



Exploration & Production

GENERAL SPECIFICATION

Logistics and Operational Support

GS EP LSO 115

Helideck specifications

01	01/2012	Documentation, NUI's, weather equipment
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1. Scope

This general specification summarizes the general guidance on the criteria to be applied for the design of helicopter offshore landing areas.

Those criteria, related to fixed and mobile installations, are based on the helicopter landing areas standards as defined in [ICAO Annex 14 Vol 1](#) and [ICAO Annex 14 Vol 2](#). It is not intended to replace the [GS EP STR 901](#), but more to summarize the specifications for operational purpose. Additional mandatory criteria are given in relation with others related publications from North sea regulations, [CAA UK - CAP 437](#).

Additional recommendations are available in the [UKOOA OP004](#).

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
ICAO Annex 14 Vol 1	Aerodrome Design and Operations
ICAO Annex 14 Vol 2	Heliports

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
CAA UK - CAP 437	Offshore Helicopter Landing Areas – Guidance on Standards

Codes

Reference	Title
Not applicable	



Other documents

Reference	Title
UKOOA OP004	Guidelines for Management of Offshore Helideck Operations
UKOOA Addendum 12	Helideck and System Inspection Checklist - Perimeter safety net
HSE Operations Notices 67	Health and Safety Executive : Offshore Helideck Design Guidelines
OGP Report n° 390	Aircraft Management Guidelines
OGP Report n° 322	Offshore Helideck Review Checklist

Total General Specifications

Reference	Title
GS EP STR 901	Design rules and construction standards for ancillary structures of offshore installations
GS EP GEO 505	Monitoring of Metocean Conditions for Offshore Units
GS EP LSO 110	Environmental effects considerations for helidecks

3. General

- The development of helicopter activities, especially on offshore installations, has led to the definition by the ICAO (International Civil Aviation Organization) of standards and recommended practices for the construction or operation of heliports or helidecks.
- The ICAO (which encompasses almost all countries with 188 Contracting States) has therefore published a series of texts on which national regulations are to be based. ICAO standards shall be considered as regulatory minima below which the Contracting States are not to descend unless the Organization is notified of this.
- Some contracting States have published guides or technical instructions for the attention of their domestic operators. As far as heliport or helideck construction standards are concerned, we can mention for example:
 - ◇ CAA UK - CAP 437 (Ed 6th Amdt 1)
 - ◇ OGP Report n° 322.

These documents are based on ICAO Annex 14 Vol 1 and ICAO Annex 14 Vol 2, which are the reference documents.

- The TOTAL Group operates installations located in several countries and shall meet the requirements of the various local regulations.
- The appended documents describe the essential points to be considered to design a helideck. These recommendations not only comply with ICAO Annex 14 Vol 2 standards, but also take account of certain adjustments taken from national regulations (CAA UK -

CAP 437, in particular), the main aim being the quest for safety combined with maximum flexibility of operation.

- For the definition, layout and construction of a helideck on an offshore installation (as well as for its subsequent operation), several aspects therefore need to be considered, some as early as the preliminary design stage.

On installations built before the **ICAO Annex 14 Vol 2** standards were published, a number of non conformities must be accepted, especially on construction problems (obstacle sectors, minimum helideck size, etc.). However, no additional obstacles (radio antennas, for example) must be allowed to be erected in proximity to these helidecks as this would simply aggravate the situation. Special operational constraints will often be laid down to offset such non conformities; ***in that case derogation will have to be submitted to LSO Aviation.***

3.1 Documentation

Documentation attached to the helideck operations shall be made available when relevant:

- Copy of latest helideck and / or vessel drawings showing all necessary helideck markings, dimensions and elevations
- Helideck certification and approval
- Helideck surface friction test certificate
- Latest calibration certificates:
 - Meteorological instruments. It should include:
 - . Wind speed, direction indicator for all sets: fixed and hand held
 - . Barometer precision / twin altimeter
 - . Pitch, Roll & heave equipment.
 - Weighing scale equipments for passengers, baggage's & cargo.
- Latest certificate for fire fighting equipment
 - Foam system maintenance & testing
 - Foam type & quantity
 - Foam test certificate (concentrate & produced)
- Helideck procedure manuals including:
 - Helideck operation
 - HLO
 - Fire fighting
 - Passenger's handling
 - Fuel procedures
 - Weather & adverse weather procedures
 - Special procedures for unattended installations



- Emergency Response Plan (ERP) with bridging documents (Rig owner, heli operator, ...); It shall include but not limited to:
 - . Crash on the deck
 - . Crash near the deck
 - . Ditching
 - . Overdue aircraft
- Helideck personnel training records and certificates
 - HLO
 - HDA
 - Firemen
 - Radio operator
- Dangerous goods training
- Others
 - Radio log
 - ERP exercises log
 - Pre landing check list

3.2 Environmental effects considerations for helidecks

Refer to [GS EP LSO 110](#) and to [HSE Operations Notices 67](#), chapter 10.

3.3 Location

The helideck location must take account of the 210° obstacle-free sector requirement for approach. Special attention will be given to the effects of turbulence generated by surrounding structures. Positioning the helideck in the vicinity of exhaust fumes will be avoided. A turbulent environment can result in significant limitations on use (payload, reduced approach sector, etc.).

Where possible, position the helideck on one of the raised points of the structure and orient the preferred approach sector in the direction of the prevailing wind.

3.4 Dimensions

In the case of a helideck construction planned for a long service life (20 years or more), the only recommendation specific to the Total Group on top of these [ICAO Annex 14 Vol 2](#) standards is to ***increase the minimum size of the helidecks planned for regular use by 15%***. The purpose of this is to provide a small margin to allow equipment (wire line, for example) to be stored on the helideck (experience shows that this is always useful) or, possibly, to have the opportunity later of using a larger helicopter when the fleet is renewed.

The size of the helideck will depend on the type of helicopter to be used. Helicopters are grouped into three families according to maximum take-off weight and the number of passenger seats:

- light helicopters,



- medium helicopters,
- heavy helicopters.

It is preferable to take account of a category of aircraft rather than concentrate on a specific model. Helicopter manufacturers renew their range approximately every fifteen years and a particular type of aircraft may be found to be unavailable from certain operators.

Helicopter data's

Calculation is based on minimum value:										08/04/10
HD (Helideck Dimension) = OL (Overall Length of helicopter).										
TYPE	OL (m)	0.83HD (m)	0.62HD (m)	0.05HD (m)	Max weight	"D" Value	"I" Value	Fifi Cat	Landing net size	
Agusta - A 109	13,05	10,83	8,09	0,65	2720 kg	13 m	2,8 t	H1	Small	
Agusta - AW 139	16,65	13,82	10,32	0,83	6800 kg	17 m	6,8 t	H2	Medium	
Bell - Bell 212	17,41	14,45	10,79	0,87	5080 kg	17 m	5,1 t	H2	Not required	
Bell - Bell 214ST	18,80	15,60	11,66	0,94	7940 kg	19 m	8 t	H2	Medium	
Bell - Bell 412	17,10	14,19	10,60	0,86	5398 kg	17 m	5,4 t	H2	Medium	
Bell - Bell 430	15,39	12,77	9,54	0,77	4082 kg	15 m	4,1 t	H2		
Eurocopter - AS 332 L1	18,73	15,55	11,61	0,94	8600 kg	19 m	8,6 t	H2	Medium	
Eurocopter - AS 332 L2	19,50	16,19	12,09	0,98	9300 kg	20 m	9,3 t	H2	Medium	
Eurocopter - AS 355 F2	12,99	10,78	8,05	0,65	2540 kg	13 m	2,6 t	H1		
Eurocopter - AS 355 N	12,94	10,74	8,02	0,65	2540 kg	13 m	2,6 t	H1		
Eurocopter - AS 355 SP	12,94	10,74	8,02	0,65	2600 kg	13 m	2,6 t	H1	Not required	
Eurocopter - AS 365 N	13,46	11,17	8,35	0,67	4000 kg	13 m	4 t	H1	Small	
Eurocopter - AS 365 N2	13,69	11,36	8,49	0,68	4250 kg	14 m	4,3 t	H1	Small	
Eurocopter - AS 365 N3	13,73	11,40	8,51	0,69	4300 kg	14 m	4,3 t	H1	Small	
Eurocopter - BK 117	13,00	10,79	8,06	0,65	3450 kg	13 m	3,5 t	H1	Not required	
Eurocopter - BO 105	11,86	9,84	7,35	0,59	2400 kg	12 m	2,4 t	H1	Not required	
Eurocopter - EC 135	12,10	10,04	7,50	0,61	2935 kg	12 m	3 t	H1		
Eurocopter - EC 145	13,03	10,81	8,08	0,65	3585 kg	13 m	3,6 t	H1	Not required	
Eurocopter - EC 155 B1	14,30	11,87	8,87	0,72	4920 kg	14 m	5 t	H1	Medium	
Eurocopter - EC 225	19,50	16,19	12,09	0,98	11000 kg	20 m	11 t	H2	Medium	
Eurocopter - SA 330 J	18,22	15,12	11,30	0,91	7400 kg	18 m	7,4 t	H2	Medium	
Eurocopter - SA 365 C2/C3	13,32	11,06	8,26	0,67	3500 kg	13 m	3,5 t	H1	Small	
MD900	11,84	9,83	7,34	0,59	2720 kg	12 m	2,8 t	H1		
Sikorsky - S 61 N	22,10	18,34	13,70	1,11	9300 kg	22 m	9,3 t	H2	Large	
Sikorsky - S 76 A/A++	16,00	13,28	9,92	0,80	4500 kg	16 m	4,9 t	H2	Medium	
Sikorsky - S 76 C/C+/C++	16,00	13,28	9,92	0,80	5300 kg	16 m	5,3 t	H2	Medium	
Sikorsky - S 92*	20,88	17,33	12,95	1,04	12020 kg*	21 m	12 t*	H2	Large	
Westland - EH 101	22,80	18,92	14,14	1,14	14600 kg	23 m	14,6 t	H2	Large	

* possible upgrade up to 12,8 t

3.5 Structural Strength

Ref: [ICAO Annex 14 Vol 2](#) (Chapter 3.1) - [CAA UK - CAP 437](#) (Amdt 1 Chapter 3.4.1 & 3.5.1)

The helideck should be designed for the heaviest and largest helicopter using the facility. Consideration in the design must also be given to other types of loading (personnel, freight, fuelling equipment, wire-line material, etc.). The helicopter landing area should be designed to withstand all stresses that result from a helicopter landing.

3.5.1 Loads: helicopter landing

Dynamic load due to impact landing:

This should cover both a heavy normal landing and an emergency landing. For the former, an impact load of $1.5 \times \text{MTOM}$ of the helicopter should be used

Sympathetic response of landing platform:

It is recommended that a structural response factor of 1.3 should be used.

Overall superimposed load, dead load and wind load.

To allow for snow, personnel etc. in addition to wheel loads, an allowance of 0.5 kN/m^2 should be added over the whole area of the helideck.

Lateral load on landing platform supports.

The landing platform and its supports should be designed to resist concentrated horizontal imposed loads equivalent to $0.5 \times \text{MTOM}$ of the helicopter, distributed between the undercarriages in proportion to the applied vertical loading in the direction which will produce the most severe loading on the element being considered.

