approach surface

(a) Consultations with helicopter operators could assist the aerodrome operator in determining the appropriate slope category to apply according to the heliport environment and the most critical helicopter type for which the heliport is intended.



~~*Figure GM1-E-1. Example of raised inclined plane during operations in performance class 1*~~

~~(b) The example shown in Figure GM1-E-1 does not represent any specific profile, technique or helicopter type and is intended to show a generic example. An approach profile and a back-up procedure for departure profile are depicted. Specific manufacturers operations in performance class 1 may be represented differently in the specific helicopter (aircraft) flight manual (HFM).~~

~~(c) The approach/landing profile may not be the reverse of the take-off profile.~~

~~(d) Additional safety assessment for obstacles might be required in the area that a back-up procedure is intended. Helicopter performance and the HFM limitations would determine the extent of the assessment required.~~

~~(e)~~(b) For heliports intended to be used by helicopters operated in performance class 2 and 3, it is good practice for the approach paths to be selected so as to permit safe forced landing or one-engine-inoperative landings such that, as a minimum requirement, injury to persons on the ground or water or damage to property are minimised. The most critical helicopter type for which the heliport is intended and the ambient conditions may be factors in determining the suitability of such areas.

~~(f) The approach and take-off surfaces should be offset from each other ideally by an angle of not less than 135 degrees.~~

(c) For further depictions of approach surfaces, including cases of PinS approach procedures, and for guidance on construction of turns in approach surfaces see the Heliport Manual (Doc 9261).

Rationale

Points (b) and (d), and Figure GM1-E-1 are proposed to be deleted, because they are related to take-offs.

In addition, point (c) is also proposed for deletion, since it can be considered superfluous: The description of the approach surface in CS HPT-DSN.E.410 and of the take-off climb surface in CS HPT-DSN.E.420 make it clear that there are differences between the two kinds of surfaces.

Moreover, point (f) is proposed for deletion; see the rationale for CS HPT-DSN.E.430.

A new point (c) is proposed to be added. It contains a reference to the Heliport Manual, regarding further depictions and guidance for the design of approach surfaces.

CS HPT-DSN.E.420 Take-off climb surface

(a) Applicability: The purpose of the take-off climb surface is to protect a helicopter on take-off and during climb-out.

(b) Description: An inclined plane, a combination of planes or, when a turn ~~is~~or turns are involved, a complex surface sloping upwards from the end of the safety area, or of the helicopter clearway, when provided, and centred on a line passing through the centre of the FATO (see Figures E-1, E-2, E-3, and E-4, and Table E-1).

(c) Characteristics:

(1) The limits of a take-off climb surface should comprise:

(i) an inner edge, horizontal and perpendicular to the centre line of the take-off climb surface, with a~~equal in length to the~~ minimum ~~specified~~ width equal to the width/diameter of:

(A) when located at the outer edge of the safety area or helicopter clearway, the FATO plus the safety area~~perpendicular to the centre line of the take-off climb surface and located at the outer edge of the safety area~~; or

(B) when located at the outer edge of the elevated helicopter clearway, the elevated helicopter clearway.

(ii) two side edges originating at the ends of the inner edge and diverging uniformly at a specified rate from the vertical plane containing the centre line of the FATO; and

(iii) an outer edge horizontal and perpendicular to the centre line of the take-off climb surface ~~and~~ at:

(A) a ~~specified~~ height of 152 m (500 ft) above the elevation of the FATO~~.~~; or

(B) when a PinS departure procedure with proceed visually instruction is defined, a specified height above the elevation of the FATO.

(2) The elevation of the inner edge should be:

(i) the elevation of the FATO at the point on the inner edge that is intersected by the centre line of the take-off climb surface; or~~. For heliports intended to be used by helicopters operated in performance class 1, the inclined plane may be raised directly above the FATO.~~

(ii) when located at the outer edge of the helicopter clearway, the elevation of the helicopter clearway.

~~(3) Where a clearway is provided the elevation of the inner edge of the take-off climb surface should be located at the outer edge of the clearway at the highest point on the ground based on the centre line of the clearway.~~

(3)~~(4)~~ In the case of a straight take-off climb surface, the slope should be measured in the vertical plane containing the centre line of the surface.

(4)~~(5)~~ In the case of a take-off climb surface involving a turn or turns, the surface should be a complex surface containing the horizontal normals to its centre line and the slope of the centre line should be the same as that for a straight take-off climb surface (see Figure E-3).

~~(6) In the case of a take-off climb surface involving a turn, the surface should not contain more than one curved portion.~~

(5)~~(7)~~ Where a curved portion of a take-off climb surface, that does not have its inner edge at the outer edge of a clearway, is provided, the sum of the radius of the arc defining the centre line of the take-off climb surface and the length of the straight portion originating at the inner edge should not be less than 575 m.

(6)~~(8)~~ Any variation in the direction of the centre line of a take-off climb surface should be designed so as not to necessitate a turn of radius less than 270 m.

Rationale

The proposed amendments of the CS are based on amendment 10 of Annex 14 Vol. II, and are as follows:

- *In current points (b) and (c)(5) the addition of the possibility of more than one turn is proposed. According to ICAO, this was adopted to restore the practice of allowing more than one turn in the arrival and departure surfaces, which was removed, in error, in an earlier amendment to the SARPs. In relation to this, point (c)(6) is proposed to be deleted.*
- *An improvement of the description the take-off climb surface in point (b) is proposed, by adding the end of the helicopter clearway, where it is provided, as the start of the take-off climb surface.*
- *In point (c)(1)(i) an improvement of the description of the inner edge of the take-off climb surface is proposed, in combination with a reorganisation of the text.*
- *In proposed points (c)(1)(i)(B) and (c)(2)(ii), the position and elevation of the inner edge is defined in cases of an elevated clearway. The introduction of these procedures facilitates the clearance obstacles and improves the usability of a heliport. The second sentence in current point (c)(3) is not required, and is proposed to be deleted.*
- *In proposed point (c)(1)(iii)(B) the elevation of the outer edge is provided where a PinS 'proceed visually' procedure is defined. To provide continuity between the OLS and the OCS in such a case, the outer edge of the take-off climb surface should be extended/reduced to the point where the approach surface meets the PinS OCS. In addition, the term 'specified' in current point (c)(1)(iii) is proposed to be deleted.*

Apart from the proposed amendments that are based on the amendments of Annex 14, Vol. II, the following amendments are also proposed:

- *An editorial amendment in (c)(1)(iii).*
- *A renumbering of current points (c)(4), (c)(5), (c)(7) and (c)(8) due to the proposed deletion of points (c)(3) and (c)(5).*

GM1 HPT-DSN.E.420 Take-off climb surface

(a) Helicopter take-off performance is reduced in a turn~~curve~~, ~~so~~and as such a straight portion along the take-off climb surface prior to the start of the curve allows for acceleration.

[…]

(c) ~~The approach and take-off surfaces should be offset from each other ideally by an angle of not less than 135 degrees.~~Slope category 'A' generally corresponds with helicopters operated in performance class 1 and characterizes the limited performance that is available with one engine inoperative. Slope category 'B' corresponds with helicopters operated AEO (all-engines-operating). The first section slope permits acceleration to the best rate-of-climb speed whilst remaining outside the avoid area of the height velocity diagram after which the second section slope is applied. Slope category 'C' corresponds with helicopters operated AEO and characterizes a helicopter with sufficient performance to permit both acceleration and climb at the required slope.

(d) For further depictions of take-off climb surfaces including cases of PinS departure procedures, and for guidance on construction of turns in take-off climb surfaces see the Heliport Manual (Doc 9261).

Rationale

The proposed changes in point (a) are editorial and align the GM text with that of the Annex 14, Vol. II.

Moreover, current point (c) is proposed for deletion; see the rationale for CS HPT-DSN.E.430.

In its place, it is proposed to insert the description of the slope design categories, that is currently included as a note in Table E-1. The text that is proposed here is taken, however, from the Heliport Manual, and offers more insight into the differences of the three slope design categories. This is in line with the Annex 14, Vol. II, which – with amendment 10 – also contains a reference to the Heliport Manual.

Finally, in proposed point (d) a reference to the Heliport Manual is included, where more examples (and illustrations) of take-off climb surfaces can be found.

CS HPT-DSN.E.425 Transitional surface

(a) Applicability: The purpose of the transitional surface is to provide protection against obstacles to a helicopter which becomes displaced from the centre line while executing a PinS approach/departure procedure with proceed visually instruction.

(b) Description: A complex surface along the side of the safety area and helicopter clearway, when provided, and part of the side of the approach or take-off climb surface, that slopes upwards and outwards to a predetermined height (see Figure E-5 and Table E-1).

(c) Characteristics:

(1) The limits of a transitional surface should comprise:

(i) a lower edge beginning at a point on the side of the approach or take-off climb surface at a specified height extending down the side of the approach or take-off climb surface to the inner edge and from there along the length of the side of the helicopter clearway, when provided, and safety area, parallel to the centre line of the FATO; and

(ii) an upper edge located at:

(A) 45 m (150 ft) above the FATO; or

(B) when vertical procedures are being utilized, 15 m (50 ft) above the elevation of the upper edge of the ascent/descent surface.

(2) The elevation of a point on the lower edge should be:

(i) along the side of the approach or take-off climb surface — equal to the elevation of the approach or take-off climb surface at that point; then

(ii) if provided, along the helicopter clearway – equal to the elevation of the helicopter clearway; and

(iii) along the safety area — equal to the elevation of the FATO.

(3) The slope of the transitional surface should be measured in a vertical plane at right angles to the centre line of the FATO.

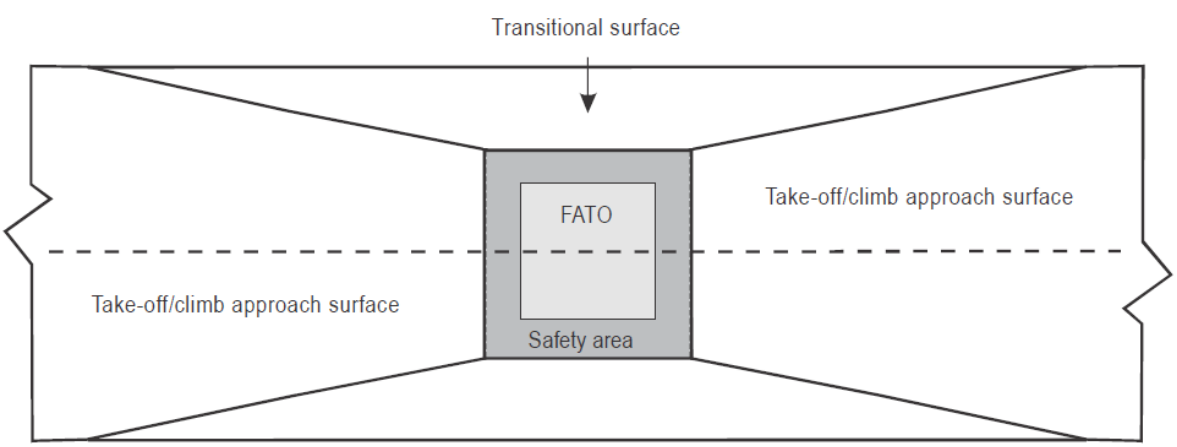


Figure E-5. Example of transitional surfaces for a square FATO with two opposing approach and take-off climb surfaces

Rationale

The proposed extension of the applicability of the CS-HPT-DSN to heliports, that utilise PinS approach or departure procedures with proceed visually instruction, requires the introduction of the transitional surface. The text, that is proposed to be added, is taken from Annex 14, Vol. II (up to and including amendment 10). The text of point (a)(1) is taken from the Heliport Manual.

It should be mentioned that, although the Figure in Annex 14 Vol. II corresponding to the proposed Figure E-5 is deleted with amendment 10, it is included here, so that at least a basic depiction of the transitional surface is included in the CS-HPT-DSN.

GM1 HPT-DSN.E.425 Transitional surface

Further depictions of transitional surfaces are included in the Heliport Manual.

Rationale

The Heliport Manual provides depictions of transitional surfaces for several arrangements of take-off and approach surfaces.

CS HPT-DSN.E.430 Obstacle limitation requirements

(a) General: The following obstacle limitation surfaces should be established for a FATO:

(1) take-off climb surface; ~~and~~

(2) approach surface; and

(3) transitional surfaces, at heliports with a PinS approach or departure procedure with a proceed visually instruction.

(b) Characteristics:

[…]

(2) ~~Where a heliport visual approach slope indicator is installed, additional obstacle protection surfaces should be provided, as specified in CS HPT-DSN.F.660, which can be more demanding than the obstacle limitation surfaces prescribed in Table E-1.~~Additional surfaces, which should be considered and can be more demanding than the obstacle limitation surfaces, include the following:

(i) the protected side slopes, as specified in CS HPT-DSN.B.140;

(ii) where a visual approach slope indicator is installed, the obstacle protection surface, as specified in CS HPT-DSN.F.660;

(iii) where PinS approach or departure procedures have been established, the corresponding PANS-OPS surfaces; and

(iv) where back-up or sideways procedures are used, the back-up or sideways area.

(3) Except f~~F~~or heliports facilitating performance class 1 operations, that have an approach/take-off climb surface with a 4.5 per cent slope design, objects can be permitted to penetrate the obstacle limitation surface, if after a safety assessment, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of helicopters.

(4) New objects or extensions of existing objects should not be permitted above ~~the approach or take-off climb surfaces~~any of the surfaces in (a), except when shielded by an

existing immovable object ~~or when after a safety assessment, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of helicopters~~.

(5) Existing objects above ~~the approach and take-off climb surfaces~~ any of the surfaces in (a), should, as far as practicable, be removed except when the object is shielded by an existing immovable object ~~or when after a safety assessment, it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of helicopters~~.

(6) A heliport should have at least two approach and take-off climb surfaces, separated by not less than 135°. ~~When only a single approach and take-off climb surface is provided, a safety assessment should be undertaken considering as a minimum, the following factors:~~

~~(i) the area/terrain over which the flight is being conducted;~~

~~(ii) the obstacle environment surrounding the heliport;~~

~~(iii) the performance and operating limitations of helicopters intending to use the heliport; and~~

~~(iv) the local meteorological conditions including the prevailing winds.~~

Rationale

The amendments proposed, apart from the one regarding point (b)(2), are based on amendment 10 of Annex 14, Vol. II. In particular:

- *The transitional surface is included in the surfaces to be protected, where PinS procedures with proceed visually instruction are employed.*
- *Heliports facilitating performance class 1 operations and have an approach or take-off climb surface of 4.5 % slope are excluded from the possibility to have objects penetrating the OLS based on a safety assessment.*
- *New objects and extensions of existing objects can be permitted above the OLS only based on the shielding principle. Such obstacles are not allowed to be developed in any other case.*
- *Existing objects penetrating the OLS should in general be removed. The only exception is based on the shielding principle and no other safety assessment should be accepted.*
- *The requirements on the safety assessment that should be carried out, when a single approach and take-off climb surface is provided, are deleted. With amendment 10 of Annex 14 Vol. II, the requirement for at least two approach and take-off climb surfaces has been adopted by ICAO as a recommended practice.*

The new provisions increase the level of safety, while maintaining the usability of a helicopter for the case of PC1 operations and 4.5% slope of the approach and take-off climb surfaces. The introduction of the vertical procedures makes it possible to avoid the situation where objects penetrate the OLS and, therefore, a safety assessment should not be required to accept such obstacles. Furthermore, the deletion of the possibility for a safety assessment will align the heliport obstacle limitation requirements with their equivalent in the CS ADR-DSN.J.470(c), 475(d), 480(f) and 485(d). Moreover, according to ICAO, the adoption of the requirement for (at least) two approach / take-off climb surfaces will lift the misunderstanding that a single approach and take-off climb surface is the norm. The value

of 135° is a standard accepted by many countries and is already included in the EASA regulatory material as guidance.

Finally, point (b)(2) is proposed to be extended so as to include further surfaces, that should be taken into account, if applicable, and could introduce more stringent requirements for obstacle limitation.

GM1 HPT-DSN.E.430 Obstacle limitation requirements

~~Intentionally left blank~~

(a) The requirements for obstacle limitation surfaces are specified on the basis of the intended use of a FATO, i.e. approach manoeuvre to hover or landing, or take-off manoeuvre and type of approach, and are intended to be applied when such use is made of the FATO. In cases where operations are conducted to or from both directions of a FATO, then the function of certain surfaces may be nullified because of more stringent requirements of another lower surface.

(b) The application of curved approach or take-off climb surfaces and/or the utilization of vertical procedures may alleviate the problems created by objects infringing these surfaces. However, additional obstacle assessment might be required in other cases, e.g. in the area that a back-up procedure is intended. The helicopter performance and the HFM limitations will determine the extent of the assessment required.

(c) The Procedures for Air Navigation Services — Aircraft Operations, (PANS-OPS, Doc 8168), Volume II, Part IV details the design criteria of the PinS procedure.

Rationale

The text of the GM is taken from notes that are included in Annex 14, Vol. II, except for the last two sentences of point (b), which are transferred here from point (d) of GM1 HPT-DSN.E.410.

It is considered that their inclusion will be helpful to the heliport operator.

CHAPTER F — VISUAL AIDS

[…]

GM1 HPT-DSN.F.500 General

(a) When a runway is marked in accordance with the provisions of CS-ADR-DSN, and is utilised as a FATO, no additional runway markings or lighting are required for helicopter use.

(b) See GM1 ADR-DSN.L.520 concerning the improvement of the conspicuity of markings.

Rationale

A new GM is proposed to be added as a guidance for the aerodrome designer to be used in cases where there is insufficient contrast between the marking and the pavement surface.

CS HPT-DSN.F.510 Wind direction indicators

~~Applicability: A heliport should be equipped with at least one wind direction indicator.~~

(a) Applicability: If the wind direction indicators serving the aerodrome do not clearly indicate the correct wind information at the heliport, additional wind direction indicators should be installed in order to provide wind information to the pilot during approach and take-off.

(b) Location:

(1) A wind direction indicator should be located so as to indicate the wind conditions over the FATO and TLOF and in such a way as to be free from the effects of airflow disturbances caused by nearby objects or rotor downwash. It should be visible from a helicopter in flight, in a hover or on the movement area.

(2) Where a TLOF and/or FATO are subject to a disturbed airflow, additional wind direction indicators located close to the area should be provided to indicate the surface wind on the area.

(c) Characteristics:

(1) A wind direction indicator should give a clear indication of the direction of the wind and a general indication of the wind speed.

(2) A wind direction indicator for the heliport should be a truncated cone made of lightweight fabric and should have the following minimum dimensions:

(i) Length 2.4 m,

(ii) Diameter (larger end) 0.6 m, and

(iii) Diameter (smaller end) 0.3 m.

(3) The colour of the wind direction indicator should be so selected as to make it clearly visible and understandable from a height of at least 200 m (650 ft) above the heliport, having regard to the background:

(i) where practicable, a single colour, preferably white or orange, should be used;

(ii) where a combination of two colours is required to give adequate conspicuity against changing backgrounds, they should preferably be orange and white, red and white, or black and white, and should be arranged in five alternate bands, the first and last band being the darker colour.

(d) A wind direction indicator at a heliport intended for use at night should be illuminated.

Rationale

In Annex 14 Vol. II. provisions on WDI are at the level of standards and recommended practices. Therefore, it is proposed to transfer the text of the GM1 HPT-DSN.F.510 to the CS in order to ensure coherence with Annex 14 Vol. II. Furthermore, since the provision of accurate wind information is a safety-related issue, the WDI-related regulatory material should not be at the level of guidance material.

The use of the larger WDI satisfying CS ADR-DSN.K.490 is acceptable, since the dimensions of the WDI for heliports are minimum dimensions and the colouring characteristics are identical.

The applicability provision describes the conditions under which the CS should be applied.

GM1 HPT-DSN.F.510 Wind direction indicators

~~(a) General: If the wind direction indicators serving the aerodrome do not clearly indicate the correct wind information at the heliport, additional wind direction indicators should be installed in order to provide wind information to the pilot during approach and take-off.~~

~~(b) Location:~~

~~(1) A wind direction indicator should be located so as to indicate the wind conditions over the FATO and TLOF and in such a way as to be free from the effects of airflow disturbances caused by nearby objects or rotor downwash. It should be visible from a helicopter in flight, in a hover or on the movement area.~~

~~(2) Where a TLOF and/or FATO are subject to a disturbed airflow, additional wind direction indicators located close to the area should be provided to indicate the surface wind on the area.~~

~~(c) Characteristics:~~

~~(1) A wind direction indicator should give a clear indication of the direction of the wind and a general indication of the wind speed.~~

~~(2) A wind direction indicator for the heliport should be a truncated cone made of lightweight fabric and should have the following minimum dimensions:~~

~~(i) Length 2.4 m,~~

~~(ii) Diameter (larger end) 0.6 m, and~~

~~(iii) Diameter (smaller end) 0.3 m.~~

~~(3) The colour of the wind direction indicator should be so selected as to make it clearly visible and understandable from a height of at least 200 m (650 ft) above the heliport, having regard to the background:~~

~~(i) where practicable, a single colour, preferably white or orange, should be used;~~

~~(ii) where a combination of two colours is required to give adequate conspicuity against changing backgrounds, they should preferably be orange and white, red and white, or black and white, and should be arranged in five alternate bands, the first and last band being the darker colour.~~

~~(d) A wind direction indicator at a heliport intended for use at night should be illuminated.~~

Intentionally left blank

Rationale

See the rationale of the corresponding CS.

CS HPT-DSN.F.520 Heliport identification marking

(a) The objective of a heliport identification marking is to provide to the pilot an indication of the presence of a heliport by its form, its likely usage and the preferred direction(s) of approach. The latter corresponds to the median of the arrival surface(s).

[…]

Rationale

It is proposed to add the objective of the heliport identification marking in combination with what is meant with the term 'preferred direction of approach'. Due to this addition the rest of the points are renumbered.

GM1 HPT-DSN.F.520 Heliport identification marking

(a) If the touchdown/positioning marking is offset, the heliport identification marking is established in the centre of the touchdown/positioning marking.

(b) On a FATO which is not a runway-type FATO, does not contain a TLOF and ~~which~~ is marked with an aiming point marking (see CS HPT-DSN.F.550), the heliport identification marking should be established in the centre of the aiming point marking as shown in Figure F-1.

Rationale

A guidance is proposed to be added regarding the position of the heliport identification marking in the cases where the TDPM is offset. This is contained as a Note in Annex 14 Vol. II.

Moreover, a clarification is proposed to be added to the single provision of the current GM, namely that the GM is applicable to other than runway-type FATOs. This is not contained in Annex 14, Vol. II, but can be deduced by the fact that the heliport identification marking cannot have the required dimensions (height of 9 m), if it is established in the centre of the aiming point marking. This is supported also by the provisions of the Heliport Manual, where it is mentioned that the aiming point for a runway-type FATO should be located 'at the termination point of the intended approach'.

CS HPT-DSN.F.525 D-value marking

(a) The objective of D-value marking is to provide to the pilot the 'D' of the largest helicopter that can be accommodated on the heliport.

(b) Applicability: D-value markings should be provided at a heliport:

(1) for all FATOs except runway-type FATOs; and

(2) for all TLOFs not collocated with FATOs.

(c) Location:

(1) A D-value marking should be located within the TLOF or FATO and so arranged as to be readable from the preferred approach direction.

(2) Where there is more than one approach direction, additional D-value markings should be provided such that at least one D-value marking is readable from the approach direction.

(d) Characteristics:

(1) The D-value marking should be white.

(2) The D-value marking should be rounded to the nearest whole meter with 0.5 rounded down.

(3) The height of the numbers of the marking should be:

(i) for a D-value of less than 15 m, a minimum of 60 cm;

(ii) for a D-value between 15 m and 30 m, a minimum of 90 cm; and

(iii) for a D-value of more than 30 m, as shown in Figure F-4.

(4) For marking heights less than 150 cm (D-values of 30 m or less), the markings should be in the form shown in Figure F-4, with a proportional reduction in width and thickness.

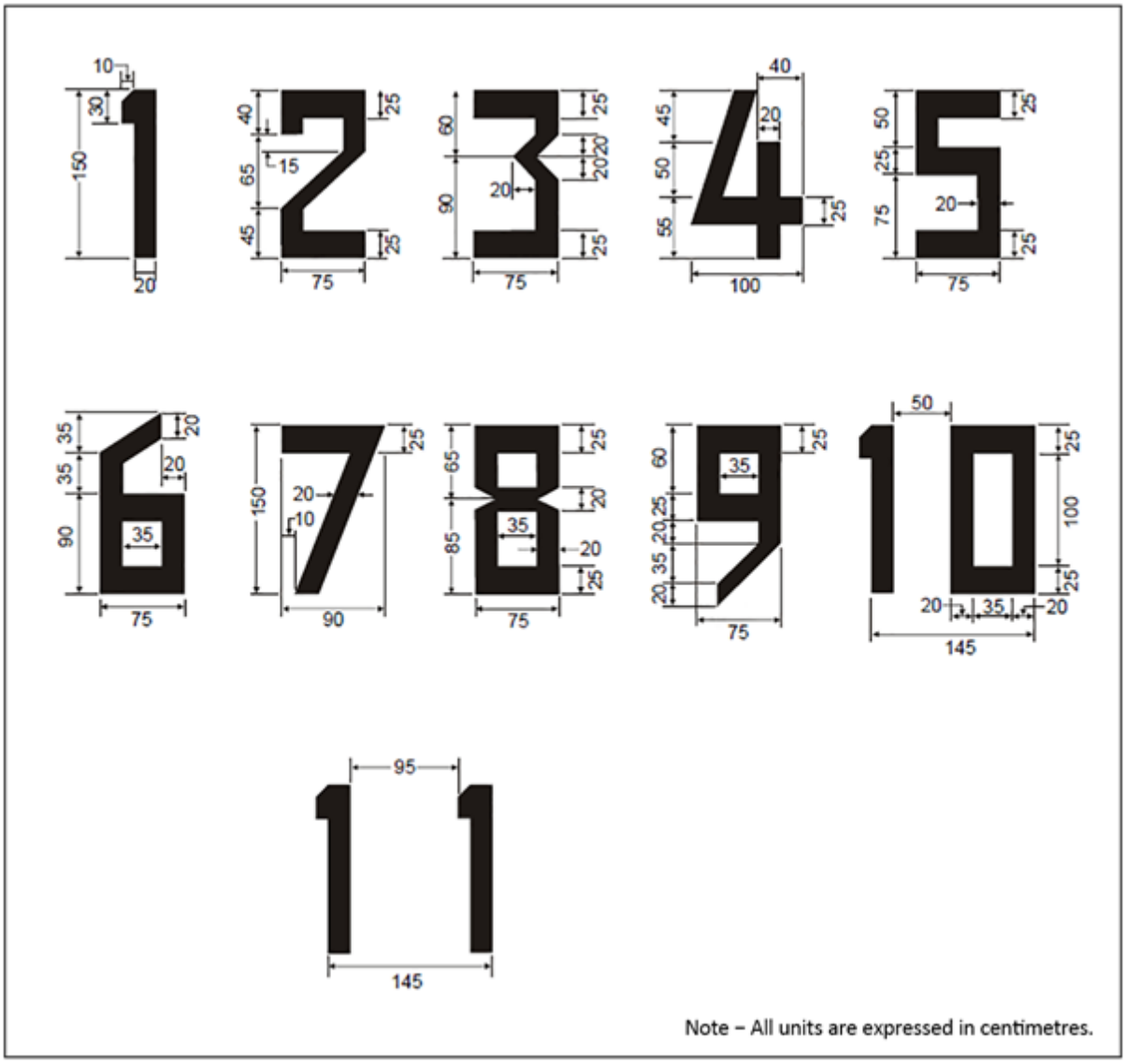


Figure F-4. Form and proportions of numbers

Rationale

With amendment 9 of Annex 14, Vol. II, the application of section 5.2.4 regarding D-value markings become a standard for surface-level heliports. As a result, it is proposed that a new CS is introduced with the content taken from the above-mentioned section. Figure GM1-F-2 has been transferred here as a new Figure F-4. This addition affects the numbers of all the following Figures.

GM1 HPT-DSN.F.525 D-value marking

Intentionally left blank

CS HPT-DSN.F.530 Final approach and take-off area perimeter marking or markers

(a) The objective of final approach and take-off area perimeter marking, or markers, is to provide to the pilot, where the perimeter of the FATO is not self-evident, an indication of the area that is free of obstacles and in which intended procedures, or permitted manoeuvring, may take place.

[…]

~~(c)~~(d) Characteristics:

(1) For runway-type FATOs:

[…]

(v) A FATO perimeter marker should have dimensional characteristics as shown in Figure F-5.

[…]

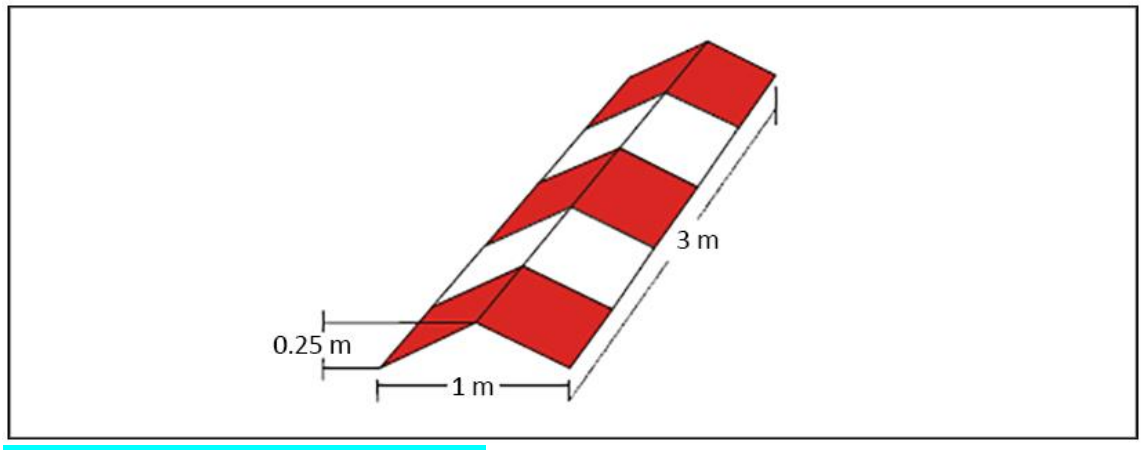


Figure F-5. Runway-type FATO perimeter marker

Rationale

It is proposed to add the objective of the final approach and take-off area perimeter marking, or markers based on the corresponding text in Annex 14 Vol. II. Due to this addition the rest of the points are renumbered.

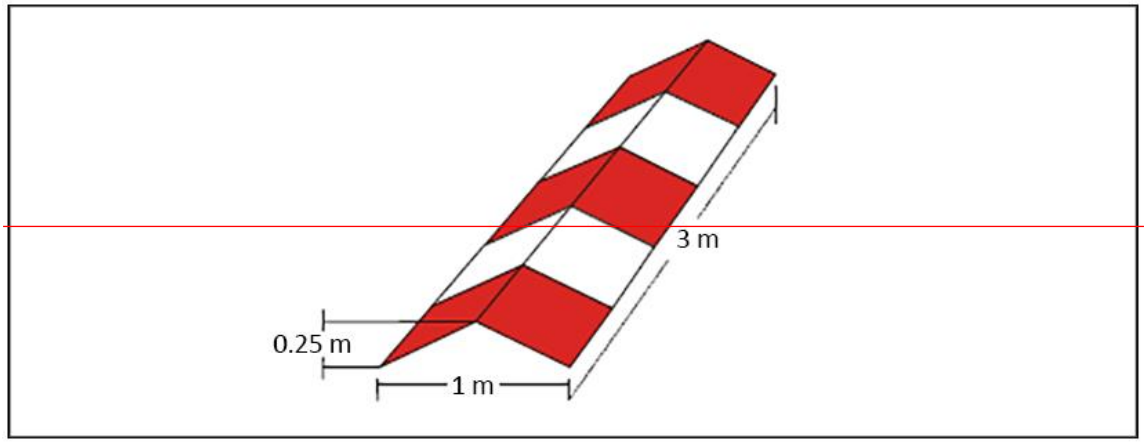
Furthermore, it is proposed to move the provision on the dimensional characteristics of the FATO perimeter markers from the GM to the CS, since the corresponding provision in Annex 14, Vol. II is at the level of a Standard.

In addition, the term 'edge' in the caption of current Figure GM1-F-1 is proposed to be replaced by the term 'perimeter' for consistency reasons.