Dead load of structural members.

This is the normal gravity load on the element being considered.

Wind loading.

Wind loading should be allowed for in the design of the platform. This should be applied in the direction which, together with the imposed lateral loading, will produce the most severe loading condition on each element

Punching shear.

A check should be made for the punching shear from a wheel of the landing gear with a contact area of $65 \times 103 \text{ mm}^2$ acting in any probable location. Particular attention to detailing should be taken at the junction of the supports and the platform deck.

3.5.2 Loads: helicopter at rest

The helideck should be designed to withstand all the applied forces that could result from a helicopter at rest; the following loads should be taken into account:

**Imposed load from helicopter at rest.**

All areas of the helideck accessible to a helicopter, including any separate parking or run-off area, should be designed to resist an imposed load equal to the MTOM of the helicopter. This load should be distributed between all the landing gear. It should be applied in any position on the helideck so as to produce the most severe loading on each element considered.

Overall superimposed load, dead load and wind load.

The values for these loads are the same as given in paragraph 4.1 c), e) and f) above and should be considered to act simultaneously in combination with a) above. Consideration should also be given to the additional wind loading from any parked or secured helicopter.

Acceleration forces and other dynamic amplification forces.

The effect of these forces, arising from the predicted motions of mobile installations and vessels, in the appropriate environmental conditions corresponding to a 10-year return period, should be considered.

The maximum allowable weight limit must appear on the helideck (see Markings).

3.6 Protection from Obstacles

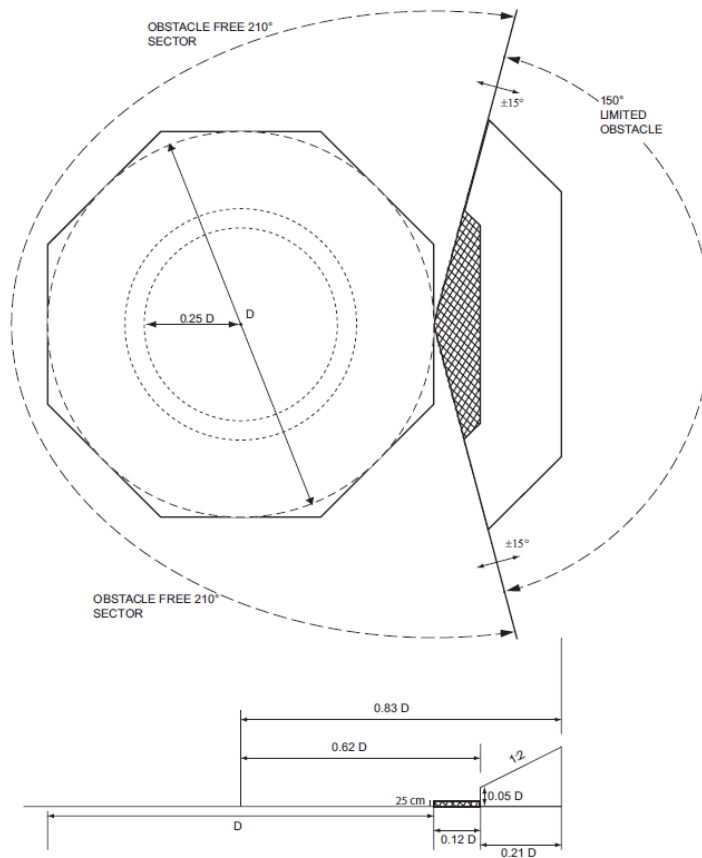
Ref: [ICAO Annex 14 Vol 2](#) (Chapter 4.1.24/25 & 4.2.12/18) - [CAA UK - CAP 437](#) (Amdt 1 Chapter 3.6/9)

The most important point concerns distances in relation to obstacles. Indeed, once the helideck is built, it is the most difficult point to modify. As a general rule, every effort should be made to clear the helideck surroundings of various obstacles as far as is possible, or at least to group together these obstacles in as small an angular sector as possible. The helicopter must always be able to hover over the helideck with a sufficient margin in relation to these obstacles.

A protection sector will extend below the helideck, centred on the centre of the FATO and over an arc of 180°. The falling gradient will have a ratio of one horizontal unit for five vertical units.

3.6.1 210° Obstacle Free Sector (OFS) [CAA UK - CAP 437 Amdt 1](#)

No objects above 25 cm are permitted in the first (hatched area in Figure 1) segment of the LOS. The first segment extends out to 0.62D from the centre of the D-circle, or 0.12D from the landing area perimeter marking. The second segment of the LOS, in which no obstacles are permitted to penetrate, is a rising 1:2 slope originating at a height of 0.05D above the helideck surface and extending out to 0.83D from the centre of the D-circle.



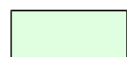
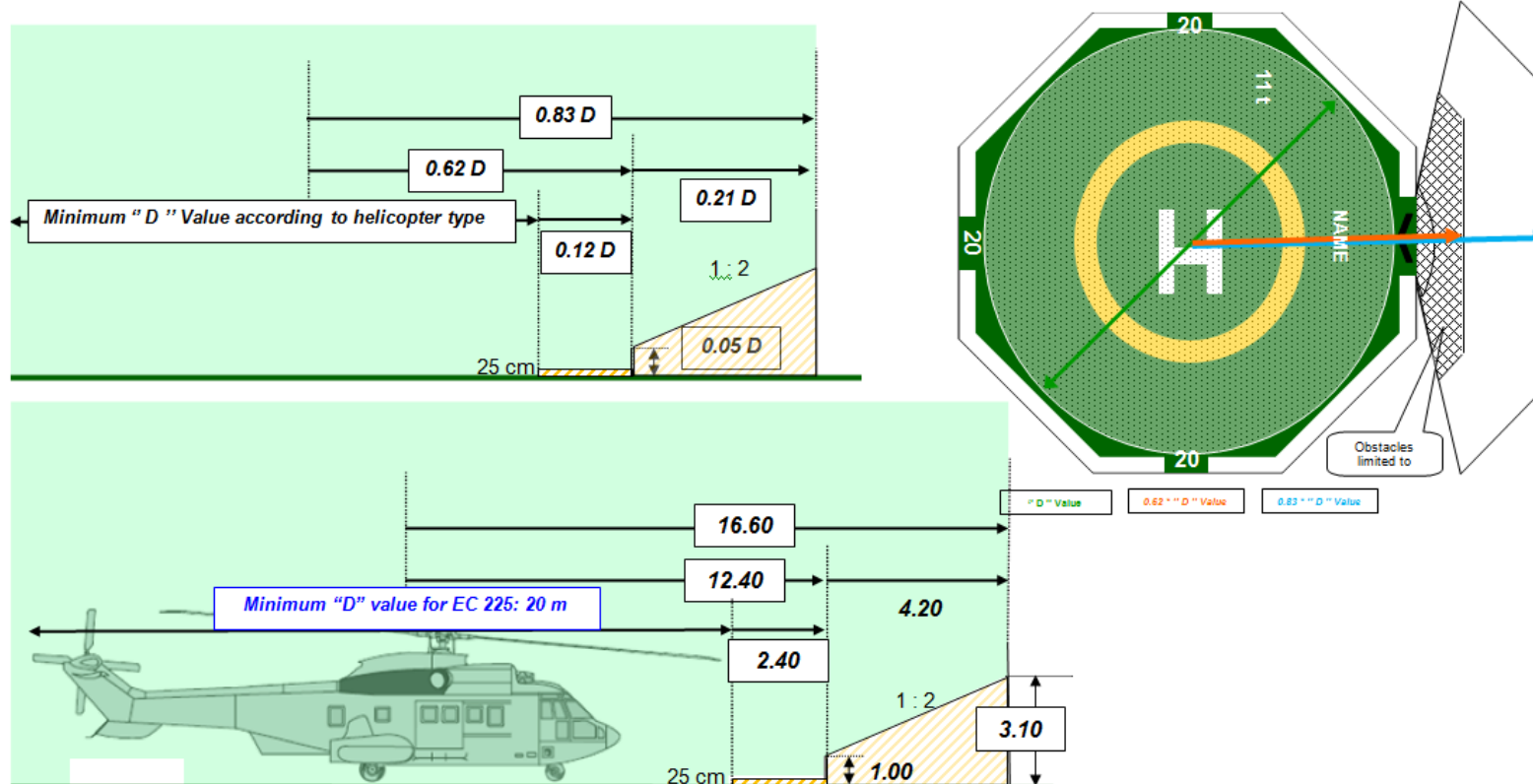
Obstacle Limitation (Single Main Rotor and Side by Side Main Rotor Helicopters)
showing position of Touchdown/Positioning Marking circle

For helicopters operated in Performance Class 1 or 2 the horizontal extent of this distance from the helideck will be based upon the one-engine inoperative capability of the helicopter type to be used. In consideration of the above, only the following items may exceed the height of the landing area, but should not do so by more than 25 centimetres:

- The guttering
- The lighting required by Chapter 3.10;
- The foam monitors (where provided); and
- Those handrails and other items (e.g. EXIT sign) associated with the landing area which are incapable of complete retraction or lowering for helicopter operations.

Example for an EC 225

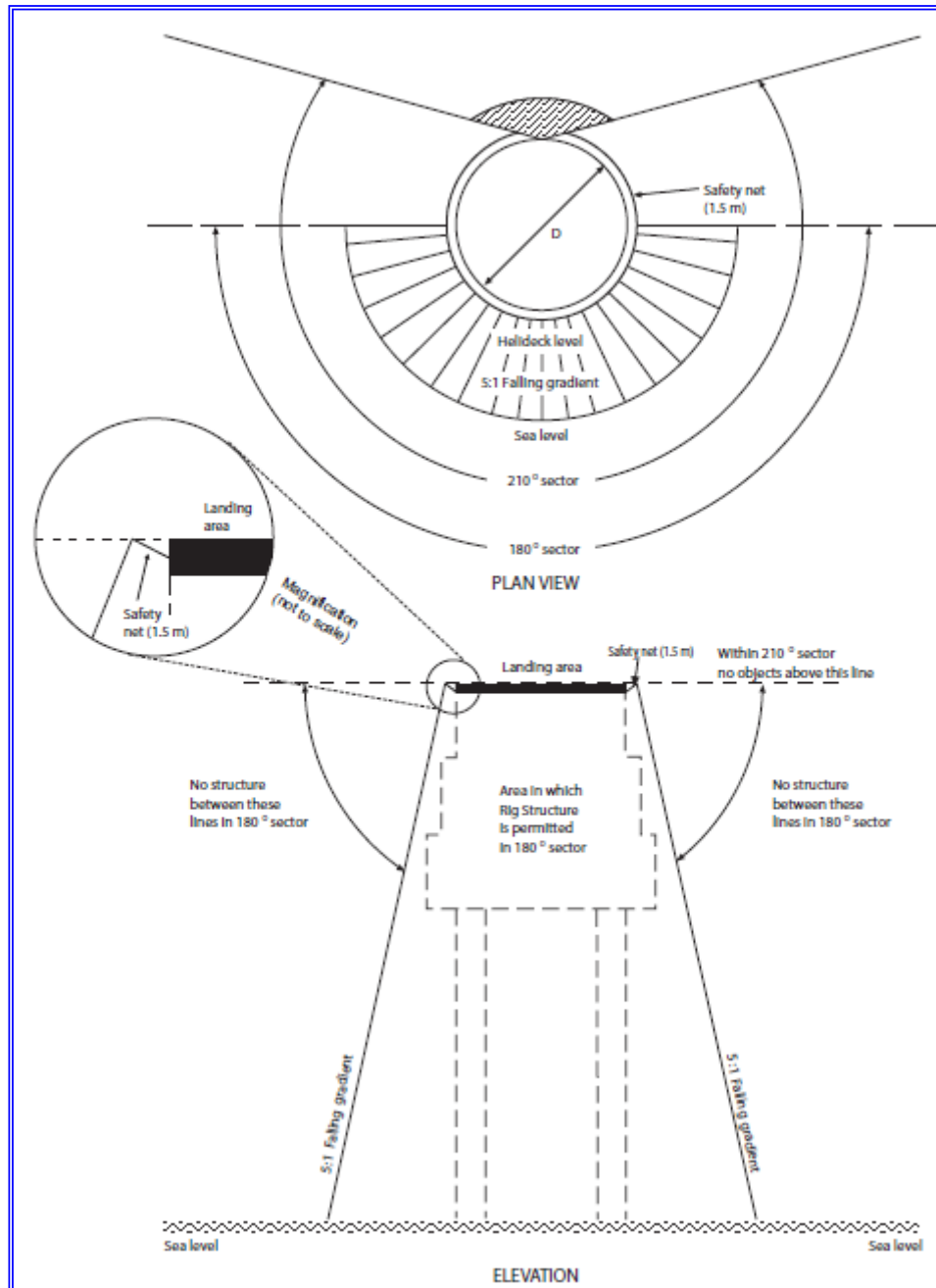
Eurocopter - EC 225		OL (m)	0.83HD (m)	0.62HD (m)	0.05HD (m)	0,12 HD (m)	0,21 HD (m)	1:2 (m)	Max weight	"D" Value	"t" Value
		19,5	16,60	12,40	1,00	2,40	4,20	3,10	11000 kg	20m	11 t