GM1 HPT-DSN.F.530 Final approach and take-off area perimeter marking or markers

(a) Where a TLOF is coincident with a FATO, the TLOF marking can be used.

(b) FATO perimeter markers should be of a single colour, either orange or red, or the two contrasting colours of orange and white or, alternatively, red and white should be used except where such colours would merge with the background. ~~A FATO perimeter marker should have dimensional characteristics as shown in Figure GM1-F-1.~~



~~***Figure GM1-F-1. Runway-type FATO edge marker***~~

Rationale

Regarding the deletion of the provision on the dimensional characteristics of the FATO perimeter markers see the rationale of the corresponding CS.

CS HPT-DSN.F.540 Final approach and take-off area designation marking

(a) The objective of final approach and take-off area designation markings for runway-type FATOs is to provide to the pilot an indication of the magnetic heading of the runway.

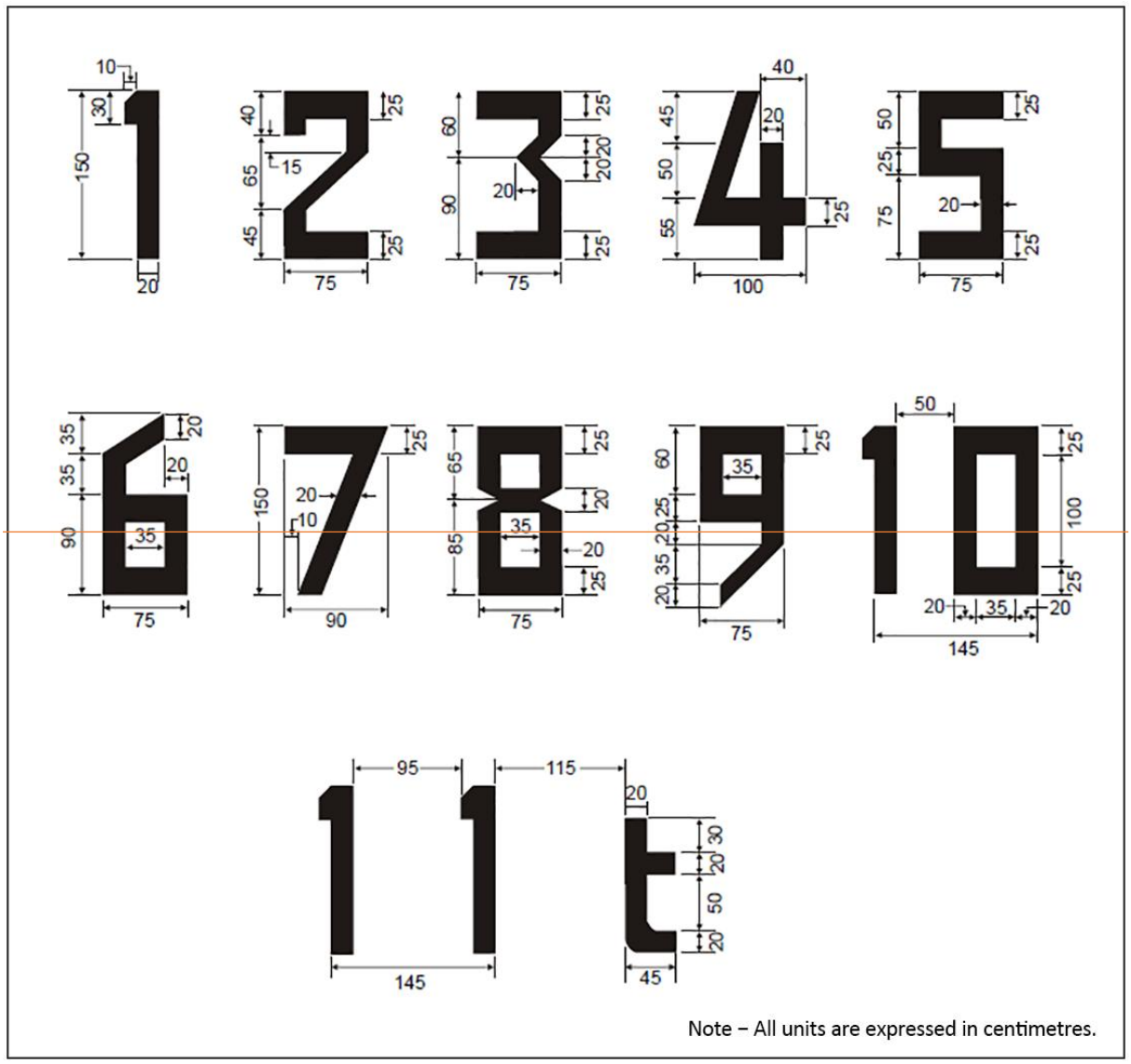
[…]

Rationale

The objective of the FATO designation marking is proposed to be added based on the corresponding text in Annex 14 Vol. II. Due to this addition the rest of the points are renumbered.

GM1 HPT-DSN.F.540 Final approach and take-off area designation marking

For a runway-type FATO, the numbers and the letter of the marking should have a white colour and should be in the form and proportion shown in Figure GM1-F-2.



~~***Figure GM1-F-2. Form and proportions of numbers and letter***~~

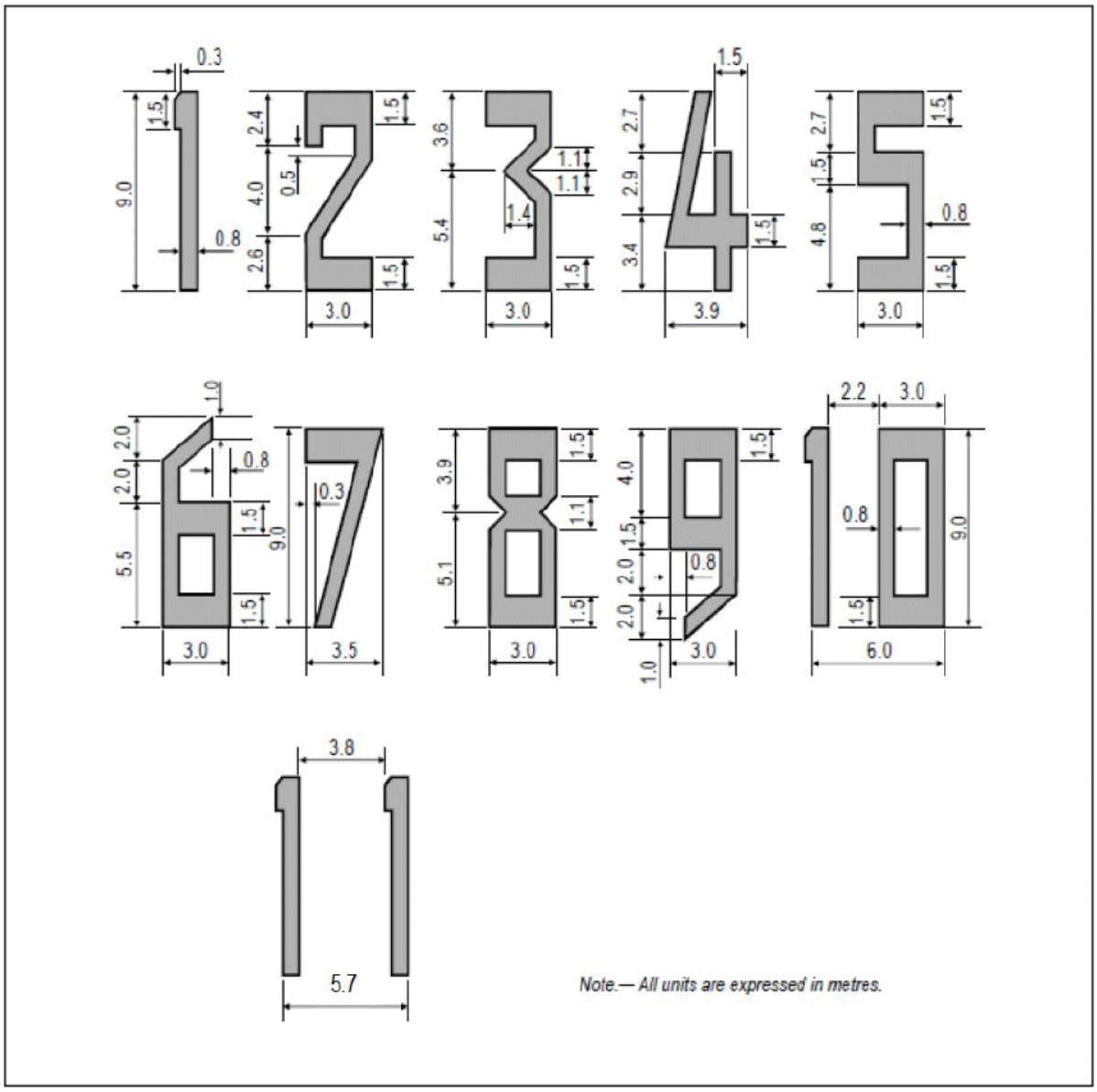


Figure GM1-F-2. Form and proportions of numbers of the FATO designation marking

Rationale

In Annex 14 Vol. II and in the Heliport Manual the figure corresponding to the current Figure GM1-F-2 is mentioned only in relation to the maximum allowable mass marking and the D-value marking. The FATO designation marking is not linked to any Figure, since the adoption of amendment 5 of Annex 14 Vol. II by ICAO.

In contrast, in the current version of CS-HPT-DSN, the use of the shapes and proportions of Figure GM1-F-2 is included as a guidance material in relation to the FATO designation marking.

However, it can be observed that the shape of the markings in GM1-F-2 is not elongated, implying that these numbers are designed to be optimally viewed at a high angle, i.e. close to and above the marking. This renders them unsuitable for the FATO designation marking at runway-type FATOs, which would normally involve helicopters approaching at a relatively low angle. The marking, that could be considered to be suitable, is the one contained in CS ADR-DSN.L.525 for the runway designation

marking. Indeed, the numbers are elongated and based on their height and space between the characters, they correspond perfectly with the marking illustrated in Figure F-2.

However, this was the figure that was removed from Annex 14, Vol. II with amendment 5. State letter 13/21 – proposing this deletion – did not provide a rationale. Furthermore, it could be argued that the similarity of the markings could lead to misidentification of a FATO as a runway.

Based on the above, there are two options:

- *Option 1: Keep the shapes of the current Figure GM1-F-2 (proposed new Figure F-4) as the shapes to be used for the FATO designation marking.*
- *Option 2: Introduce Figure L-2 of CS ADR-DSN.L.525 as new Figure GM1-F-2 and use these shapes for the FATO designation marking.*

Question to stakeholders:

EASA is inviting the stakeholders to share their views on which of the two options should be chosen.

CS HPT-DSN.F.550 Aiming point marking

[…]

(b) Applicability: An aiming point marking should be provided at a heliport where it is necessary for a pilot to make an approach to a particular point above a FATO before proceeding to a TLOF.

(c)~~(b)~~ Location: Where provided, the aiming point marking should be located within the FATO (see Figure F-1 for other than runway-type FATOs).

(d)~~(c)~~ Characteristics:

(i) The aiming point marking should be an equilateral triangle with a minimum side length of 9.0 metres, with the bisector of one of the angles aligned with the preferred approach direction.

(ii) The marking should consist of continuous white lines, 1~~.0~~ m in width and 9 m in length (see Figures F-1 and F-1~~2~~3).

Rationale

It is proposed that the applicability is added, which is transferred without changes from Annex 14, Vol. II. Due to this addition the rest of the points are renumbered.

Furthermore, the reference to Figure F-1 is proposed to be complemented with a restriction that Figure F-1 applies only to FATOs that are not runway-type FATOs. See rationale for GM1 HPT-DSN.F.520.

Moreover, the length of the sides of the aiming point marking is mentioned only within current Figure F-12. It is proposed to be added explicitly in the text.

Finally, the amendment of the Figure number from F-12 to F-13 is based on the proposed addition of a new Figure F-4.

GM1 HPT-DSN.F.550 Aiming point marking

For all FATOs except runway-type FATOs, the aiming point marking should be located at the centre of the FATO, as shown in Figure F-1. For a runway-type FATO, the aiming point marking should be located at the termination point of the intended approach, except that, on a FATO equipped with a visual approach slope indicator system, the beginning of the marking should be coincident with the visual approach slope origin.

Rationale

The first part of the sentence, that was added, is based on the Heliport Manual, Part II, par. 5.2.6. The second part of the sentence is based on the equivalent text of CS ADR-DSN.L.540, that is applicable for the positioning of an aiming point marking on a runway. See also the rationale of GM1 HPT-DSN.F.520.

CS HPT-DSN.F.560 Touchdown and lift-off area perimeter marking

(a) ~~The safety objective of the touchdown and lift-off area perimeter marking is to provide to the pilot a clear indication of a TLOF.~~The objective of the touchdown and lift-off area perimeter marking is to provide to the pilot an indication of an area that is free of obstacles; has dynamic load bearing; and in which, when positioned in accordance with the TDPM, undercarriage containment is assured.

[…]

Rationale

It is proposed that the text of the safety objective is replaced by the text contained in Annex 14 Vol. II, since the latter is more detailed.

GM1 HPT-DSN.F.560 Touchdown and lift-off area perimeter marking

~~A TLOF perimeter marking should be provided on each TLOF collocated with a helicopter stand.~~

Intentionally left blank

Rationale

It is proposed to delete the current text of the GM. As stands will need a TDPM, there is no necessity for marking the TLOF perimeter.

CS HPT-DSN.F.570 Touchdown/positioning marking

(a) The objective of a touchdown/positioning marking (TDPM) is to provide visual cues which permit a helicopter to be placed in a specific position.

~~(a)~~(b) Applicability:

(1) A touchdown/positioning marking should be provided where it is necessary for a helicopter to touch down and/or be accurately placed in a specific position~~ed~~.

(2) ~~A touchdown/positioning marking should be provided on a helicopter stand designed for turning.~~The touchdown/positioning marking should be:

(i) when there is no limitation on the direction of touchdown/positioning, a touchdown/positioning circle (TDPC) marking (see Figure F-5(a)); and

(ii) when there is a limitation on the direction of touchdown/positioning:

(A) for unidirectional applications, a shoulder line with an associated centreline (see Figure F-5(b)); or

(B) for multidirectional applications, a TDPC marking with prohibited landing sector(s) marked (see Figure F-5(c)).

~~(b)~~(c) Location:

(1) A touchdown/positioning marking should be located so that when the pilot's seat is over the marking, the whole of the undercarriage should be within the TLOF and all parts of the helicopter should be clear of any obstacles by a safe margin.

(2) ~~On a heliport, the centre of the touchdown/positioning marking should be located at the centre of the TLOF, except the centre of the touchdown/positioning marking may be offset away from the centre of the TLOF where a safety assessment indicates such offsetting to be necessary, and providing that a marking that is so offset would not adversely affect safety.~~The inner edge/inner circumference of the touchdown/positioning marking should be at a distance of 0.25 D from the centre of the area in which the helicopter is to be positioned.

(3) ~~For a helicopter stand designed for hover turning, the touchdown/positioning marking should be located in the centre of the central zone (see Figure D-1).~~Prohibited landing sector markings, when provided, should be located on the TDPM, diametrically opposite from the area where the tail rotor should not be placed.

~~(c)~~(d) Characteristics:

(1) A touchdown/positioning marking should be ~~a~~ yellow ~~circle~~ and have a line width of at least 0.5 m.

(2) The inner diameter of the touchdown/positioning ~~marking~~circle should be 0.5 D of the largest helicopter the area~~TLOF and/or the helicopter stand~~ is intended to serve.

(3) The length of a shoulder line should be 0.5 D of the largest helicopter the area is intended to serve.

(4) The TDPM should take precedence when used in conjunction with other markings on the TLOF except for the prohibited landing sector marking.

(5) The prohibited landing sector marking, when provided, should:

(i) be indicated by white and red hatched markings as shown in Figure F-5(c); and

(ii) extend to the inner edge of the TLOF perimeter marking.