The green envelop shall be free of obstacle; No obstacle higher than 2,5 cm within the "D" Value area.

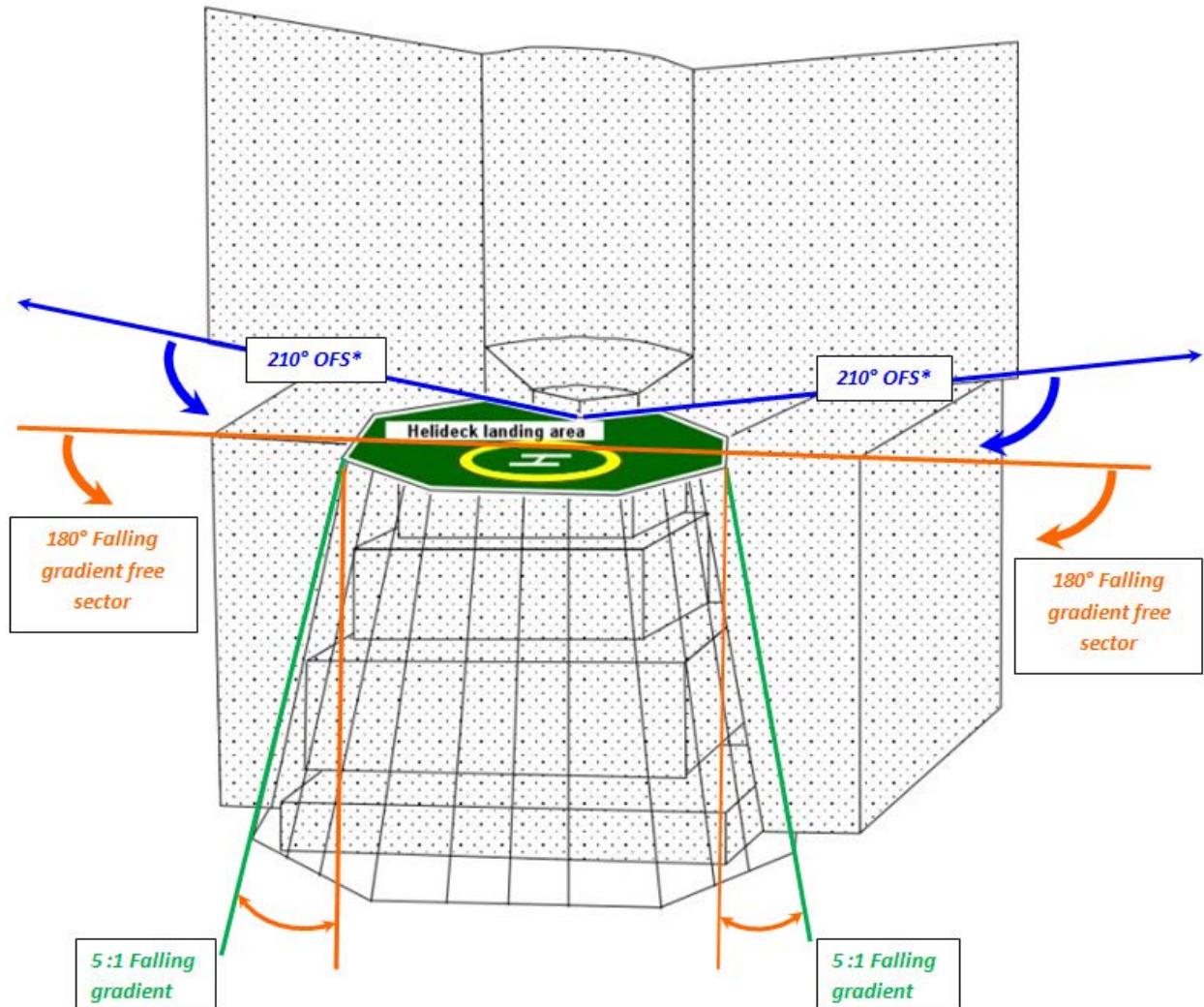
3.6.2 180° / 5:1 falling gradient

It is necessary to consider the possibility of helicopter loss of height due to a power unit failure during the latter stages of the approach or early stages of take-off. Accordingly, a clear zone should be provided below landing area level on all fixed and mobile installations between the helideck and the sea.



Obstacle Free Areas – Below Landing Area Level (for all types of helicopters)

3.6.3 3 "D" Overview of Obstacles Free Sectors



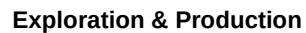
* For helicopters operated in Performance Class 1 or 2 the horizontal extent of this distance from the helideck will be based upon the one-engine inoperative capability of the helicopter type to be used.

Note : It is accepted that, at times, short-term infringement to obstacle-protected surfaces cannot be avoided when, for example, supply/support vessels work close to an installation. It may be impractical to assess such situations within the time available.

However, the helicopter operator may need to apply operational limitations in such circumstances. It is therefore important for helicopter crews to be kept informed of all temporary infringements.

3.7 Helideck Markings

Ref: CAA UK - CAP 437 Amdt 1 Chapter 4.2

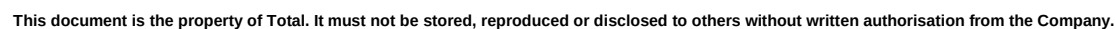


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Note 1: A touchdown/positioning marking shall be located so that when the pilot's seat is over the marking, the undercarriage will be inside the load-bearing area, and all parts of the helicopter will be clear of any obstacle by a safe margin.

On a helideck the centre of the touchdown marking shall be located at the centre of the FATO, except that the marking may be offset away from the origin of the obstacle-free sector by no more than $0.1 D$ where an aeronautical study indicates such offsetting to be necessary and that a marking so offset would not adversely affect the safety.

Note 2: It is not considered appropriate to offset a touchdown marking on a heliport located on the bow of a vessel, or for any helideck where the D -value is 16 m or less.

Colours should conform with the following BS 381C (1996) standard or the equivalent BS 4800 colour.

a) RED

BS 381C: 537 (Signal Red)

BS 4800: 04.E.53 (Poppy)

b) YELLOW

BS 381C: 309 (Canary Yellow)

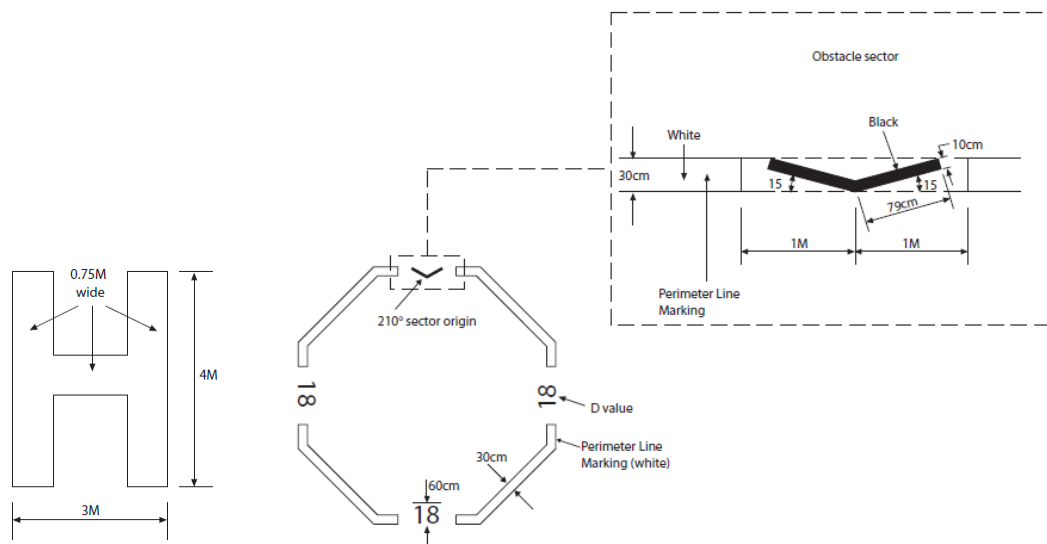
BS 4800: 10.E.53 (Sunflower Yellow)

c) DARK GREEN

BS 381C: 267 (Deep Chrome Green)

BS 4800: 14.C.39 (Holly Green)

3.7.1 "H" & Chevron dimensions



3.7.2 Helideck Surface

Ref: CAA UK - CAP 437 Amdt 1 3.7.1/2

The helideck surface will be coated with a non-slip material including all markings.

A peripheral drainage system shall collect and eliminate rainwater and, in the event of a crash, direct any fuel spills to a safe place. Where the helideck is located above accommodations, the drainage system must be designed to avoid these areas. It is important to ensure that the helideck is properly sealed to prevent the spread of fire to the entire installation.

3.7.3 Landing Safety Net

Ref: [CAA UK - CAP 437](#) (Amdt 1 Chapter 3.7.3/8)

3.7.3.1 General

Helideck landing nets should be fitted on all helidecks on offshore installations and vessels

Tautly-stretched rope netting should be provided to aid the landing of helicopters with wheeled undercarriages in adverse weather conditions. Netting must normally be fitted over the touchdown area of mobile helidecks.

The rope shall be 20 mm diameter sisal, with a maximum mesh size of 200 mm. It should be secured every 1.5 metres round the landing area perimeter and tensioned to at least 2225 N.