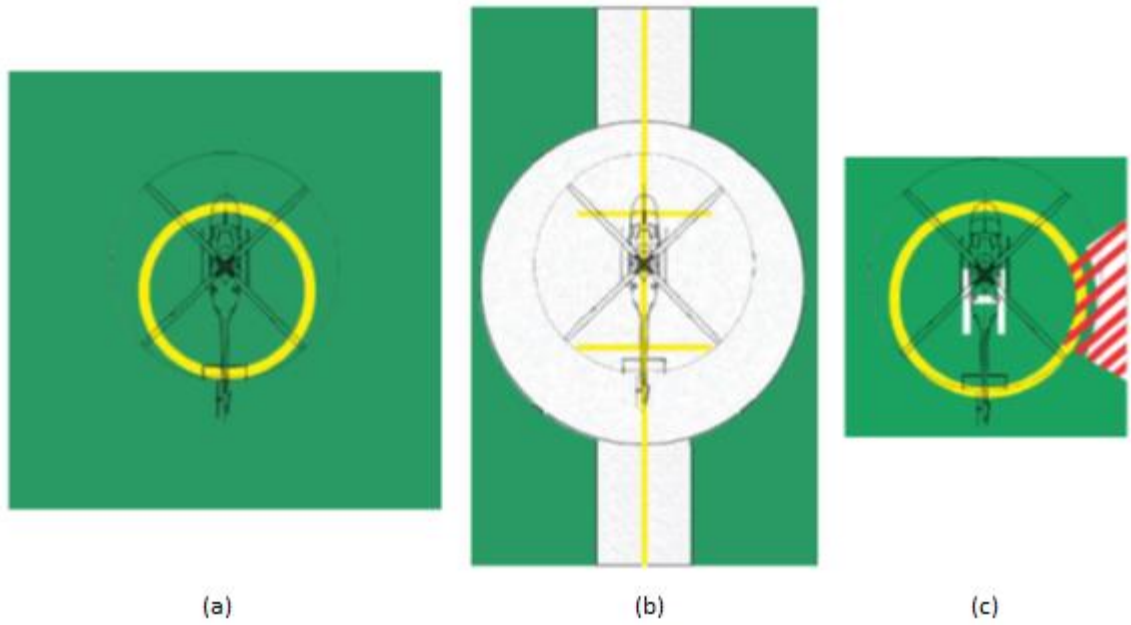


Figure F-5 Forms of touchdown/positioning markings: (a) Multidirectional TDPC with no limitations, (b) unidirectional marking shoulder line with associated centerline and (c) multidirectional TDPC with prohibited landing sector marking

Rationale

The objective of the TDPM is proposed to form new point (a) in line with other provisions in the CS-HPT-DSN. Due to this addition the rest of the points are renumbered.

Furthermore, the current CS is proposed to be amended in line with amendment 9 of Annex 14 Vol. II. The new structure of the CS reflects the proposed amendments in Chapter B and includes all forms of TDPMs (circle, centre line with stop line and circle with prohibited landing sector). The latter is proposed to be included in the CS, although it originates from the Annex 14 Vol. II provisions on helidecks, considering that such restricted areas might be necessary at surface-level heliports, too.

The provision mentioning the position of the centre of the TDPM and the possibility to offset it are proposed to be deleted, since these are already covered by the broader statement in point (c)(1) about the location of the marking. However, a new point (a) has been added in the corresponding GM, to maintain clarity. It should be mentioned that after amendment 5, Annex 14 Vol. II contains an explicit reference to the possibility of offsetting the TDPM only where it is in a FATO. In place of the above-mentioned provisions, a new provision is proposed to be added as point (c)(2) regarding the distance of the inner circumference or inner edge of the marking from its centre.

Point (c)(3) of the CS is proposed to be deleted, because the concept of the central zone has been removed from the CS-HPT-DSN (in line with Annex 14 Vol. II) and in addition, it has been judged that the TDPM might not offer sufficient guidance for the turning in hover. Based on the Heliport Manual, a new point (c) is proposed to be added in the corresponding GM in relation to this proposed deletion (see below). In place of the deleted provision, a new requirement regarding the location of the prohibited landing sector marking, where it is provided.

In point (d)(1) the term 'circle' is proposed to be deleted, and in (d)(2) the term 'marking' to be replaced by 'circle', since the TDPM does not include circles only, but also shoulder lines. The latter are described in the new proposed (d)(3).

Due to the importance of the TDPM, a new provision is proposed to be added as point (d)(4) in line with amendment 9 of Annex 14 Vol. II, based on which the TDPM takes precedence over all other markings apart from the prohibited landing sector ones.

In addition, the basic characteristics of the prohibited landing sector are proposed to be added as point (d)(5).

GM1 HPT-DSN.F.570 Touchdown/positioning marking

~~Intentionally left blank~~

(a) The centre of the TDPM should normally be at the centre of the FATO or the helicopter stand. However, when a TLOF in a FATO is larger than the minimum dimensions, the TDPM may be offset while ensuring containment of the undercarriage within the TLOF and the helicopter within the FATO.

(b) Where an elongated Performance Class 1 FATO/TLOF contains more than one TDPM, measures should be in place to ensure that only one can be used at a time.

(c) The touchdown/positioning circle (TDPC) should not be considered to be a reference for performing turns in hover. In view of the potential errors in turning, helicopter containment for hover turning should be set to 1.5D. Further guidance is provided in the Heliport Manual (Doc 9261).

(d) The prohibited landing sector marking, when provided, is not intended to move the helicopter away from objects around the FATO, but to ensure that the tail is not placed in an orientation that might constitute a hazard. This is achieved by having the helicopter nose clear of the hatched markings during the touchdown.

Rationale

The proposed point (b) originates from a recommendation in Annex 14 Vol. II, that has an operational aspect. It was therefore deemed appropriate not to be included in the present regulatory material as a certification specification.

Point (d) provides more information about the intended use of the prohibited landing sector marking and refers to the Heliport Manual for more information.

For paragraphs (a) and (c), see the rationale of the corresponding CS.

CS HPT-DSN.F.580 ~~Heliport name marking~~

~~(a) Applicability: A heliport name marking should be provided at a heliport where there is insufficient alternative means of visual identification.~~

~~(b) Characteristics: A heliport name marking should consist of the name or the alphanumeric designator of the heliport as used in radio (R/T) communications.~~

Intentionally left blank

Rationale

The provisions are proposed to be deleted, since they are not applicable to the heliports within aerodromes.

GM1 HPT-DSN.F.580 ~~Heliport name marking~~

~~(a) Location: The heliport name marking should be displayed on the heliport so as to be visible, as far as practicable, at all angles above the horizontal.~~

~~(b) Characteristics:~~

~~(1) A heliport name marking intended for use at night or during conditions of poor visibility should be illuminated, either internally or externally.~~

~~(2) The colour of the marking should contrast with the background and preferably be white.~~

~~(3) Runway-type FATOs: The characters of the marking should be not less than 3 m in height.~~

~~(4) All FATOs except runway-type FATOs: The characters of the marking should be not less than 1.5 m in height.~~

Intentionally left blank

Rationale

The provisions are proposed to be deleted, since they are not applicable to the heliports within aerodromes.

CS HPT-DSN.F.590 Helicopter ~~ground~~ taxiway markings and markers

(a) The objective of helicopter taxiway markings and markers is to provide visual cues enabling pilots to taxi safely along the taxiway by day and, if necessary, by night.

~~(a)~~(b) Applicability:

(1) The specifications for runway-holding position markings defined in CS ADR-DSN.L.575 and for intermediate holding position markings defined in CS ADR-DSN.L.580 are equally applicable to taxiways intended for ~~ground~~ taxiing of helicopters.

(2) The centre line of a helicopter ~~ground~~ taxiway should be identified with a marking.

(3) The edges of a helicopter ~~ground~~ taxiway, if not self-evident, should be identified with markers or markings.

~~(b)~~(c) Location:

(1) Helicopter ~~ground~~ taxiway markings should be along the centre line, and, if provided, along the edges of a helicopter ~~ground~~ taxiway.

~~(2) Helicopter ground taxiway edge markers should be located at a distance of 0.5 m to 3 m beyond the edge of the helicopter ground taxiway.~~

~~(3) Where provided, helicopter ground taxiway edge markers should be spaced at intervals of not more than 15 m on each side of straight sections and 7.5 m on each side of curved sections with a minimum of four equally spaced markers per section.~~

(2) Where provided, helicopter taxiway edge markers should be:

(i) located at a distance of 1 m to 3 m beyond the edge of the helicopter taxiway; and

(ii) spaced at intervals of not more than 15 m on each side of straight sections and 7.5 m on each side of curved sections with a minimum of four equally spaced markers per section.

~~(c)~~(d) Characteristics:

(1) On a paved taxiway, a~~A~~ helicopter ~~ground~~ taxiway centre line marking should be a continuous yellow line 15 cm in width. On an unpaved taxiway that will not accommodate painted markings, a helicopter taxiway centre line should be marked with flush in-ground 15 cm wide and approximately 1.5 m in length yellow markers, spaced at intervals of not more than 30 m on straight sections and not more than 15 m on curves, with a minimum of four equally spaced markers per section.

(2) Helicopter ~~ground~~ taxiway edge markings should be a continuous double yellow line, each 15 cm in width, and spaced 15 cm apart (nearest edge to nearest edge).

(3) A helicopter ~~ground~~ taxiway edge marker should not exceed the height of a plane originating at a height of 25 cm above the plane of the helicopter ~~ground~~ taxiway, at a distance of 0.5 m from the edge of the helicopter ~~ground~~ taxiway and sloping upwards and outwards at a gradient of 5 per cent to a distance of 3 m beyond the edge of the helicopter ~~ground~~ taxiway.

(4) Helicopter ~~ground~~ taxiway edge markers should be frangible to the ~~wheeled~~ undercarriage of helicopters and should not present a hazard for aircraft operations.

(5) A helicopter ~~ground~~ taxiway edge marker should be blue.

(6) If the helicopter ~~ground~~ taxiway is to be used at night, the edge markers should be internally illuminated or retro-reflective.

Rationale

The objective of the helicopter taxiway markings and markers is proposed to form new point (a), in line with other paragraphs of the CS-HPT-DSN. Due to this addition the rest of the points are renumbered.

In line with the change of concept introduced with amendment 9 of Annex 14 Vol. II, the attribute 'ground' is proposed to be deleted.

Moreover, points (c)(2) and (c)(3) are proposed to be merged, since they both refer to the location of the helicopter taxiway edge markers. It should be pointed out that – in line with amendment 9 of Annex 14 Vol. II – the minimum distance of such markers from the edge of the helicopter taxiway is proposed to be increased from 0.5 m to 1 m.

Furthermore, the provision for centreline marking of unpaved taxiways is proposed to be added in point (d)(1), in line with amendment 9 of Annex 14 Vol. II. A consequential addition regarding the text of point (d)(1) – restricting its applicability to paved taxiways – is also proposed.

Regarding the frangibility of the markers, two amendments are proposed in point (d)(4):

- *That the term 'wheeled' is deleted, so that the skidded helicopters are also included, and*
- *that the relevant point (c) of the GM is upgraded to a CS, due to its importance, especially considering that the heliports under the scope of the CS-HPT-DSN are the ones within aerodromes and therefore the aircraft in general (i.e. including the aeroplanes) should be taken into account regarding the safety of operations.*

An editorial change was also made in (b)(1).

GM1 HPT-DSN.F.590 Helicopter ~~ground~~ taxiway markings and markers

(a) Ground taxi-routes and air taxi-routes over a taxiway are not required to be marked.

(b) Where necessary, signage should be provided on an aerodrome to indicate that a ~~ground~~ taxiway is suitable only for the use of helicopters.

(c) ~~A helicopter ground taxiway edge marker should not present a hazard for aircraft operations~~.Helicopter taxiway edge markers can be of the form described in the Heliport Manual (Doc 9261).

Rationale

In line with the change of concept introduced with amendment 9 of Annex 14 Vol. II, the attribute 'ground' is proposed to be deleted.

Furthermore, the case of air taxi-routes over taxiways has also been added to the text, so that the proposed guidance is related in general to taxi-routes collocated with helicopter taxiways. In this case, the marking and markers are the ones of the helicopter taxiways, and no further markings or markers are required, which is what is stated in point (a) of the GM.

Regarding the proposed deletion of the current text of point (c), see the rationale of the corresponding CS. The new proposed text of point (c) contains a reference to the Heliport Manual for the form of the helicopter taxiway edge markers that can be used on helicopter taxiways.

CS HPT-DSN.F.600 Helicopter air taxi-route~~way~~ markings and markers

(a) The objective of helicopter air taxi-route markings and markers is to provide visual cues enabling pilots to air-taxi safely by day and, if necessary, by night.

~~(a)~~(b) Applicability:

(1) The specifications for runway-holding position markings defined in CS ADR-DSN.L.575 and intermediate holding position markings defined in CS ADR-DSN.L.580 are equally applicable to ~~taxiways intended for air taxiing of helicopters~~helicopter air taxi-routes.

(2) ~~The centre line of a helicopter air taxiway or, if not self-evident, the edges of a helicopter air taxiway, should be identified with markers or markings.~~The specifications for air taxi-route markings and markers are applicable in the case of air taxi-routes not collocated with a taxiway.

(3) The centre line of a helicopter air taxi-route should be identified with markers or markings.

~~(b)~~(c) Location:

~~(1) A helicopter air taxi-routeway centre line marking or flush in-ground centre line markers should be located along the centre line of the helicopter air taxi-routeway.~~

~~(2) Helicopter air taxiway edge markings should be located along the edges of a helicopter air taxiway.~~

~~(3) Helicopter air taxiway edge markers should be located at a distance of 1 m to 3 m beyond the edge of the helicopter air taxiway.~~

~~(c)~~(d) Characteristics:

(1) A helicopter air taxi-route~~way~~ centre line should be marked with a continuous yellow line 15 cm in width, when on a paved surface.

~~(2) The edges of a helicopter air taxiway, when on a paved surface, should be marked with continuous double yellow lines each 15 cm in width, and spaced 15 cm apart (nearest edge to nearest edge).~~

~~(3)~~(2) Where a helicopter air taxi-route~~way~~ is located on an unpaved surface and painted markings of a helicopter air taxi-route~~way~~ centre line cannot be provided, it should be marked with ~~flush in-ground 15 cm wide and approximately 1.5 m in length yellow~~ markers, spaced at intervals of not more than 30 m on straight sections and not more than 15 m on curves, with a minimum of four equally spaced markers per section.

~~(4) Helicopter air taxiway edge markers, where provided, should be spaced at intervals of not more than 30 m on each side of straight sections and not more than 15 m on each side of curves, with a minimum of four equally spaced markers per section.~~

~~(5) Helicopter air taxiway edge markers should be frangible.~~

~~(6) Helicopter air taxiway edge markers should not penetrate a plane originating at a height of 25 cm above the plane of the helicopter air taxiway, at a distance of 1 m from the edge of the helicopter air taxiway and sloping upwards and outwards at a gradient of 5 per cent to a distance of 3 m beyond the edge of the helicopter air taxiway.~~

~~(7) A helicopter air taxiway edge marker should be of a colour (or colours) that contrasts (contrast) effectively against the operating background. The red colour should not be used for markers.~~

~~(8)~~(3) If the helicopter air taxi-route~~way~~ is to be used at night, ~~helicopter air taxiway edge~~ markers should be either internally illuminated or retro-reflective.

Rationale

The objective of the helicopter air taxi-route markings and markers is proposed to be included in the CS. Due to this addition the rest of the points are renumbered.

Additionally, in line with the change of concept introduced with amendment 9 of Annex 14 Vol. II, it is proposed that:

- *the provisions (b)(2), (c)(2), (c)(3), (d)(2), and (d)(4) to (d)(7) – related to the helicopter air taxiway edge markings and markers – are deleted;*
- *the provisions (c)(1), (d)(1) and (d)(8) related to the helicopter air taxiway centreline markings or markers are amended to read 'taxi-route'; and*
- *the term 'helicopter air taxiway edge markers' in point (d)(8) is amended to 'markers'. In this way the provision applies to the air taxi-route centreline markers.*

Due to the proposed deletions in paragraph (d) a further renumbering of the provisions is also required.

Similarly, point (b)(1) is proposed to be amended by substituting the terms 'taxiways intended for air taxiing of helicopters' by 'helicopter air taxi-routes'.

In addition, based on amendment 10 of Annex 14, Vol. II, the characteristics regarding the length and the width of the markers included in point (d)(3) are proposed to be deleted, since they are related to the air taxiway markers.