Tensioning to a specific value may be impractical offshore. As a rule of thumb, it should not be possible to raise any part of the net by more than approximately 250 mm above the helideck surface when applying a vigorous vertical pull by hand.

Helideck Netting size (refer to helicopter dimensions table for net size)

Small	9 metres by 9 metres
Medium	12 metres by 12 metres
Large	15 metres by 15 metres

NOTE: Some helideck nets may be circular rather than square.



3.7.3.2 Removal of landing nets:

Normally Attended Installations (NAIs):

Where no significant movement due to environmental conditions occurs, provided the helideck can be shown to achieve an average surface friction value of not less than 0.65 determined by an acceptable test method, the helideck landing net may be removed. The installation operator should ensure thereafter that the helideck is kept free from oil, grease, ice, snow, excessive surface water or any other contaminant (particularly guano) that could degrade surface friction.



Assurance should be provided to the helicopter operator that procedures are in place for elimination and removal of contaminants prior to helicopter movements.

Normally Unattended Installations (NUIs):

Consideration to remove landing nets on NUIs may only be given if procedures are in place which guarantees that the helideck will remain clear of contaminants such that there is no risk of helideck markings and visual cues being compromised or friction properties reduced.

Mobile Installation:

Landing nets on mobile installations have generally, in the absence of any research, been regarded as essential. However, it may be possible to present a safety case for specific installations in the aim to obtain derogation from LSO Air.

Case of landing net removal:

In the case of skidded helicopters, the fitting of nets is subject to the specified requirements of the helicopter operator. Nets may constitute a particularly serious hazard to skidded helicopters.

There are, however, others operational disadvantages with installing helideck nets, such as passenger trip hazards, obscuring deck markings, and restricting the clearance of spilt fuel.

On the other hand, the appearance of the three-dimensional mesh from some distance above, when landing, provides flight crews with a good reference (visual cue) of the height above the helideck and the closure rate, particularly at night when many other visual clues are absent.

An assessment may be required in order to demonstrate that the risks are acceptable.

Removing the helideck net shall only be considered if the friction surface achieves average surface friction values (see CAP 437) using an approved testing device.

After removing a landing net, the surface friction shall be subject to routine re-testing; the periodicity will depend on the results achieved from previous friction tests (see [CAA UK - CAP 437](#) Amdt 1 Chapter 3.7.5 / 3.7.7 Friction Requirements for Landing Area Net Removal).

Friction Requirements for Landing Area Net Removal

Average surface friction value	Maximum period between tests
0.85 and above (Recognised Friction Surface) ¹	36 months
0.7 to 0.84	12 months
0.65 to 0.69	6 months
Less than 0.65 ¹	Net to be retained

1. Refer to CAA Paper 98002

Note: When a net is installed, particular attention should be paid (HLO and crew), when the helicopter is lifting-off to hover, to ensure that no part of the helicopter (for example, tail skid of a SA 365 or any part of the landing gear) has been caught in a net mesh.



3.8 Tie-Down points

Ref CAA UK - CAP 437 (Amdt 1 Chapter 3.8.1) GS EP STR 901 (Chapter 3.4.4)

Sufficient flush fitting (when not in use) tie-down points should be provided for securing the maximum sized helicopter for which the helideck is designed. They should be so located and be of such strength and construction to secure the helicopter when subjected to weather conditions pertinent to the installation design considerations. They should also take into account, where significant, the inertial forces resulting from the movement of floating units.

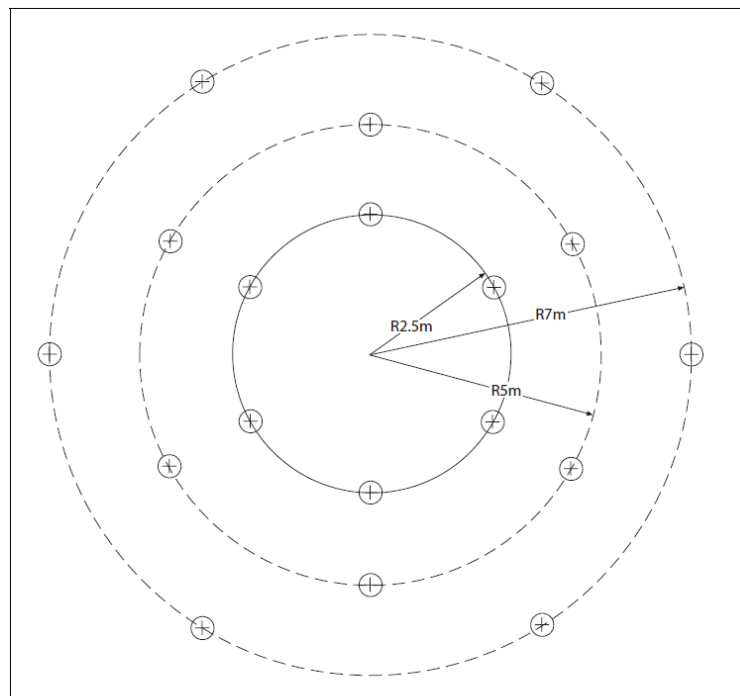


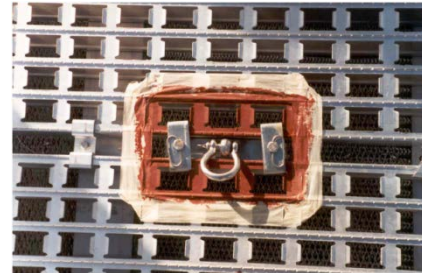
Figure 3 Example of Suitable Tie-down Configuration

- NOTES:**
1. The tie-down configuration should be based on the centre of the TD/PM Circle.
 2. Additional tie-downs will be required in a parking area.
 3. The outer circle is not required for D-values of less than 22.2 m.

The maximum bar diameter of the tie-down point should be 22 mm in order to match the strop hook dimension of the tie-down strops carried in most offshore helicopters.



Recessed box tie down fitting



Semi recessed box tie down fitting

Note: Every landing area should be equipped with adequate surface drainage arrangements and a free-flowing collection system that will quickly and safely direct any rainwater and/or fuel spillage and/or fire fighting media away from the helideck surface to a safe place.(drained tie down points)

Tie-down strops: Often, the helicopter operator provides this equipment and the tie-down strops are carried as part of the aircraft role equipment. When this equipment is to be provided by the Installation Operator or vessel owner, purpose made tie-down strops should be specified. A minimum of 6 is recommended.

3.9 Access Points

Ref: [CAA UK - CAP 437](#) (Amdt 1 Chapter 3.10)

There must be a minimum of two access/egress routes to the helideck. The arrangements should be optimised to ensure that, in the event of an accident or incident on the helideck, personnel will be able to escape upwind of the landing area.

Where handrails associated with helideck access/escape points exceed the height limitations given they should be retractable, collapsible or removable.

Floor markings may be used to indicate passenger routes.

3.10 Perimeter Safety Net

Ref: [CAA UK - CAP 437](#) (Amdt 1 Chapter 3.9), [UKOOA Addendum 12](#) (Chapter 9, Perimeter safety net), [GS EP STR 901](#) (Chapter 3.7.5 & 4.1).

3.10.1 Netting system

Safety nets for personnel protection should be installed around the landing area except where adequate structural protection against a fall exists. The netting used should be of a flexible nature, with the inboard edge fastened just below the edge of the helicopter landing deck. The net itself should extend 1.5 metres in the horizontal plane and be arranged so that the outboard edge does not exceed the level of the landing area and angled so that it has an upward and outward slope of approximately 10°. **The top of the mesh shall not exceed the landing level.**

A safety net support assembly and its fixings to the helideck primary structure should be designed to withstand the static load of the whole support structure, the netting system and any



attached appendages (e.g. NDB antenna) plus a 125 kg load imposed on any section of the netting system (equivalent to a body falling onto the net from helideck level).. The net must not act as a trampoline producing a “bounce” effect; a “hammock” effect is ideal.

Ideally, a perimeter safety net system should be designed so that it is divided into manageable sections that can be easily retracted or lifted inboard (hinged or removable) to permit maintenance and panel replacement from the helideck surface, without requiring external access (e.g. scaffolding or abseilers).

For existing netting systems on offshore installations, at the first opportunity duty holders should consider the above criteria and apply an “interim” component life having carried out a thorough physical condition inspection and obtained suitable data (e.g. representative net sample testing) to verify the findings. The age and specification of existing netting systems should be taken fully into account when concluding that an “interim” life can safely be applied.

3.10.2 Materiel selection

Netting materials should be purchased against a recognised industry standard (e.g. BS, EN, ISO, Mil Spec standards, etc) and such that it's anticipated rate of deterioration can be assessed and predicted against a minimum allowable residual strength.

Preference will be given to galvanized mesh. It shall be galvanized after it is welded to the receiving structure.

“Plastic garden” material is not recommended due to hidden corrosion.

3.10.3 Testing

General

It is necessary to load test the constructed perimeter safety net system to ensure design and construction integrity.

Ideally, the initial test should be carried out on an identical test panel, not a section that is to be installed on an operational helideck. During helideck inspections, often the date of the last drop test cannot be confirmed. A copy of the test document should be kept readily available on the installation / vessel.

The test can be achieved using a sandbag of suitable weight released from a suspension point above the panel.

Offshore Testing

Dynamic testing of perimeter safety nets should not be undertaken offshore.

Duty Holders may wish to consider installing sacrificial panels of selected netting material into the perimeter net system that can easily be removed periodically (say, annually) to permit onshore testing. When removed, sacrificial panels should not alter effectiveness of the main panel restraint system.

Onshore Testing

The perimeter netting, while in service, should be capable of meeting a minimum standard of performance. A test is therefore required to show the net initially meets (or exceeds) that standard, and, a method by which periodic testing is able to show that the net continues to meet (or exceed) the desired standard of performance

Testing the netting materials (e.g. pull test for polypropylene rope and other fibres or other appropriate test methods for wire mesh systems) and representative panels of safety netting (e.g. tests to include the netting fixing systems) should be conducted by an approved testing using an approved test method for the specified material (e.g. BS, EN, ISO, Mil Spec standards, etc). A description of the material specification, testing protocol and qualification should accompany the results of each series of tests that have been performed.

Irrespective of the previous drop testing results achieved on existing polypropylene perimeter safety nets that have been in service for more than one year, if the condition of the net materials and net fixing systems cannot be properly verified in accordance with this guidance then arrangements should immediately be put in place to replace the helideck perimeter netting system.

Similarly, existing perimeter safety nets constructed from materials other than polypropylene (e.g. wire meshes) and the net fixing systems should be subject to close visual examination appropriate to the materials of construction. If the condition of net materials cannot be properly verified in accordance with this guidance then arrangements should immediately be put in place to replace the helideck perimeter netting system.

3.10.4 Inspection & Maintenance

A programme of offshore inspection (in accordance with the manufacturer recommendations / notices), maintenance and replacement (at end of service life) should be established for helideck perimeter safety nets.

3.11 Lighting

Ref: [ICAO Annex 14 Vol 2](#); Chapter 5.3 - [CAA UK - CAP 437](#) Amdt 1 Chapter 4.3 & appendix "D"

Note: *Minimum intensity specifications are given for current operational requirements which specify a minimum meteorology of 1400 m (0.75 Nm). Development of offshore approach aids which permit lower minima (e.g. differential GPS approach) will require a higher intensity (anticipated to a meteorological visibility of 900 m (0.5 Nm)).*

The lighting should be fed from an Uninterrupted Power Supply (UPS) system. The perimeter lights must not be visible by the pilot when flying below the surface of the helideck.

3.11.1 Helideck Perimeter lights

The periphery of the landing area should be delineated by green perimeter lights visible Omni directionally from on or above the landing area. These lights should be above the level of the deck but should not exceed the height limitations (25 cm) and be equally spaced at intervals of not more than 3 metres around the perimeter of the landing area, coincident with the white line delineating the perimeter. There shall be a minimum of 14 lights. The 'main beam' of the green perimeter lights should be of at least 30 candelas intensity.

Iso-candela for helideck perimeter lights

Elevation	Azimuth	Intensity
0° - 90°	-180° to +180°	60 cd max ¹
>20° - 90°	-180° to +180°	3 cd min
>10° - 20°	-180° to +180°	15 cd min
0° - 10°	-180° to +180°	30 cd min

The colour of the light shall be green as defined in [ICAO Annex 14 Vol 1](#) (Appendix 1, para. 2.1.1(c) & para 3.4) / [ICAO Annex 14 Vol 2](#) (para 5.3.8)

Note 1: Where the declared D-value of the helideck is less than the physical helideck area, the perimeter lights should be coincidental with the white perimeter marking and black chevron and delineate the limit of the useable landing area.

Note 2: On existing installations, replacing the existing yellow filter with a green filter will significantly reduce the intensity of the light. Green filters should not be fitted unless a minimum of 10cd is emitted between 0° and 10° elevation for all angles of azimuth. As a consequence of the lower efficiency of green filters compared to yellow, the temperature inside and on external surface of the light will increase. This may have an adverse effect on lamp life and may invalidate the approval of the light for use in hazardous areas.

3.11.2 Helideck Floodlights

The whole of the landing area should be adequately illuminated if intended for night use.

Existing installations:

As an interim measure and where practical therefore, it is recommended replacing the existing deck level floodlighting with a combination of high-mounted floodlights located within the Limited Obstacle Sector (LOS) and deck level floodlights on the opposite edge of the deck to the LOS. If the existing deck level floodlights are suitable for re-use as high-mounted (or LOS) floodlights, the cost of this modification is expected to be modest.

New installations:

The helideck surface texture cues within the touchdown and lift-off area are essential for helicopter positioning during the final approach and landing. Such cues can be provided using various forms of lighting (ASPSL*, LP, floodlights or a combination of these lights, etc.) in addition to perimeter lights. Best results have been demonstrated by the combination of perimeter lights and ASPSL* in the form of encapsulated strips of light emitting diodes (LEDs) to identify the touchdown and heliport identification markings.

* ASPSL : Arrays of Segmented Point Source Lighting

If floodlights are being installed within the OFS (210°) sector, height shall not be more than 25 cm. The floodlighting should be arranged so as not to dazzle and avoiding glare to pilots in flight or to personnel working on the area. If elevated and located off the landing area clear of the LOS, the system should not present an obstacle to helicopters landing and taking off from the

helideck. The arrangement and aiming shall be such that shadows are kept to a minimum. All floodlights should be capable of being switched on and off at the pilot's request and the floodlighting controls should be accessible to, and controlled by, the HLO or Radio Operator.

Note: *Currently, it is not believed that any products are readily available that are suitable for use in the offshore environment. Pending availability of suitable hardware to implement Stage 2 of the helideck lighting improvement programme (lit yellow aiming circle and lit green 'H'), UK CAA recommends replacing existing deck level floodlighting systems with a combination of a minimum of two high mounted halogen floodlights supplemented with two xenon floodlights mounted around the helideck perimeter at deck level opposite the LOS high mounted units.*

3.11.3 Helideck Status light

Ref: [ICAO Annex 14 Vol 1](#) Appendix 1; [CAA UK - CAP 437](#) (Amdt 1 Chapter 4.3.10 CAA Paper 2008/01)

A visual warning system should be installed if a condition can exist on an installation which may be hazardous for the helicopter or its occupants. The system (Status Lights) should be a flashing red light (or lights), visible to the pilot from any direction of approach and on any landing heading. The aeronautical meaning of a flashing red light is either "do not land, helideck not available for landing" or "move clear of landing area". The light system should be integrated with platform safety systems such that it is activated automatically in the event of a process upset system or an appropriate hazard level (e.g. impending gas release) as well as being capable of manual activation by the HLO. It should be visible at a range in excess of the distance at which the helicopter may be endangered or may be commencing a visual approach.



Typical Helideck Status Light

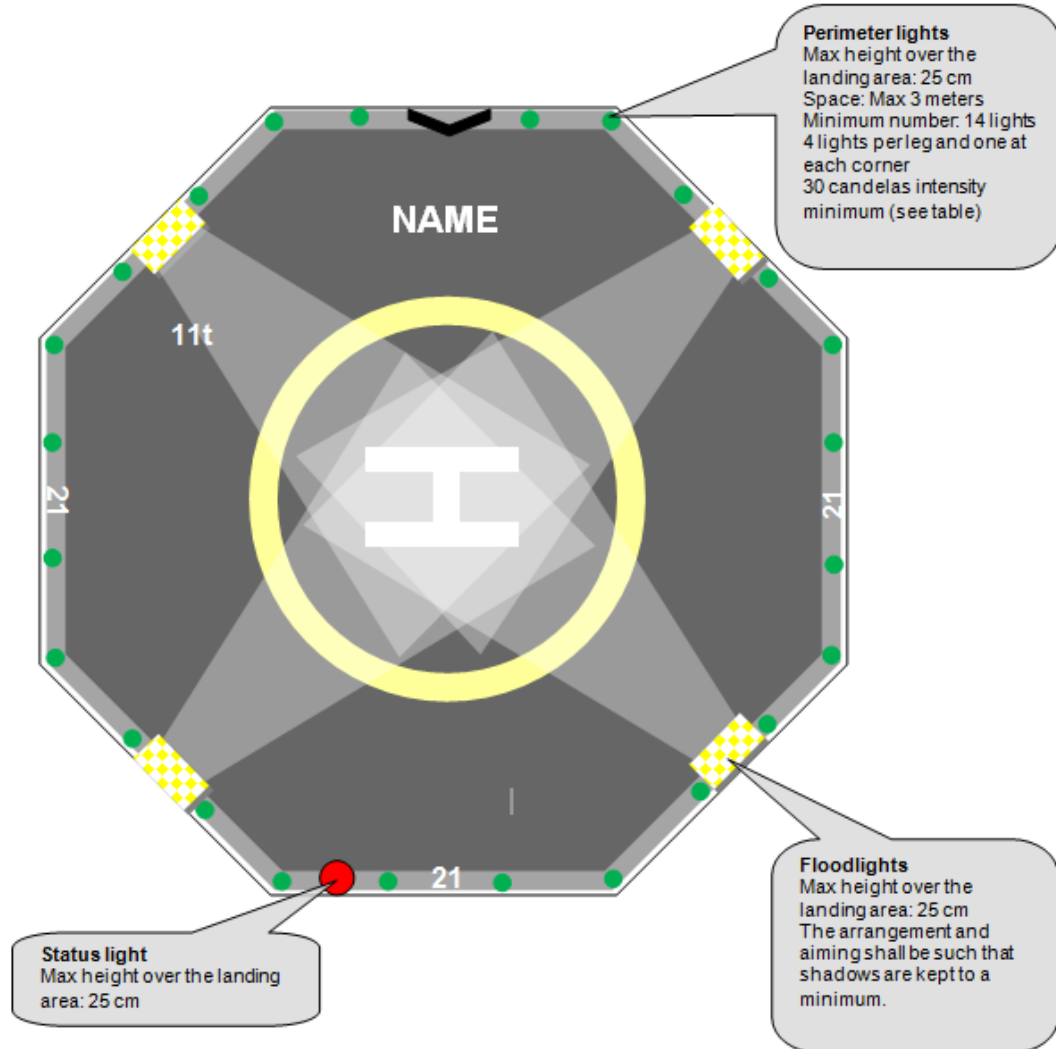


Typical Helideck Status Light (Repeater)

Note: Recent HSE / CAA research into the environments around offshore helidecks has indicated that an appropriate hazard level for helicopters in respect of a hydrocarbon gas release should be set at a maximum limit of 10% LFL (Lower Flammable Limit) anywhere in potential helicopter operating areas.

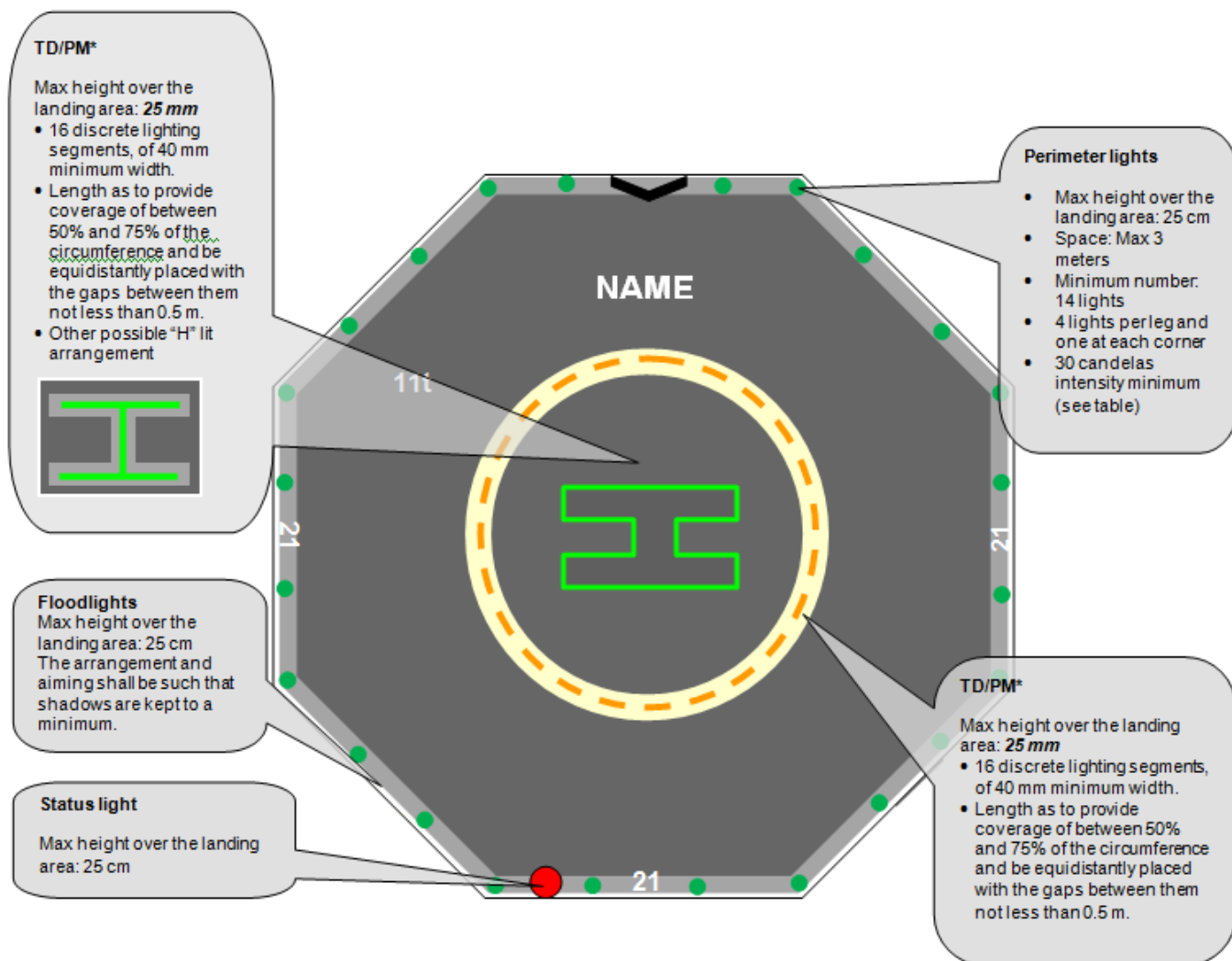
All **NUIs** should be equipped with 'Status Lights' to indicate to flight crews when a condition exists on the installation that may be hazardous to the helicopter and its occupants or the installation. The status lights should be capable of being switched off with a manual override locally from an appropriately manned installation or shore base.