The following points are proposed to be added:

- *The new text in point (b)(2) provides clarification about the applicability of the present paragraph. When the taxi-route is collocated with a helicopter taxiway, the markings and markers will be the ones of the taxiway. This is covered in CS HPT-DSN.F.590. The only other case, where markings and markers would be required, is that of an air taxi-route not collocated with a taxiway.*
- *The new point (b)(3) is carried over from the Annex 14 Vol. II and specifies the part of the air taxi-route to be marked.*

GM1 HPT-DSN.F.600 Helicopter air taxi-route~~way~~ markings and markers

(a) ~~Helicopter air taxi-routes are not required to be marked.~~Further guidance on the characteristics of air taxi-route markers is provided in the Heliport Manual (Doc 9261).

(b) Where a helicopter air taxi-route~~way~~ could be confused with a helicopter ground taxi-route~~way~~, signage should be provided to indicate the mode of taxi operations that are permitted.

~~(c) Helicopter air taxiway edge markers should not be located at a distance from the centre line of the helicopter air taxiway of less than 0.5 times the largest overall width of the helicopter for which it is designed.~~ When markers are used, the air taxi-manoeuvre may be less accurate than when following a centre line marking. For that reason, the designer should ensure that an air taxi-route with markers is not sited in close proximity to taxiways and other taxi-routes. See also GM1 HPT-DSN.C.210.

~~(d) Helicopter air taxiway edge markers should not penetrate a plane originating at a height of 25 cm above the plane of the helicopter air taxiway, at a distance from the centre line of the helicopter air taxiway of 0.5 times the largest overall width of the helicopter for which it is designed, and sloping upwards and outwards at a gradient of 5 per cent.~~

Rationale

The current text of point (a) is proposed to be transferred (appropriately amended) in GM1 HPT-DSN.F.590. (See also the rationale of the corresponding CS.) In its place, the proposed new text provides a reference to the Heliport Manual, where the characteristics of helicopter air taxi-route markers can be found.

Point (b) is proposed to be amended by substituting the term 'taxiway' with the term 'taxi-route', in line with amendment 9 of Annex 14 Vol. I and the proposed amendments in the corresponding CS.

Furthermore, for the same reason, the current text of points (c) and (d) are proposed to be deleted.

The proposed new text in point (c) originates from the Heliport Manual and is added here, because it highlights the reduced accuracy of the air-taxiing, when markers are used instead of a centreline marking, and the implications of this reduced accuracy regarding the determination of the appropriate distances between air taxi-routes and taxiways or other air-taxi-routes. A reference to GM1 HPT-DSN.C.210 has been added, which mentions the aspect of the wind velocity/turbulence induced by the rotor downwash.

CS HPT-DSN.F.610 Helicopter stand markings

(a) The objective of the helicopter stand markings is to provide to the pilot a visual indication of an area that is free of obstacles and in which permitted manoeuvring, and all necessary ground functions, may take place; identification and D-value limitations, when required; and guidance for manoeuvring and positioning of the helicopter within the stand.

~~(a)~~(b) Applicability:

(1) A helicopter stand perimeter marking should be provided on all helicopter stands ~~designed for turning. If a helicopter stand perimeter marking is not practicable, a central zone perimeter marking should be provided instead if the perimeter of the central zone is not self-evident~~.

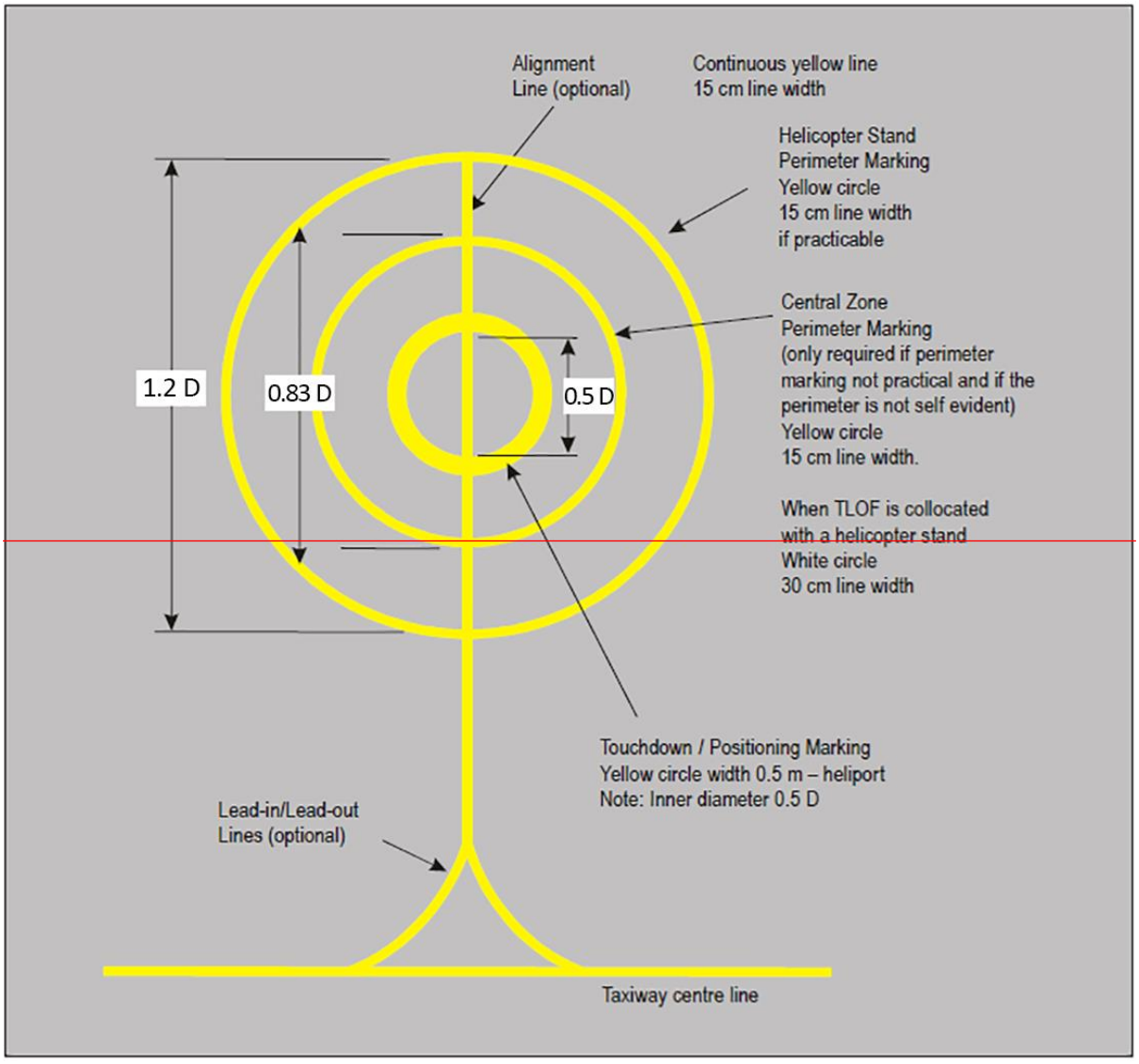
(2) ~~For a helicopter stand that is intended to be used for taxi-through and which does not allow a helicopter to turn, a stop line should be provided.~~A helicopter stand should be provided with the appropriate TDPM (see Figures F-5 and F-6).

(3) Alignment lines and lead-in/lead-out lines should be provided on a helicopter stand ~~(see Figures F-4 and F-5)~~.

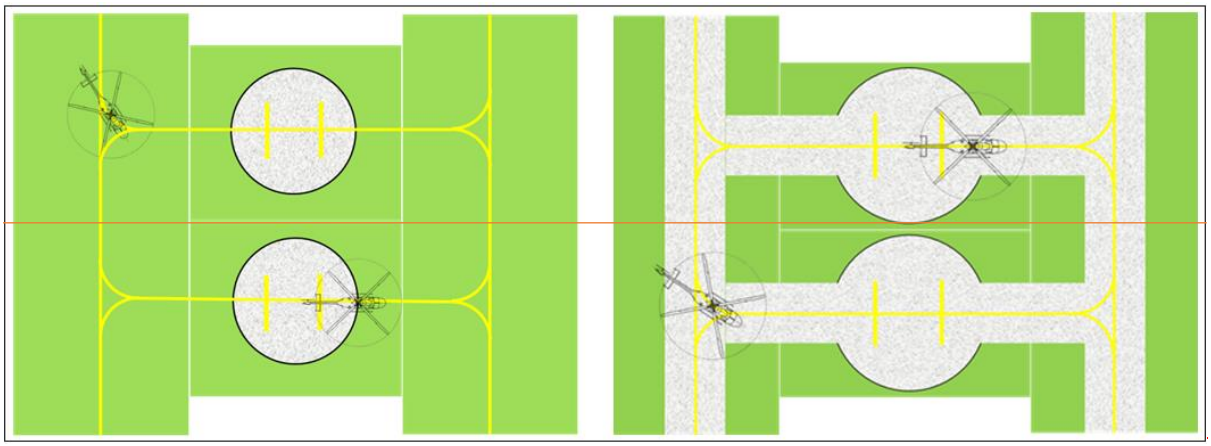
~~(b)~~(c) Location:

(1) The TDPM, alignment lines and lead-in/lead-out lines should be located such that every part of the helicopter can be contained within the helicopter stand during positioning and permitted manoeuvring.~~A helicopter stand perimeter marking on a helicopter stand designed for turning or, a central zone perimeter marking, should be concentric with the central zone of the stand.~~

(2) Alignment lines and lead-in/lead-out lines should be located as shown in Figure F-6.~~For a helicopter stand that is intended to be used for taxi-through and which does not allow the helicopter to turn, a stop line should be located on the helicopter ground taxiway axis at right angles to the centre line.~~



~~***Figure F-4. Helicopter stand markings at a stand designated for hover turning***~~



~~***Figure F-5. Taxi-through helicopter stand markings***~~

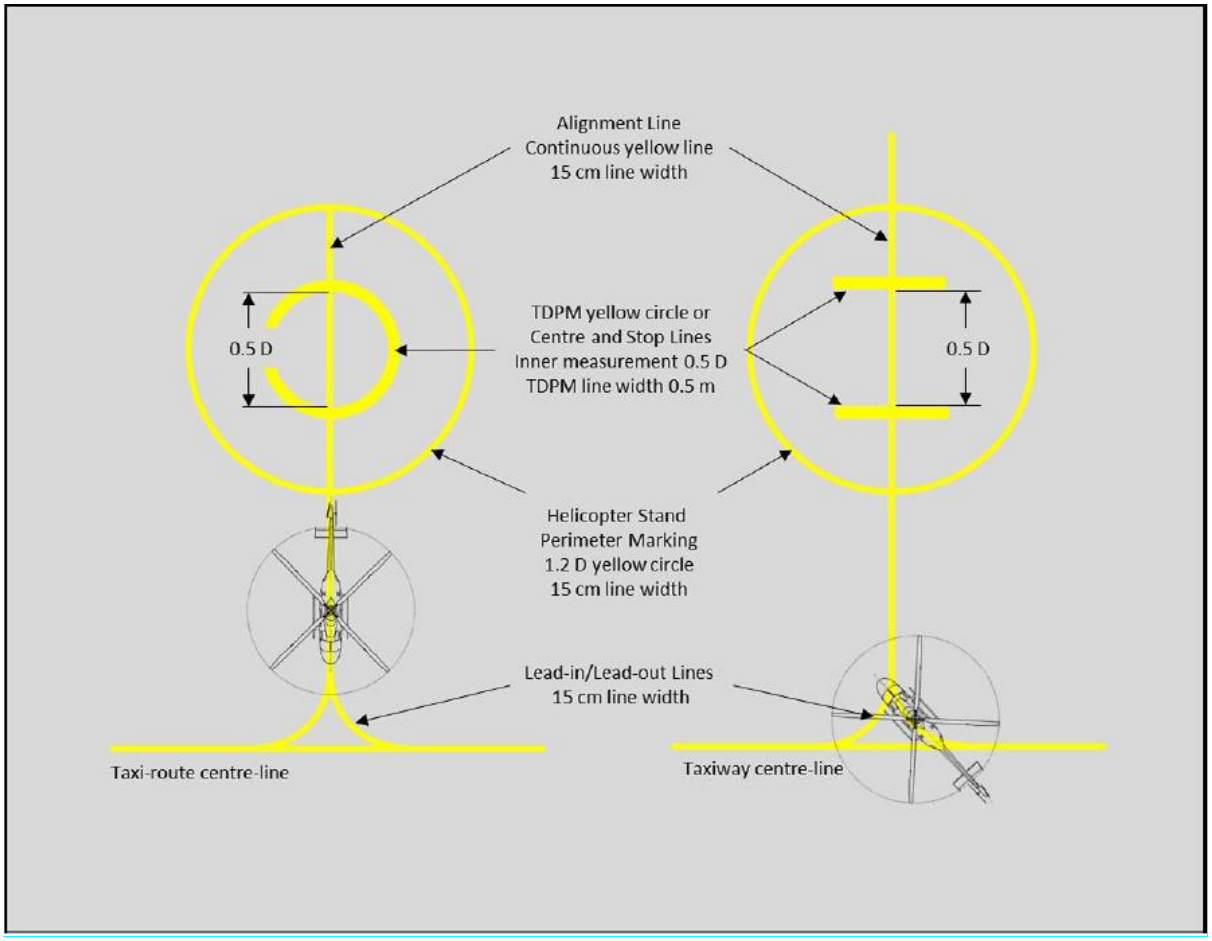


Figure F-6. Helicopter stand markings

~~(c)~~(d) Characteristics:

(1) A helicopter stand perimeter marking should ~~be a~~ consist of a continuous yellow ~~circle~~ line and have a line width of 15 cm.

(2) ~~A central zone perimeter marking should be a yellow circle and have a line width of 15 cm, except when the TLOF is collocated with a helicopter stand, in which case the~~

~~characteristics of the TLOF perimeter markings should apply.~~The TDPM should have the characteristics described in CS HPT-DSN.F.570 above.

~~(3) For a helicopter stand that is intended to be used for taxi-through and which does not allow the helicopter to turn, the yellow stop line should not be less than the width of the helicopter ground taxiway and should have a line thickness of 50 cm.~~

(3)~~(4)~~ Alignment lines and lead-in/lead-out lines should be continuous yellow lines and should have a width of 15 cm.

(4)~~(5)~~ Curved portions of alignment lines and lead-in/lead-out lines should have radii appropriate to the most demanding helicopter type the helicopter stand is intended to serve.

(5)~~(6)~~ Stand identification markings should be marked in a contrasting colour so as to be easily readable.

(6)~~(7)~~ Where it is intended that helicopters proceed in one direction only, arrows indicating the direction to be followed may be added as part of the alignment lines.

Rationale

The objective of the helicopter stand markings – as included in amendment 9 of Annex 14, Vol. II – is proposed to be added in the CS. Due to this addition the rest of the points are renumbered.

For the rest, the amendment of this CS is based on amendment 9 of Annex 14 Vol. II. With this amendment:

- *The use of the helicopter stand perimeter line is generalised to all stands; not only to those designed for turning.*
- *An appropriate form of the TDPM is provided at all stands, as already described in CS HPT-DSN.F.570.*
- *The concept of the central zone is no longer applicable; the required attributes are satisfied either through the existence of a TLOF with the corresponding marking, or the combination of a ground taxiway attributes and the TDPM.*

As a direct consequence of the above, provision (b)(1) is proposed to be amended by deleting the terms 'for turning' and the requirement of a central zone perimeter marking. An editorial change is also proposed. Furthermore, point (b)(2) – related to the required stand markings, in the case of stands intended to be used unidirectionally – is proposed to be amended so as to be generic. The proposed deletion of the reference to Figures F-4 and F-5 is based on the fact that in the current place they seem to refer only to the alignment and lead-in/out lines. A reference to figures D-1 to D-5 is proposed to be added to the corresponding GM, considering that these figures contain further examples of stand markings.

For the same reasons, provisions (c)(1) and (c)(2), that describe the location of the markings required for turning or taxi-through, are proposed to be replaced by provisions related to the generic requirement that the markings should assure containment of the helicopter within the stand and to refer to Figure F-6 for the description of the location of the alignment and lead-in/lead-out lines.

Point (d)(1) is proposed to be generalised by substituting the term 'circle' with the term 'line'. With this change, the applicability of the provision is extended to all forms of the helicopter stand perimeter markings. The requirement for a continuous line is also proposed for addition.

Point (d)(2) – referring to the central zone – is proposed to be deleted for the reasons explained above and replaced by a reference to CS HPT-DSN.F.570.

Point (d)(3) – referring to the characteristics of the stop line – is proposed to be deleted, since these requirements are already described in the CS HPT-DSN.F.570, that is also proposed for amendment as described previously. Subsequent paragraphs are renumbered, due to this proposed deletion.

Finally, Figures F-4 and F-5 are proposed to be replaced by Figure F-6, which illustrates equivalent information contained in both the Figures to be replaced, based on the new, proposed requirements.

GM1 HPT-DSN.F.610 Helicopter stand markings

(a) Examples of stands and their markings can be seen in Figures D-1 to D-5.

(b) Helicopter stand identification markings should be provided where there is a need to identify individual stands.

Rationale

A reference to Figures contained in Chapter D and illustrating various arrangements of stands and their safety areas (including markings) is proposed to be added in point (a). (See also the rationale of the CS.) The already existing provision becomes point (b).

CS HPT-DSN.F.620 Flight path alignment guidance marking

(a) The objective of a flight path alignment guidance marking is to provide the pilot with a visual indication of the available approach and/or departure path direction(s).

[…]

~~(c)~~(d) Characteristics:

(1) A flight path alignment guidance marking should consist of one or more arrows marked on the TLOF, FATO and/or safety area surface, as shown in Figure F-~~6~~7. The stroke of the arrow(s) should be 50 cm in width and at least 3 m in length. When combined with a flight path alignment guidance lighting system, it should take the form shown in Figure F-~~6~~7, which includes the scheme for marking the 'heads of the arrows', which are always of the same size, regardless of the stroke length.

[…]

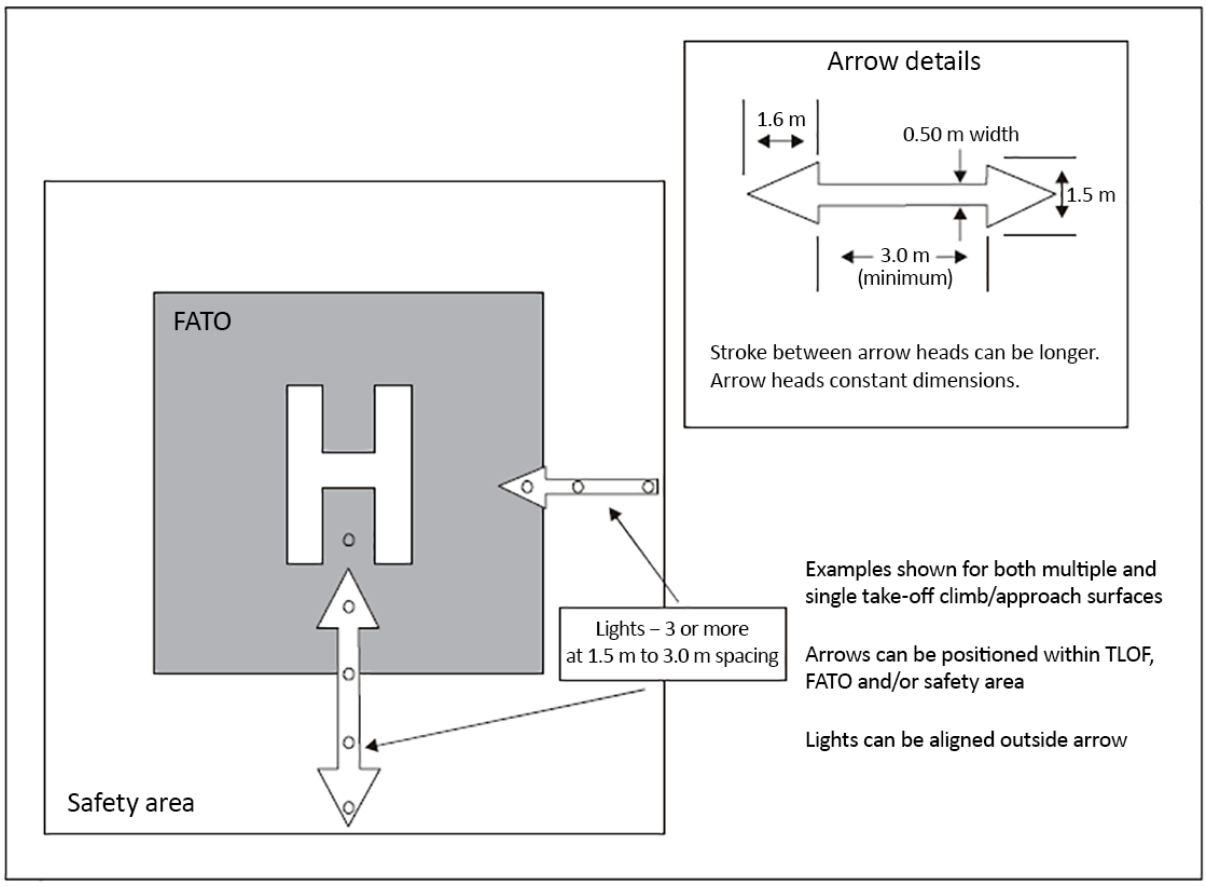


Figure F-~~6~~7. Flight path alignment guidance markings and lights

Rationale

In line with previous paragraphs, the objective of the flight path alignment guidance marking – introduced with amendment 9 of Annex 14 Vol. II – is proposed to be included in the CS as point (a). Due to this addition the rest of the points are renumbered.

Re-numbering of two references to figure F-6 and of Figure F-6 itself is necessary, based on the proposed addition of a previous figure.

CS HPT-DSN.F.628 Lights - general

Intentionally left blank

Rationale

See rationale for the GM.

GM1 HPT-DSN.F.628 Lights - general

(a) As helicopters will generally come very close to extraneous light sources, it is particularly important to ensure that, unless such lights are navigation lights exhibited in accordance with applicable regulations, they are screened or located so as to avoid direct and reflected glare.

(b) Systems addressed in CS HPT-DSN.F.640, CS HPT-DSN.F.660, CS HPT-DSN.F.670 and CS HPT-DSN.F.680 are designed to provide effective lighting cues based on night conditions. Where lights are to be used in conditions other than night (i.e. day or twilight), it may be necessary to increase the intensity of the lighting to maintain effective visual cues by use of a suitable brilliancy control. Guidance is provided in the Aerodrome Design Manual (Doc 9157), Part 4 — Visual Aids.

(c) In cases where operations into a heliport are to be conducted at night with Night Vision Imaging Systems (NVIS), it is important to ensure that all heliport lighting are compatible with the NVIS such as through the addition of infrared emitters to the heliport lighting. Where such additional measures are not practicable, helicopter operators using NVIS are to be made aware of it. See also ADR.OPS.A.070.

Rationale

The present paragraph is proposed to be added, to include guidance material that is applicable to lights in general and would not be suitable to be added in any of the following paragraphs that are related to specific light systems. All the proposed points stem from Annex 14 Vol. II.

Proposed point (a) highlights the necessity to screen or suitably locate extraneous light sources, since helicopters routes may come closer to such lights sources and pilots are more likely to be subjected to glare.

Point (b) is proposed to be added, to be pointed out that the intensity of the light systems, that are mentioned, is determined based on night conditions. Furthermore, considering that the proposed CS-HPT-DSN include the utilisation of PinS procedures, the meteorological conditions might necessitate the use of lights with an increased intensity in comparison with the one suitable for VMC.

Point (c) is proposed to be added, to highlight the necessity to provide lights that are compatible with NVIS and inform the helicopter operators about the provision (or non-provision) of such lights. The text originates from a note in Annex 14, Vol. II that was introduced with amendment 9 and changed with amendment 10. A reference to the related provision ADR.OPS.A.070 has been included.

CS HPT-DSN.F.630 Approach lighting system

(a) The objective of an approach lighting system is to allow the helicopter operator, by day and night, to visually identify the heliport and align the helicopter on the centreline of the FATO upon arriving at a prescribed point on the approach flight path.

~~(a)~~(b) Applicability: ~~Where provided at a heliport, an approach lighting system should indicate a preferred approach direction.~~An approach lighting system should be provided at a heliport where it is desirable and practicable to indicate a preferred approach direction.

[…]

~~(c)~~(d) Characteristics:

(1) An approach lighting system should consist of a row of three lights spaced uniformly at 30 m intervals and of a crossbar 18 m in length at a distance of 90 m from the perimeter of the FATO as shown in Figure F-~~7~~8. The lights forming the crossbar should be as nearly as practicable in a horizontal straight line at right angles to, and bisected by, the line of the centre line lights, and spaced at 4.5 m intervals.

[…]

(5) The flashing lights should have a flash frequency of one per second and their light distribution should be as shown in Figure F-~~9~~10, Illustration 2. The flash sequence should commence from the outermost light and progress towards the crossbar.

[…]

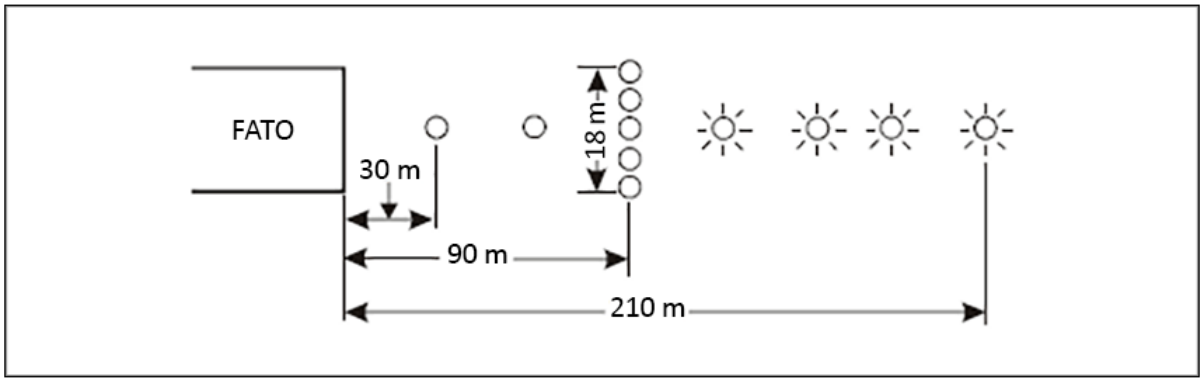


Figure F-~~7~~8. Approach lighting system

Rationale

The objective of the approach lighting system – introduced with amendment 10 of Annex 14 Vol. II – is proposed to be included in the CS. Due to this addition the rest of the points are renumbered.

The text included in the applicability is proposed to be reworded, in line with Annex 14 Vol. II, in order to better indicate the conditions under which an approach lighting system should be provided.

In addition, the re-numbering of two references to figures and of Figure F-7 itself is necessary, based on the proposed addition of a previous figure.

GM1 HPT-DSN.F.630 Approach lighting system

(a) Sequenced flashing lights may be useful where identification of the approach lighting system is difficult due to surrounding lights.

(b) The following intensity settings have been found suitable:

(1) steady lights — 100 per cent, 30 per cent and 10 per cent; and

(2) flashing lights — 100 per cent, 10 per cent and 3 per cent.

Additional guidance on light intensity controls is given in GM1 ADR-DSN.M.615.

Rationale

The two proposed points stem from Notes of Annex 14, Vol. II. They provide information to the heliport designers regarding the conditions that might necessitate the use of sequenced flashing lights and the intensity settings of the steady and flashing lights.

CS HPT-DSN.F.640 Flight path alignment guidance lighting system

(a) The objective of a flight path alignment guidance lighting system is to indicate, by day and night, available approach and/or departure flight path direction(s).

~~(a)~~(b) Applicability: ~~Where provided at a heliport, a flight path alignment guidance lighting system (or systems) should indicate the available approach and/or departure path direction(s).~~ Flight path alignment guidance lighting system(s) should be provided at a heliport where it is desirable and practicable to indicate available approach and/or departure path direction(s).

[…]

~~(c)~~(d) Characteristics:

[…]

(3) If more than one flight path alignment system is used to indicate the available approach and/or departure path direction(s), the characteristics for each system are typically kept the same (see Figure F-~~6~~7).

[…]

(5) The distribution of the lights should be as indicated in Figure F-~~9~~10, Illustration 5.

[…]

Rationale

In line with previous paragraphs, the objective of the flight path alignment guidance lighting system – introduced with amendment 10 of Annex 14 Vol. II – is proposed to be included in the CS. Due to this addition the rest of the points are renumbered.

The text included in the applicability is proposed to be reworded, in line with Annex 14 Vol. II, in order to better indicate the conditions under which a flight path alignment guidance lighting system should be installed.

In addition, the re-numbering of two references to figures is necessary, based on the proposed addition of a previous figure.

GM1 HPT-DSN.F.640 Flight path alignment guidance lighting system

~~The flight path alignment guidance lighting can be combined with a flight path alignment guidance marking (or markings).~~

Intentionally left blank

Rationale

The current provision is proposed to be deleted, because it can be considered superfluous, by considering point (c)(2) (based on the new numbering) of the corresponding CS.

CS HPT-DSN.F.650 Visual alignment guidance system

(a) The objective of a visual alignment guidance system is to provide conspicuous and discrete cues to assist the pilot to attain, and maintain, a specified approach track to a heliport.

~~(a)~~(b) Applicability: ~~Where provided at a heliport, a visual alignment guidance system should provide guidance to the pilot during the approach to a heliport.~~A visual alignment guidance system should be provided to serve the approach to a heliport where one or more of the following conditions exist, especially at night:

(1) obstacle clearance, noise abatement or traffic control procedures require a particular direction to be flown;

(2) the environment of the heliport provides few visual surface cues; and

(3) it is physically impracticable to install an approach lighting system.

[…]

~~(c)~~(d) Signal format:

[…]

(2) The divergence of the 'on track' sector of the system should be 1° as shown in Figure F-~~8~~9.

[…]

~~(e)~~(f) Approach track and azimuth setting:

[…]

(3) The characteristics of the obstacle protection surface specified in CS HPT-DSN.F.660~~(h)~~(i)(2), Table F-1 and Figure F-1~~0~~1 should equally apply to the system.

[…]