Example of lighting arrangement (with floodlights)



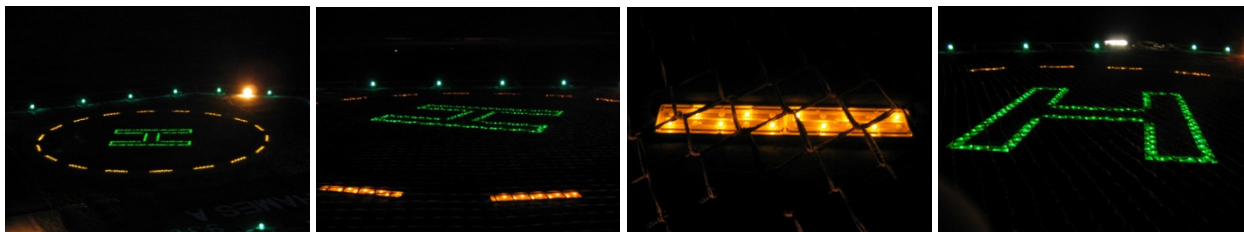
Note: If a floodlights configuration is retained, 4 units should be installed as shown on the drawings

Example of lighting arrangement (with TD/PM* lit lights configuration)
Not yet applicable. ***Should be applicable on 1st January 2012***

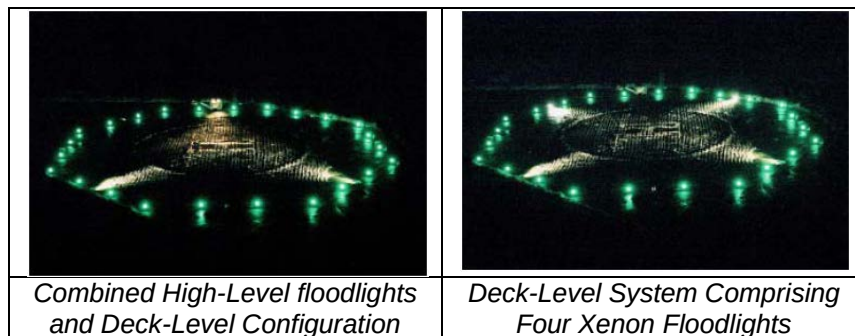




Typical ASPSL lighting system (Helideck Lighting System fitted to North Sea Platform)



Detailed ASPSL lighting system



Others configurations (with floodlights)

- The perimeter lights are to be visible at night from a minimum range of 0.75 NM. 1.6
- The TD/PM circle on the helideck is to be visible at night from a range of 0.5 NM. 1.7
- The Heliport Identification Marking ('H') is to be visible at night from a range of 0.25 NM.

*TD/PM: Touch Down / Positioning Marking

Note: The minimum ranges at which the TD/PM circle and 'H' are visible and usable should still be achieved even where a correctly fitted 200 mm mesh rope netting of 20 mm thickness covers the lighting.

3.11.4 Obstacles – marking lighting

Marking: Fixed obstacles which present a hazard to helicopters should be readily visible from the air. If a paint scheme is necessary to enhance identification by day, alternate black and white, black and yellow, or red and white bands are recommended, not less than 0.5 metres or more than six metres wide.

Lighting: Structures that may require obstruction lighting include:

- Flare / Vent Towers and Booms
- Drilling Derricks
- Radio Masts
- Gas Turbine Exhaust support structures
- Legs on Jack-up Rigs
- Crane Jibs and 'A' Frames.

An Omni directional red light of intensity 25 to 200 cd should be fitted to the highest point of the installation. Where this is not practicable (e.g. on top of flare towers) the light should be fitted as near to the extremity as possible. Any ancillary structure within one kilometre of the landing area, and which is significantly higher than it, should be similarly fitted with red lights. (210° OFS sector up to 1000 m)

Omni directional red lights, of at least 10 cd intensity, should be fitted at suitable locations to provide the helicopter pilot with visual information on the proximity and height of objects which are higher than the landing area and which are close to it or to the LOS boundary.



This should apply, in particular, to all crane booms on the installation. Objects which are more than 15 metres higher than the landing area should be fitted with intermediate red lights of the same intensity spaced at 10 metre intervals down to the level of the landing area (except where such lights would be obscured by other objects).

Flare towers can be a problem for locating and maintaining obstruction lights. The obvious problems associated with high temperatures at the flare tip mean that placing an obstruction light where it is subject to extreme temperatures is not a realistic proposition.

It is often preferable for some structures such as flare booms and towers to be illuminated by floodlights as an alternative to fitting the intermediate red lights, provided that the lights are arranged such that they will illuminate the whole of the structure and not dazzle the helicopter pilot.

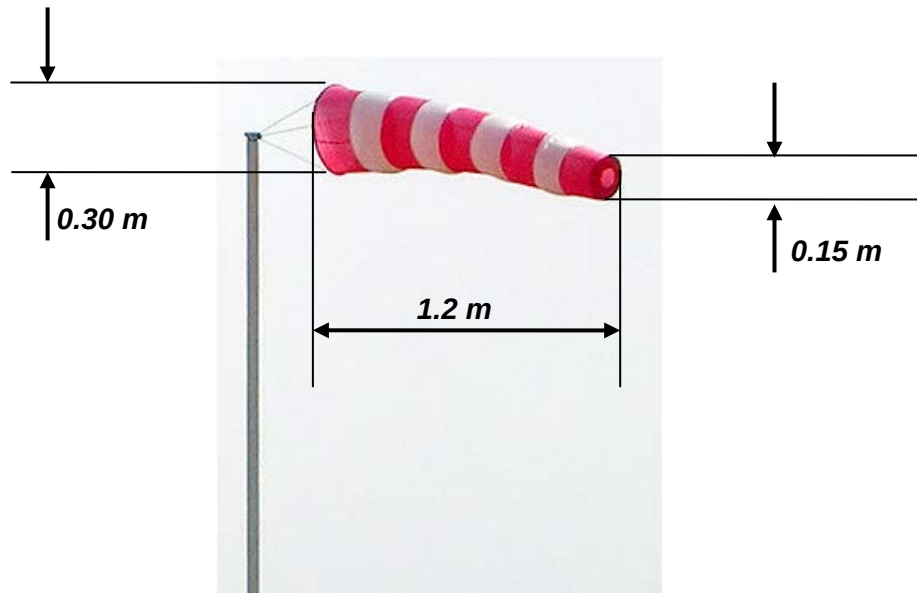


An alternative to fitting obstruction lights on the flare structure is to flood light it from a lower elevation. For instance, on an FPSO, locating the floodlight on top of the 'Turret' may provide both a convenient and effective position to achieve a good result.

3.11.5 Windsock

Ref: [ICAO Annex 14 Vol 2](#) Chapter 5.1.1.5 - [CAA UK - CAP 437](#) Amdt 1 Chapter 4.1.5

A wind direction indicator (windsock) must be provided and located so as to indicate the free stream wind conditions at the installation/vessel location. It is often inappropriate to locate the windsock as close to the helideck as possible where it may compromise obstacle protected surfaces, create its own dominant obstacle or be subjected to the effects of turbulence from structures resulting in an unclear wind indication.



The windsock shall be illuminated for night operations (internal lighting). Some installations may benefit from a second windsock to indicate a specific difference between the local wind over the helideck and the free stream wind.



3.12 Weather monitoring

Ref: CAA UK - CAP 437 Amdt 1 (Chapter 6 & appendix "G"), GS EP GEO 505, OGP Report n° 390 (Chapter 11.5 Weather monitoring systems).

It is strongly recommended that installations are provided with an automated means of ascertaining the following meteorological information at all times:

New built FPSO shall be equipped with such systems

Notes: Where an installation is within 10 miles of another installation that is equipped with an automated means of ascertaining the meteorological information listed above, and which also makes this information routinely available to others, a manual means of verifying and updating the visual elements of observation, i.e. cloud amount and height of base, visibility and present weather, may be used.

Specific requirement in case of Helideck

- Wind direction shall be stated in degrees relative to magnetic North.
- Displayed wind direction shall have the options to show instantaneous 3-second gust wind direction.
- Minute mean wind direction and 10-minute mean wind direction.
- Wind speed shall be stated in knots.
- Displayed wind shall be configurable to show instantaneous 3-second gust wind speed, 2-minute mean wind and 10-minute mean wind speed. A visual alarm should be triggered with gusts exceeding ten knots of the mean wind, and 10-minute mean wind with gusts exceeding 10 knots for 3 seconds or more of the mean 10 minute wind.
- Barometric Pressure in Hpa, meaning, adjusted for height and temperature at sea level (mean over the last 2 minutes).
- Air temperature in degrees Centigrade • Dew point temperature in degrees Centigrade.
- Altitude of lowest cloud base in feet.
- Cloud coverage in stated as few/scattered/broken/overcast (FEW/SCT/BKN/OVC) in feet above the surface.
- Horizontal Visibility in metres.
- Present weather.