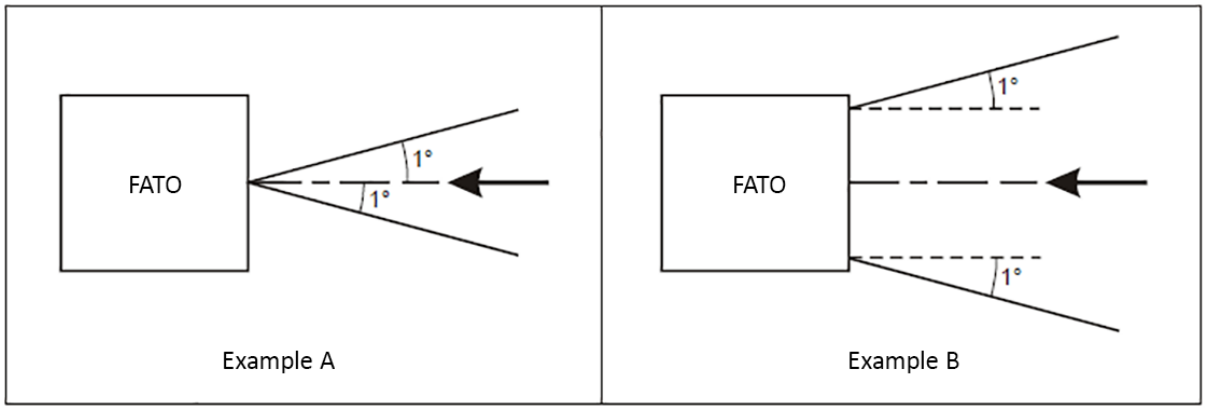


Figure F-~~8~~9. Divergence of the 'on track' sector

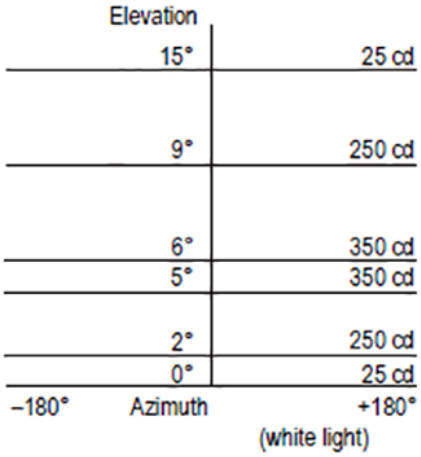


Illustration 1 – Approach light steady burning

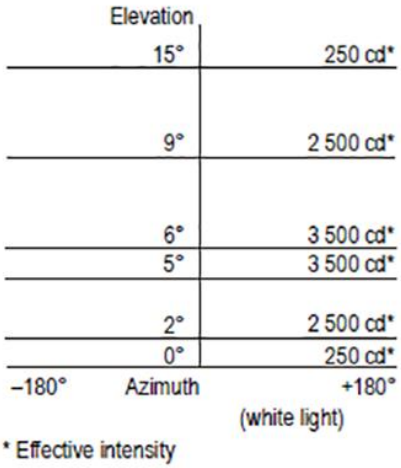


Illustration 2 – Approach light flashing

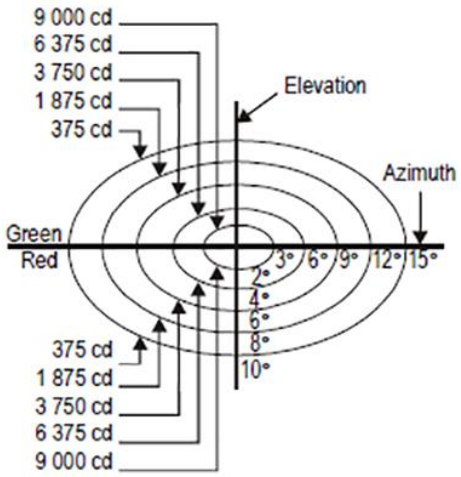


Illustration 3 – HAPI system

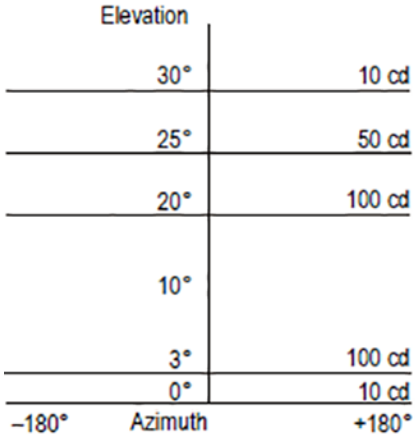
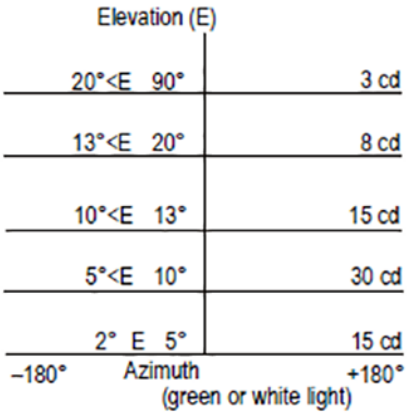


Illustration 4 – Final approach and take-off area perimeter lights and aiming point lights



Note – Additional values may be required in the case of installations requiring identification by means of the lights at an elevation of less than two degrees.

Illustration 5 – TLOF perimeter lights and flight path alignment guidance lighting system

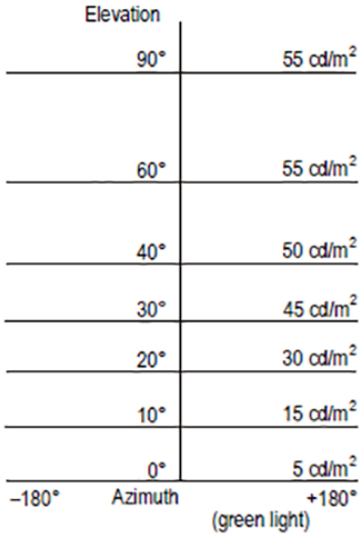


Illustration 6 – Touchdown and lift-off area luminescent panels

Figure F-~~9~~10. Isocandela diagrams

[…]

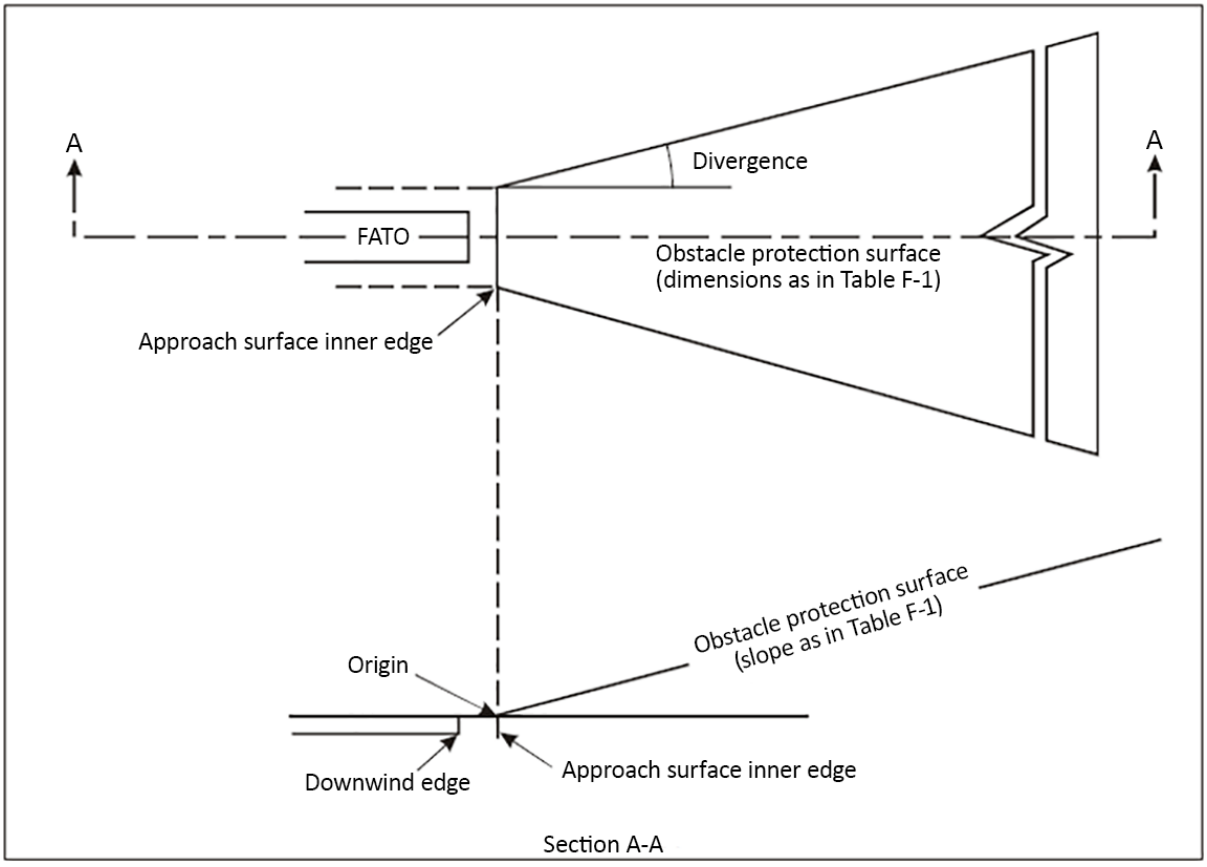


Figure F-1~~0~~1. Obstacle protection surface for visual approach slope indicator systems

Rationale

In line with previous paragraphs, the objective of the visual alignment guidance system – introduced with amendment 9 of Annex 14 Vol. II – is proposed to be included in the CS. Due to this addition the rest of the points are renumbered.

Furthermore, the text included in the applicability is proposed to be reworded, in order to better indicate the conditions under which a visual alignment guidance system should be installed. The proposed text is transfer here from the corresponding GM. It was included at the level of recommended practice in Annex 14, Vol. II with amendment 9.

Moreover, in point (f)(3), the amendment of a reference to a particular point in CS HPT.DSN.660 is proposed, based on the re-numbering that is proposed in the aforementioned CS.

In addition, the re-numbering of two references to figures in points (d)(2) and (f)(3), and of Figures F-9 and F-10 themselves is necessary, based on the proposed addition of a previous figure.

Finally, the caption of illustration 4 in Figure F-9 (proposed new F-10) is proposed to be reworded, in line with previous proposed amendments.

GM1 HPT-DSN.F.650 Visual alignment guidance system

~~A visual alignment guidance system should be provided where one or more of the following conditions exist:~~

~~(a) obstacle clearance, noise abatement or traffic control procedures require a particular direction to be flown;~~

~~(b) the environment of the heliport provides few visual surface cues; and~~

~~(c) it is physically impracticable to install an approach lighting system.~~

Intentionally left blank

Rationale

The current text is proposed to be moved to the applicability section of the corresponding CS.

CS HPT-DSN.F.660 Visual approach slope indicator

(a) The objective of a visual approach slope indicator is to provide conspicuous and discrete colour cues within a specified elevation and azimuth, to assist the pilot to attain and maintain the approach slope to a desired position within a FATO.

~~(a)~~(b) Applicability: ~~Where provided at a heliport, a visual slope indicator system should provide information on the approach angle necessary to maintain a safe height over obstacles on the approach to a heliport.~~A visual approach slope indicator should be provided to serve the approach to a heliport, whether or not the heliport is served by other visual approach aids or by non-visual aids, where one or more of the following conditions exist, especially at night:

(1) obstacle clearance, noise abatement or traffic control procedures require a particular slope to be flown;

(2) the environment of the heliport provides few visual surface cues; and

(3) the characteristics of the helicopter require a stabilised approach.

[…]

~~(d)~~(e) Characteristics of the HAPI signal format:

[…]

(2) The signal format of the HAPI should be as shown in Figure F-1~~1~~2, Illustrations A and B.

[…]

Sector	Format
Above	Flashing green
On slope	Green
Slightly below	Red
Below	Flashing red

Illustration A

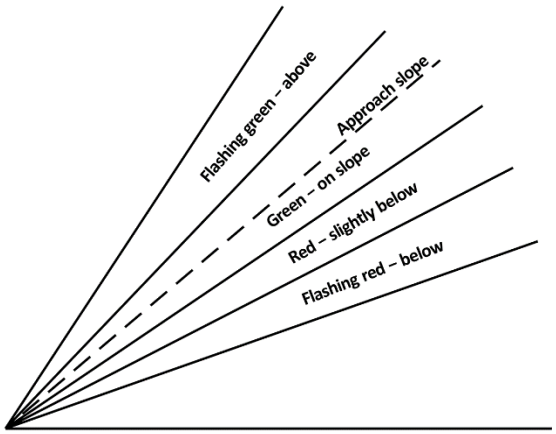


Illustration B

Figure F-1~~1~~2. HAPI signal format

~~(e)~~(f) Light distribution:

(1) The light intensity distribution of the HAPI in red and green colours should be as shown in Figure F-~~9~~10, Illustration 3.

[…]

~~(h)~~(i) Obstacle protection surface (applicable to PAPI, APAPI and HAPI):

[…]

(2) The characteristics of the obstacle protection surface, i.e. origin, divergence, length and slope, should correspond to those specified in the relevant column of Table F-1 and in Figure F-1~~0~~1.

[…]

Rationale

In line with previous paragraphs, the objective of the visual approach slope indicator – introduced with amendment 9 of Annex 14 Vol. II – is proposed to be included in the CS. Due to this addition the rest of the points are renumbered.

Furthermore, the text included in the applicability is proposed to be reworded, in order to better indicate the conditions under which a visual approach slope indicator (VASI) should be installed. The proposed text is transfer here from the corresponding GM and was included at the level of recommended practice in Annex 14, Vol. II with amendment 9. A clarification has been added, regarding the fact that the VASI should be provided regardless of the existence of other visual approach aids or by nonvisual aids, as this is also contained in the Annex 14 Vol. II text.

In addition, the re-numbering of three references to figures, and of Figure F-11 is necessary, based on the proposed addition of a previous figure.

GM1 HPT-DSN.F.660 Visual approach slope indicator

~~(a) A visual approach slope indicator should be provided for a heliport where one or more of the following conditions exist:~~

~~(1) obstacle clearance, noise abatement or traffic control procedures require a particular slope to be flown;~~

~~(2) the environment of the heliport provides few visual surface cues; and~~

~~(3) the characteristics of the helicopter require a stabilised approach.~~

~~(b)~~(a) When more than one visual approach slope indicator is installed at an aerodrome (e.g. PAPI, APAPI), a visual approach slope indicator should be designed and calibrated in order to give a clear and unambiguous indication to helicopter pilots approaching to land.

~~(c)~~(b) A heliport visual approach slope indicator should be located adjacent to the nominal aiming point and aligned in azimuth with the preferred approach direction.

~~(d)~~(c) Care is required in the design of the unit to minimise spurious signals between the signal sectors, and at the azimuth coverage limits.

~~(e)~~(d) Larger azimuth coverage can be obtained by installing the HAPI system on a turntable.

Rationale

The current text of point (a) is proposed to be moved to the applicability section of the corresponding CS, and to be substituted with the objective of the visual approach slope indicator – introduced with amendment 9 of Annex 14 Vol. II – in line with previous paragraphs.

Points (b) – (e) are numbered as a consequence of this proposed amendment.

CS HPT-DSN.F.670 Final approach and take-off area ~~lighting systems~~perimeter lights

(a) The objective of FATO perimeter lights is to provide to the pilot operating at night an indication of the shape, location and extent of the FATO.

~~(a)~~(b) Applicability: FATO perimeter lights should be provided where a FATO is established at a heliport intended for use at night. They can be omitted where the FATO and the TLOF are nearly coincidental and the TLOF lights are provided, or the extent of the FATO is self-evident.

~~(b)~~(c) Location: FATO perimeter lights should be placed along the edges of the FATO. The lights should be uniformly spaced as follows:

[…]

~~(c)~~(d) Characteristics:

(1) FATO perimeter lights should be fixed omnidirectional lights showing white or variable white. ~~Where the intensity of the lights is to be varied, the lights should show variable white.~~

(2) The light distribution of FATO perimeter lights should be as shown in Figure F-~~9~~10, Illustration 4.

[…]

Rationale

In line with previous paragraphs, the objective of the FATO perimeter lights – introduced with amendment 9 of Annex 14 Vol. II – is proposed to be included in the CS. Due to this addition the rest of the points are renumbered.

Furthermore, based on amendment 10 of Annex 14 Vol. II, the term 'perimeter' is proposed to be added to the terms 'FATO lights', to better indicate the nature of the lights. In line with this proposed amendment, the title is also proposed to be reworded.

In point (d)(1) a rewording is also proposed regarding the feature of the variable intensity, in line with amendment 10 of Annex 14 Vol. II., without changing the essence of the provision.

In addition, the re-numbering of one reference to a figure is necessary, based on the proposed addition of a previous figure.

GM1 HPT-DSN.F.670 Final approach and take-off area ~~lighting systems~~perimeter lights

Intentionally left blank

Rationale

For the rewording of the title, see rational of the corresponding CS.

CS HPT-DSN.F.680 Aiming point lights

(a) The objective of aiming point lights is to provide a visual cue indicating to the pilot by night the preferred approach/departure direction, the point to which the helicopter approaches to a hover before positioning to a TLOF, where a touchdown can be made, and that the surface of the FATO is not intended for touchdown.

[…]

~~(c)~~(d) Characteristics:

(1) Aiming point lights should form a pattern of at least six omnidirectional white lights (see Figure F-1~~2~~3). The lights should be arranged equidistantly with a light at the apex and at both corners.