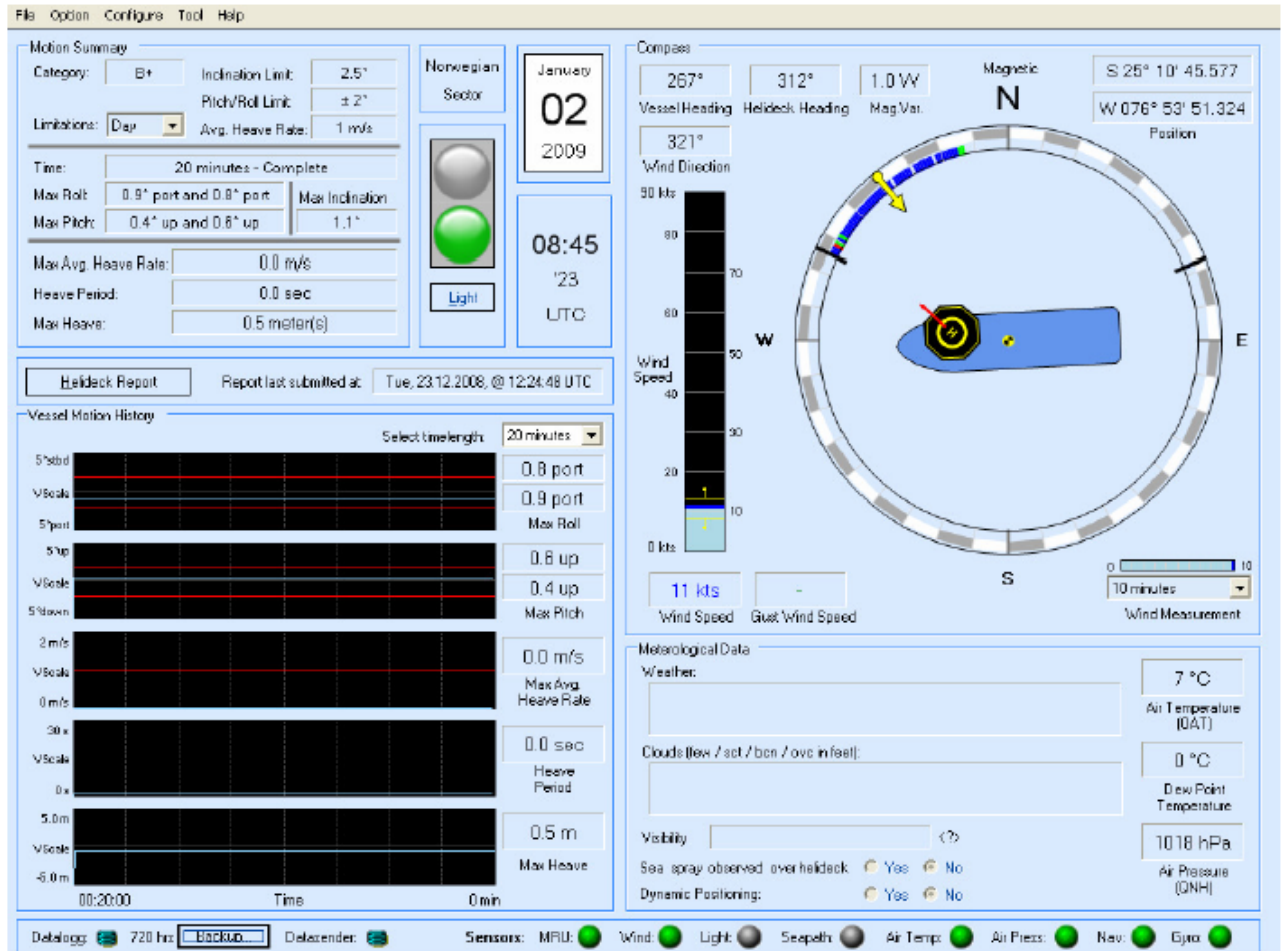
For installations that utilize Emergency Response and Rescue Vessels (ERRV) or Autonomous Rescue and Recovery Craft (ARRC) it is recommended that additionally the following parameters are also ascertained using automated sensors:

- sea state; and
- sea surface temperature.

Should the helideck be placed on a floating platform, then the following motion parameters shall be measured in real-time:

- Max Heave & period (maximum trough to crest excursion; last 20 minutes & alternatively 3 hours for trend determination); in metres at 1' intervals)
- Max average Heave: mean vertical rate for a movement range from
- top to bottom within one cycle over the past 20 minutes.
- Roll left (maximum in degrees from mean position; last 20 minutes)
- Roll right (maximum in degrees from mean position; last 20 minutes)
- Pitch up (maximum in degrees from mean position; last 20 minutes & alternatively 3 hours for trend determination)
- Pitch down (maximum in degrees from mean position; last 20 minutes & alternatively 3 hours for trend determination)
- Heading in degrees relative to magnetic North. (1 second values updating at 1 second intervals)
- Others: motion severity index (MSI) & Wind severity index (WSI)
- A logging system that should be able to log all data for 90 days. The historic data should be available by configuring the date and time to the period of interest.
- All provided information should be easily accessible to crews through web networking from onshore base.

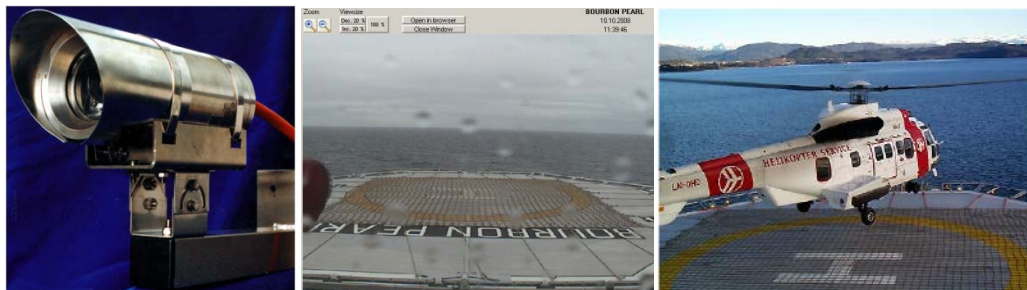
3.12.1 Typical displays



3.13 Helideck video monitoring

A Helideck video monitoring system should be available, with a digital recording capability, consisting in two video cameras for redundancy purpose and cross monitoring.

Display monitors should be located in the radio room and in the passengers administration office.



3.14 Fire fighting services

Ref: [ICAO Annex 14 Vol 2](#) Chapter 6.1 - [CAA UK - CAP 437](#) Amdt 1 Chapter 5.

3.14.1 Response time

The rescue and fire fighting service on helideck should be immediately available on or in the vicinity of the heliport while helicopter movements are taking place.

Note: A fire is deemed to be 'under control' at the point when it becomes possible for the occupants of the helicopter to be effectively rescued by trained fire-fighters.

3.14.2 Level of protection

Delivery system can be either Fixed Monitor System (FMS) or deck Integrated Fire Fighting System (DIFFS). DIFFS system, as an alternative to FMS, is strongly encouraged on new built helidecks.

The necessary level of fire fighting protection is determined according to the helicopter category.

Helideck fire fighting category (see [Aircraft table](#))

Category	Helicopter overall length
H1	up to but not including 15 m
H2	from 15 m up to but not including 24 m
H3	from 24 m up to but not including 35 m

- The main agent must be a foam meeting performance level 'B'.

The amount of water used for foam production and the amounts of complementary agents must correspond to the category of helideck.

Minimum usable amounts of extinguishing agents for helidecks

Category	Foam production		Complementary agents		
	Water (litres)	Discharge rate (l/min)	Dry chemical powder (kg)	or Halon (kg)	or CO2 (kg)
H1	2500	250	45	45	90
H2	5000	500	45	45	90
H3	8000	800	45	45	90

Special case: DIFFS system should be considered. Where it is not fitted, minimum means shall be: 1 dry powder of not less than 45Kg and a CO2 with engine applicator of not less than

22.5Kg. Serious consideration should be given to a portable foam unit with a minimum capacity of 90 litres.

3.14.3 Rescue Equipment

In the event of a helicopter crash on the helideck, appropriate tools and equipment must be readily available to free the passengers. This equipment must be stored in a quickly accessible place on the helideck.

Crash box inventory (Ref: [CAA UK - CAP 437](#) Amdt 1 Chapter 5.7.2).



Helicopter RFF Category (See Aircraft table)		
	H1/H2	H3
Adjustable wrench	1	1
Rescue axe, large (non wedge or aircraft type)	1	1
		

Cutters, bolt 	1	1
Crow bar (large)	1	1
Hook, grab or salving	1	1
Hacksaw heavy duty and six spare blades 	1	1
Blanket, fire resistant 	1	1
Ladder (two-piece) *	1	1

Life line (5 cm circumference x 15 m in length) plus rescue harness 	1	1
Pliers, side cutting (tin snips)	1	1
Set of assorted screwdrivers	1	1
Harness knife and sheath ** 	**	**
Gloves, fire resistant **	**	**
Self-contained breathing apparatus (complete) 	2	2
Power cutting tool	-	1

Additional		
Torches lights	2	2
		

* For access to casualties in an aircraft on its side

** This equipment is required for each helideck crew member

3.15 Backup Electrical Supply

It is useful to have a 28 V electrical source in case of helicopter battery failure. A standardised cable can be used to connect the helicopter to this external source. Models of 220 V/28 V transformers exist with a built-in battery. This facility avoids the need for a 28 V power supply near the helideck.



Trolley model equipped with lead batteries



Trolley model equipped with lead batteries

3.16 Fuelling

Ref: **CAA UK - CAP 437** Amdt 1 (Chapter 7 – Helicopter Fuelling Facilities).

3.16.1 General

The OPITO Helicopter Refuelling Handbook may be considered as the reference document on this subject. Further information can be obtained in section 5 (Aviation Fuel Introduction) of the Helideck Manual issued by the OLF (<http://www.olf.no>) and in document CAP 437 from the UK CAA. This chapter deals essentially with the aeroplane fuel Jet A1.

Consideration to provide Jet-A1 refuelling facilities should be given where the distance from shore to an installation or vessel (with an operational helideck) exceeds 50 nautical miles.

3.16.2 Refuelling Station

An offshore fuelling system generally includes:

- A transit tanks;
- A static storage facilities and, if installed, a sample reclaim tank
- A pumping system
- A delivery system.

In addition, a flashing light will be installed visible from the pilot when refuelling is in progress.

Remarks:

- The tanks must be located inside a fuel trap able to contain at least the quantity of one tank in case of accidental drainage of one of the tanks.
- Tanks on offshore installations are generally transportable for filling on land. In certain cases, they can be mounted on supports and jettisoned into the sea in an emergency.
- The fuel pumps are electric pumps or air pumps.
- Refer to the next page for a diagram of a typical refuelling facility.



3.16.3 Fuel Contamination

Fuel can be contaminated by the presence of water, particles and dust as well as by bacteriological development.

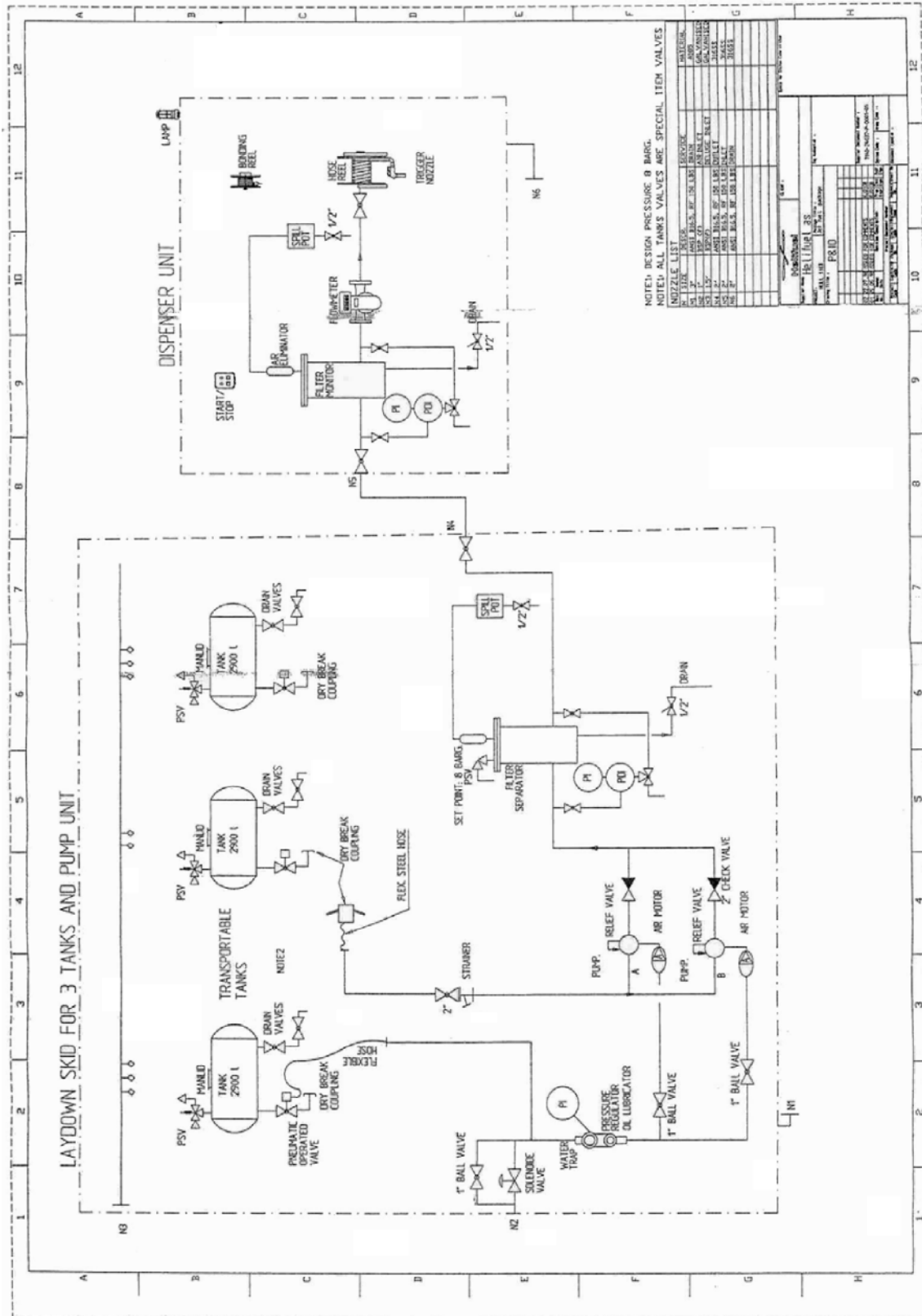
To maintain satisfactory quality, a filtering system is set up (see diagram):

- Filter/water separator: eliminates particles down to 1 micron and water droplets to 15 ppm (cf. OPITO),
- Filter/monitor: eliminates particles down to 1 micron and the remaining water.

These two types of filter are backed up by a differential pressure system designed to monitor all risks of blockage: the maximum limit for differential pressure is 15 psi for the filter/water separator and 22 psi for the filter/monitor.

A filter can also be placed on the nozzle.

The product "BIOBOR" can be used as a preventive treatment of bacteriological development.





3.16.4 FACILITY MAINTENANCE

Ref: **CAA UK - CAP 437** (Amdt 1 Chapter 8 – Helicopter Fuelling Facilities – Maintenance and fuelling procedures).

The facility must be serviced regularly to deliver quality fuel.

- A periodical maintenance schedule must be drawn up and tracked (on computer, if possible) and completed work recorded. In particular, check the circuit for leaks.
- The tanks must be inspected and cleaned regularly: normally inspection every year or, preferably, before each replenishment, and cleaning every two years (to be adapted according to manufacturer's recommendations according to the type of tank used). All of these inspections must be recorded in a log and the following inscriptions painted on one of the flat sides of the tanks (side visible to the Fuelling Officer when the tank is installed):
 - ◊ Jet A1,
 - ◊ storage capacity (in litres),
 - ◊ date of latest visual inspection,
 - ◊ date of latest cleaning operation.
- The filters must be changed or inspected every six or twelve months (depending on the type of filter) and the differential pressure recorded every week. Indicate the date of the latest filter change on the filter body or bodies.

3.16.5 Fuel Quality

Fuel quality is ensured at the following stages:

- on leaving the refinery by the issue of a "refinery quality certificate";
- on the facility by the filters, and through visual inspections and the use of the Shell Water Detector. In addition to these inspections, an "acceptability check" may be carried out by measuring fuel density with a hydrometer. This check is sometimes performed to confirm that product quality has not changed in transit or storage, by comparing the value obtained with the value indicated on the refinery certificate. If the figures adjusted to the reference temperature of 15°C differ by more than 3 kg/m³, contamination may have occurred;
- on the facility by means of a contamination check using the BORON kit (periodicity to be defined according to local conditions - every six months, for example).

N.B.

- Before inspecting and using the fuel in a facility, allow time to settle: at least six hours for offshore tanks (under 3000 l).
- When taking fuel samples, use preferably a clean glass receptacle with a capacity of 2 to 4 l.



4. Normally unattended Installations (NUI)

Normally unattended installation shall comply with above considerations. In addition it shall be subject to a risk assessment due to the low frequency of use.

Special attention shall be given to the following points:

- Passengers operations
 - An HLO or HDA shall be on board the aircraft to assist in disembarking and boarding the passengers.
- Physical characteristics
 - Due to Guano issues that may seriously affect the visual aids (markings & lightings) and surface friction, the removal of landing net shall not be considered, except:
 - . If procedures are in place which guarantee that the helideck will remain clear of contaminants such that there is no risk of helideck markings and visual cues being compromised or friction properties reduced.
 - . For the case of operations with skids equipped helicopter.
 - . In that case, the coefficient friction shall comply with # 3.7.3.2
 - NUIs shall be monitored continuously for signs of degradation of visual cues and flights shall not be undertaken to helidecks where essential visual cues for landing are insufficient
- Helideck rescue and fire fighting
 - Serious consideration shall be given to the selection and provision of foam as the principle agent
 - DIFFS should be considered
- Lighting
 - Status light shall have a resetting system that do not require a helicopter to land on the helideck (remote system)

Appendix 1 Definition and acronyms

ANO	The Air Navigation Order 2005 (as amended).
AOC	Air Operator's Certificate.
API	American Petroleum Institute.
ASPSL	Arrays of Segmented Point Source Lighting.
CFD	Computational Fluid Dynamics
Class Societies	Organisations that establish and apply technical standards to the design and construction of marine facilities including ships.
D-circle	A circle, usually hypothetical unless the helideck itself is circular, the diameter of which is the D-value of the largest helicopter the helideck is intended to serve.
D-value	The largest overall dimension of the helicopter when rotors are turning. This dimension will normally be measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane (or the most rearward extension of the fuselage in the case of Fenestron or Notar tails).
DIFFS	Deck Integrated Fire Fighting System(s).
Falling 5:1 Gradient	A surface extending downwards on a gradient of 5:1 measured from the edge of the safety netting located around the landing area below the elevation of the helideck to water level for an arc of not less than 180° that passes through the centre of the landing area and outwards to a distance that will allow for safe clearance from obstacles below the helideck in the event of an engine failure for the type of helicopter the helideck is intended to serve. For helicopters operated in Performance Class 1 or 2 the horizontal extent of this distance will be compatible with the one-engine inoperative capability of the helicopter type to be used.
FMS	Fixed Monitor System.
FOD	Foreign Object Debris/Damage.
HCA	Helideck Certification Agency (formerly known as BHAB Helidecks). The HCA is the certifying agency acting on behalf of the UK offshore helicopter operators that audits and inspects all helidecks on offshore installations and vessels operating in UK waters to the standards laid down in CAP 437. In the text of this document the term 'Helideck Certification Agency' is used in relation to the UK system for clearing helidecks for helicopter operations. Outside the UK, where this system is not in place, the term should be replaced by 'Helicopter Operator(s)'.
HDWG	Heliport Design Working Group.
Helideck	A landing area on an offshore installation or vessel.

HLAC	The Helideck Landing Area Certificate issued by the HCA, and required by UK offshore helicopters operators, to authorise the use of a helideck.
HLL	Helideck Limitations List (formerly known as the Installation/Vessel Limitation List (IVLL)). Published and distributed by the HCA in UKCS or other National Authority accepted bodies in other North Sea States.
HLO	Helicopter Landing Officer.
HSE	Health and Safety Executive.
IATA	International Air Transport Association.
ICAO	International Civil Aviation Organization.
ICP	Independent and competent person as defined in the Offshore Installations (Safety Case) Regulations 2005 who is selected to perform functions under the verification scheme.
ICS	International Chamber of Shipping.
IMO	International Maritime Organization.
ISO	International Standards Organization.
Landing Area	A generic term referring to the load-bearing area primarily intended for the landing or take-off of aircraft. The area, sometimes referred to as the Final Approach and Take-Off area (FATO), is bounded by the perimeter line and perimeter lighting.
LED	Light Emitting Diode.
LFL	Lower Flammable Limit.
LOS	Limited Obstacle Sector. The 150° sector within which obstacles may be permitted, provided the height of the obstacles is limited.
MEK	Methyl Ethyl Ketone.
MTOM	Maximum Take-Off Mass.
NAI	Normally Attended Installation.
NM	Nautical Miles.
NUI	Normally Unattended Installation.
OFS	Obstacle Free Sector. The 210° sector, extending outwards to a distance that will allow for an unobstructed departure path appropriate to the helicopter the helideck is intended to serve, within which no obstacles above helideck level are permitted. For helicopters operated in Performance Class 1 or 2 the horizontal extent of this distance will be compatible with the one-engine inoperative capability of the helicopter type to be used.
OGUK	Oil and Gas UK (formerly known as the United Kingdom Offshore Operators Association (UKOOA)).
OIAC	Offshore Industry Advisory Committee.



Appendix 1

OIAC-HLG	Offshore Industry Advisory Committee – Helicopter Liaison Group.
Perimeter D Marking	The marking located in the perimeter line in whole numbers; i.e. the D-value (see above) rounded up or down to the nearest whole number.
PPE	Personal Protective Equipment.
RD	Rotor Diameter.
RFF	Rescue and Fire Fighting.
Run-Off Area	An extension to the Landing Area designed to accommodate a parked helicopter; sometimes referred to as the Parking Area.
SCBA	Self-Contained Breathing Apparatus.
TD/PM Circle	Touchdown/Positioning Marking Circle. Described as the Aiming Circle in earlier editions of CAP 437, the TD/PM Circle is the aiming point for a normal landing so located that when the pilot's seat is over the marking, the whole of the undercarriage will be within the landing area and all parts of the helicopter will be clear of any obstacles by a safe margin. Note: It should be noted that only correct positioning over the TD/PM Circle will ensure proper clearance with respect to physical obstacles and provision of ground effect and provision of adequate passenger access/egress.
UKCS	UK Continental Shelf (Geographical area).
UPS	Uninterrupted Power Supply.
Verification Scheme	A suitable written scheme as defined in the Offshore Installations (Safety Case) Regulations 2005 for ensuring the suitability and proper maintenance of safety-critical elements.