[…]

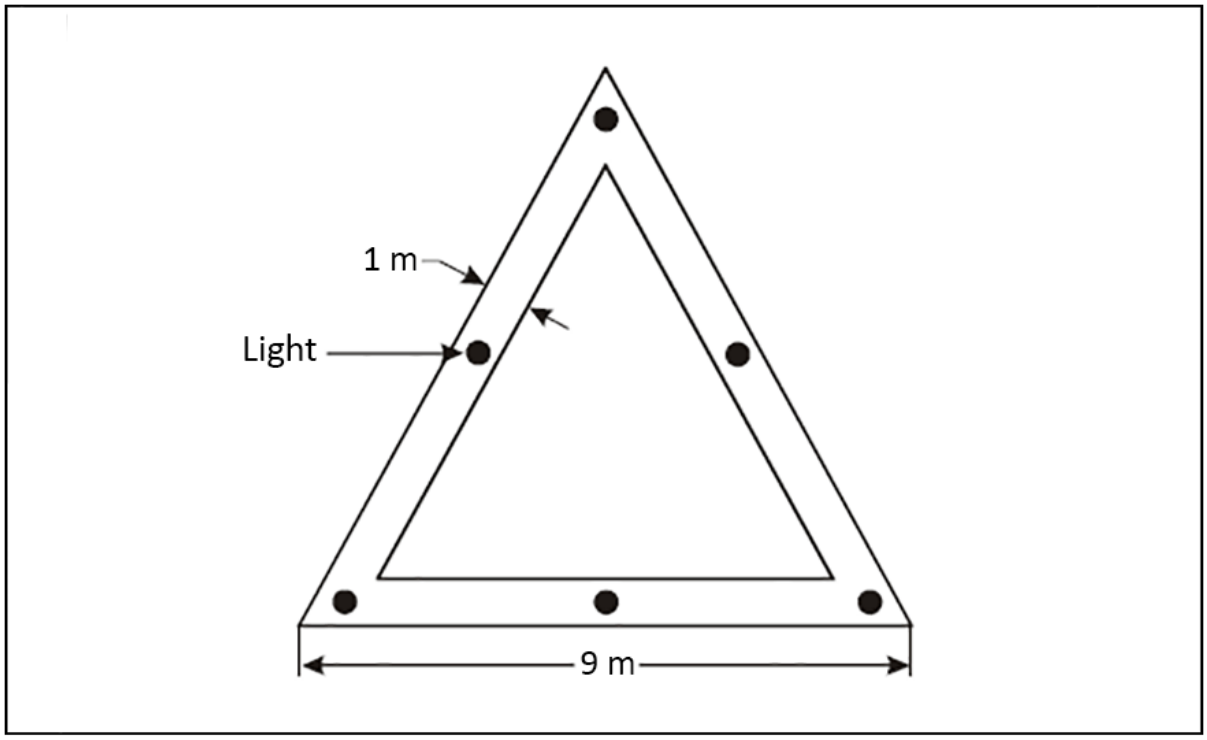


Figure F-1~~2~~3. Aiming point marking and lighting

Rationale

The objective of the aiming point lights – introduced with amendment 9 of Annex 14, Vol. II – is proposed to be included in the CS. Due to this addition the rest of the points are renumbered.

Furthermore, in line with amendment 10 of Annex 14, Vol. II, the arrangement of the individual lights along the sides of the aiming point – as already illustrated in current Figure F-12 – is proposed to be added explicitly.

In addition, the re-numbering of one reference to a figure, and of Figure F-12 is necessary, based on the proposed addition of a previous figure.

CS HPT-DSN.F.690 Touchdown and lift-off area lighting system

(a) The objective of a touchdown and lift-off area lighting system is to provide illumination of the TLOF and required elements within. For a TLOF located in a FATO, the objective is to provide discernibility, to the pilot on a final approach, of the TLOF and required elements within.

~~(a)~~(b) Applicability:

(1) A TLOF lighting system should be provided at a heliport intended for use at night.

(2) The TLOF lighting system in a FATO~~for a heliport~~ should consist of one or more of the following:

(i) perimeter lights; or

(ii) floodlighting; or

(iii) arrays of segmented point source lighting (ASPSL) or luminescent panel (LP) lighting to identify the TLOF perimeter when (i) and (ii) are not practicable and FATO perimeter lights are available.

(3) When enhanced surface texture cues are required at a TLOF, ASPSL and/or LPs to identify the TDPC and/or floodlighting should be provided for use at night.

~~(b)~~(c) Location:

(1) TLOF perimeter lights should be placed along the edge of the area designated for use as the TLOF or within a distance of 1.5 m from the outer edge.

[…]

(8) The minimum number of ASPSL or LPs on a TLOF should be nine.

(9) The total length of ASPSL or LPs in a pattern should not be less than 50 per cent of the length of the pattern.

(10) There should be an odd number of ASPSL or LPs with a minimum number of three panels on each side of the TLOF, including a panel at each corner.

(11) ASPSL or LPs should be uniformly spaced with a distance between adjacent panel ends of not more than 5 m on each side of the TLOF.

(12) TLOF floodlights, where provided, should be arranged~~located~~ so as to avoid glare to pilots in flight or on the ground, to aerodrome and apron controllers, and~~or~~ to personnel working on the area.

(13) The arrangement and aiming of floodlights should be such that shadows are kept to a minimum.

~~(c)~~(d) Characteristics:

[…]

(3) The chromaticity and luminance of colours of LPs should be in accordance with the specifications in CS ADR-DSN.U.935(f).

[…]

(5) The TLOF perimeter lights located in a FATO should not exceed a height of ~~2~~5 cm and should be inset when a light extending above the surface could endanger helicopter operations.

[…]

(7) The ASPSL and LPs should not extend above the surface by more than 2.5 cm.

(8) The light distribution of the perimeter lights should be as shown in Figure F-~~9~~10, Illustration 5.

(9) The light distribution of the LPs should be as shown in Figure F-~~9~~10, Illustration 6.

[…]

Rationale

In line with previous paragraphs, the objective of the TLOF lighting system – introduced with amendment 9 of Annex 14, Vol. II – is proposed to be included in the CS. Due to this addition the rest of the points are renumbered.

Furthermore, the proposed amendments of the CS are based on both amendments 9 and 10 of Annex 14 Vol. II, and are as follows:

- *The terms 'in a FATO' to be added to point (b)(2) in line with amendment 9 of Annex 14 Vol. II, and the terms 'for a heliport' to be deleted.*
- *The abbreviations 'ASPSL' and 'LP' in point (b)(2)(iii) to be accompanied with their meaning, to improve the clarity of the text.*
- *The term 'perimeter' to be added to the term 'lights' in point (b)(2)(iii), to indicate the kind of lights this provision is about. This addition is also proposed for other provisions in the CS-HPT-DSN.*
- *Point (b)(3) to be transferred from the current GM, after a limited rewording, to provide for the necessary applicability where there is the need for enhanced surface texture cues.*
- *In point (c)(1) the term 'outer' to be added to indicate which side of the edge the perimeter lights should be placed.*
- *In points (c)(8) - (c)(11) the term 'ASPSL' to be added for completeness purposes. This is in line with the text of the Heliport Manual, to which Annex 14 Vol. II refers after the deletion of the related provisions with amendment 10.*
- *In point (c)(12) the terms 'where provided' to be added to indicate that the TLOF floodlights are not mandatory in every case (in line with provisions (b)(2) and (b)(3)). Furthermore, the term 'or' to be substituted with the term 'and', to indicate that all personnel are to be protected against glare and an editorial change to be made.*
- *In point (d)(5) the proposed amendments specify that the provision is applicable to the TLOF perimeter lights that are located in a FATO. Moreover, the maximum height of such lights is proposed to be decreased to 5 cm.*
- *The applicability of point (d)(7) to be extended to ASPSLs.*

Apart from the proposed amendments that are based on the amendments of Annex 14, Vol. II, the following amendments are also proposed:

- *The pilots on the ground and the aerodrome and apron controllers have been added in the list of personnel to be protected from glare caused by TLOF floodlights in point (c)(12). This addition is in line with the corresponding provisions in CS ADR-DSN.M.750 on apron floodlighting, and CS HPT-DSN.F.695 on helicopter stand floodlighting.*
- *In point (d)(3) the exact provision (point (f)) of CS ADR-DSN.U.935 applicable to the chromaticity and luminance of colours of the light panels was added for completeness.*
- *The re-numbering of two references to a figure is necessary, based on the proposed addition of a previous figure.*

GM1 HPT-DSN.F.690 Touchdown and lift-off area lighting system

~~TLOF ASPSL and/or LPs to identify the touchdown marking and/or floodlighting should be provided for use at night when enhanced surface texture cues are required.~~

(a) Where a TLOF is located in a stand, the objective may be met with the use of ambient lighting or stand floodlighting.

(b) Where the TLOF is circular, drift of the helicopter may be difficult to discern by the pilot.

(c) ASPSL and LPs used to designate the TDPM and/or heliport identification marking have been shown to provide enhanced surface texture cues when compared to low-level floodlights. Due to the risk of misalignment, if floodlights are used, there will be a need for them to be checked periodically to ensure they remain within the specifications contained in CS HPT-DSN.F.690. See also point (f) of ADR.OPS.C.015.

(d) Guidance on lighting patterns and characteristics, including the location of lights used to illuminate the heliport identification marking, is contained in the Heliport Manual (Doc 9261).

Rationale

For the deletion of the current text see the rationale of the corresponding CS.

The rest of the points, that are proposed to be added, provide guidance to the heliport operator, in relation to the factors that should be considered regarding TLOF lighting systems. In particular:

- *Point (a) stems from amendment 9 of Annex 14, Vol. II, and states that use could be made of the stand floodlighting or the ambient lighting to meet the objective of the TLOF lighting system, where the TLOF is located in a stand.*
- *Point (b) stems from amendment 10 of Annex 14, Vol. II and is related to point (b)(2) of the CS. It provides information about the implications of a circular TLOF regarding the provision of drift displacement information to the pilots and explains the need for a suitable pattern of lights located on straight lines.*
- *Point (c) stems from amendment 3 of Annex 14, Vol. II. It provides a comparison between the ASPSLs/LPs and the low-level floodlighting, and guidance in the case the latter system is chosen.*

Finally, a reference to the Heliport Manual is proposed to be added as point (d), where further guidance can be found.

CS HPT-DSN.F.695 Helicopter stand floodlighting

(a) The objective of helicopter stand floodlighting is to provide illumination of the stand surface and associated markings to assist the manoeuvring and positioning of a helicopter and facilitation of essential operations around the helicopter.

(b) Applicability: Helicopter stand floodlighting should be provided on a helicopter stand intended to be used at night.

(c) Location: Helicopter stand floodlights should be located so as to provide adequate illumination, with a minimum of glare to the pilots of aircraft in flight and on the ground, aerodrome and apron controllers, and to personnel on the apron. The arrangement and aiming of floodlights should be such that a helicopter stand receives light from two or more directions to minimize shadows.

(d) Characteristics:

(1) The spectral distribution of helicopter stand floodlights should be such that the colours used for aircraft marking related to routine servicing, and for surface and obstacle marking, can be correctly identified.

(2) Horizontal and vertical illuminance should be sufficient to ensure that visual cues are discernible for required manoeuvring and positioning, and essential operations around the helicopter can be performed expeditiously without endangering personnel or equipment.

Rationale

In line with previous paragraphs, the objective of the helicopter stand floodlighting – introduced with amendment 9 of Annex 14, Vol. II – is proposed to be included in the CS.

Moreover, with amendment 9 of Annex 14 Vol. II, a new section was introduced regarding the helicopter stand floodlighting. It is proposed that this is transposed to the present CS, with the following differences:

- *In (c) reference is made to pilots of aircraft in general, instead of only to helicopter pilots, and to aerodrome and apron controllers, in line with the corresponding text of Annex 14 Vol. I. These additions were considered important since the scope of the present CS-HPT-DSN includes (exclusively) heliports in aerodromes.*
- *In (d)(1) reference is made also to colours used for aircraft marking related to routine servicing. This is again in line with the corresponding text of Annex 14 Vol. I.*

GM1 HPT-DSN.F.695 Helicopter stand floodlighting

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CS HPT-DSN.F.700 ~~Taxiway~~Taxi-route lights

The specifications of CS ADR-DSN.M.706, CS ADR-DSN.M.710, CS ADR-DSN.M.715, ~~and~~ CS ADR-DSN.M.720, CS ADR-DSN.M.730, CS ADR-DSN.M.735 and CS ADR-DSN.M.745 are applicable to ~~taxiways~~taxi-routes intended for ~~ground~~ the taxiing of helicopters.

Rationale

Considering that with amendment 9 of Annex 14 Vol. II the term 'taxiway' is related to ground taxiing only, the title of the provision is proposed to be amended to 'taxi-route' to cover also the case of 'air-taxiing'. The above applied also to the same proposed amendment within the text of the provision and for the proposed deletion of the term 'ground'.

Furthermore, for a helicopter located at an aerodrome, it is not only taxiway centreline and edge lights that might be required. IFR equipped helicopters could operate in runway visual range conditions less than a value of 550 m from a helicopter stand to a runway (and vice versa) through a helicopter taxi-route. In such a case also runway guard lights (RGL) or even stop bars could be required. RGL might be necessary also for an RVR value of less than 1200 m, where the traffic density is heavy. An additional consideration is the provision of intermediate holding position lights where there is no need for stop-and-go signals. Finally, where it has been considered as necessary to install runway status lights, this should also cover the case of helicopter taxi-routes linked to a runway.

The reference to taxiway centreline and edge lights only – although in line with Annex 14 Vol. II – is therefore considered to be misleading and it is proposed that references to the CS related to runway status lights, stop bars, intermediate holding position lights and runway guard lights are explicitly added to the present provision.

GM1 HPT-DSN.F.700 ~~Taxiway~~Taxi-route lights

~~Intentionally left blank~~

Where a road intersects a helicopter taxi-route and where operationally required, a suitable holding position light may be located adjacent to the road-holding position marking 1.5 m (±0.5 m) from one edge of the road, i.e. left or right as appropriate to the local road traffic regulations.

Rationale

Similarly to the corresponding CS, the GM1 ADR-DSN.M.770 is proposed to be applicable to the infrastructure that is intended to be used by helicopters. In contrast to the CS, however, the provision is proposed to be transferred here explicitly, so that an amendment can be made to the term from 'taxiway' to 'taxi-route', since the use of the term 'taxiway' would not cover the case of an air taxi-route not collocated with a taxiway. The provision is proposed to be transferred as a GM, since the corresponding text in the CS-ADR-DSN is also a GM.

CS HPT-DSN.F.705 Signs

(a) Except as specified in paragraph (b) below, the specifications contained in Chapter N of CS-ADR-DSN are equally applicable to the infrastructure intended to be used by helicopters.

(b) Information signs should wherever practicable, be located on the right-hand side of the taxi-route, except for runway exit signs, which should be located on the same side of the runway as the exit is located (i.e. left or right).

Rationale

Similarly to lights, the need of information and mandatory instruction signs, especially at complex taxi-route/taxiway intersections and runway holding points, should be considered. It is therefore proposed to add a reference to Chapter N 'Visual Aids for Navigation (Signs)' of CS-ADR-DSN. Point (b) is proposed to be included since the position of the captain is located on the right side of the helicopter, and the signs will be better visible from the cockpit.

GM1 HPT-DSN.F.705 Signs

The infrastructure that is intended to be used by helicopters includes the taxi-routes that are not collocated with a taxiway, i.e. are intended only for air taxiing of helicopters. In applying CS HPT-DSN.F.705 it is therefore necessary to consider that the term 'taxiway' included in Chapter N of CS-ADR-DSN, also includes the case of taxi-routes.

Rationale

The text of the GM is proposed to be added, so that it is clear that the applicability of the corresponding provisions in CS-ADR-DSN also includes taxi-routes not collocated with taxiways.

CS HPT-DSN.F.710 Visual aids for denoting obstacles

(a) The objective of obstacle floodlighting is to highlight the shape and location of obstacles in the vicinity of the heliport, to assist a pilot flying at night to avoid all obstacles by a safe margin.

(b) Obstacles should be marked and lit in accordance with Chapter Q of the CS-ADR-DSN~~CS ADR-DSN.Q.840, CS ADR-DSN.Q.845 and CS ADR-DSN.Q.850~~.

Rationale

The objective of the obstacle floodlighting, that was included in Annex 14 Vol. II with amendment 10, is proposed to be added in the present GM as point (a).

The existing text of the CS is therefore proposed to be numbered as point (b) and to be amended taking into account that:

- *with issue 5 of the CS-ADR-DSN, the CS ADR-DSN.Q.850 was deleted, and*
- *the rest provisions included in the CS do not cover all the possibilities of the marking and lighting of obstacles and further objects of operational interest.*

It is thus proposed that a reference to the whole of Chapter Q of the CS-ADR-DSN is included.

GM1 HPT-DSN.F.710 Visual aids for denoting obstacles

(a) General: If it is not possible to display obstacle lights on obstacles at or in the vicinity of a heliport intended for use at night, the obstacles should be floodlit.

(b) Location: Obstacle floodlights should be arranged so as to illuminate the entire obstacle and, as far as practicable, in a manner so as not to dazzle ~~helicopter~~ pilots.

[…]

Rationale

It is proposed that a reference to the obstacles in the vicinity of the heliports is added to the provision, since they also represent a hazard to helicopter operations and need to be floodlit, in case it is not possible to display obstacle lights.

Moreover, the term 'helicopter' is proposed to be deleted in point (b), since the requirement for the floodlights not to dazzle pilots is important to pilots of all kinds of aircraft.