



GUIDE FOR THE CLASS NOTATION

HELICOPTER DECKS AND FACILITIES (HELIDK AND HELIDK(SRF))

APRIL 2008

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Incorporated by Act of Legislature of
the State of New York 1862**

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Foreword

ABS currently has requirements for design of helicopter decks and helicopter facilities in several Rules and Guides, including the *Rules for Building and Classing Steel Vessels*, the *Rules for Building and Classing Steel Vessels Under 90 meters (295 feet) in Length*, the *Rules for Building and Classing Mobile Offshore Drilling Units*, the *Rules for Building and Classing Steel Barges*, and the *Guide for Building and Classing Liftboats*.

This Guide consolidates the above requirements for easy application of the Rule requirements for the optional notations **HELIDK** and **HELIDK(SRF)**. For convenience, an easy-to-follow road map for classification of helicopter decks and helicopter facilities is also provided (see Appendix 1).



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SECTION 1 Introduction

1 Scope

This Guide covers design, systems and survey criteria for helicopter decks and facilities on vessels and mobile offshore drilling units classed with ABS.

This consolidated Guide is applicable for helicopter decks and facilities for the following Rules and Guides:

- *Rules for Building and Classing Steel Vessels (Steel Vessel Rules)* (3-2-11/11, 4-6-7/9, 4-7-2/5.3, et al.)
- *Rules for Survey After Construction* (7-3-2/1.1.11, 7-6-2/1.1.10, et al.)
- *Rules for Building and Classing Steel Vessels Under 90 meters (295 feet in Length) (Under 90m Rules)* (3-2-9/11, 4-4-8/3, 4-5-1/7, et al.)
- *Rules for Building and Classing Mobile Offshore Drilling Units (MODU Rules)* (3-2-2/3, 4-2-6/7, 5-2-3/9, 6-2-4/1, 6-2-4/7, et al.)
- *Rules for Building and Classing Steel Barges (Barge Rules)* (Section 3-2-11, et al.)
- *Guide for Building and Classing Liftboats (Liftboat Guide)* (3-2-11/5, 4-5-7/1, 4-6-1/7, et al.)
- *Rules for Building and Classing Offshore Installations*
- *Guide for Building and Classing Facilities on Offshore Installations*
- *Guide for Building and Classing Offshore LNG Terminals*

See also the flowcharts in Appendix 1 for a detailed map of the above requirements.

3 Application

This Guide is applicable to helicopter decks and helicopter facilities on steel vessels of all lengths, steel barges, mobile offshore drilling units, and liftboats.

Vessels in compliance with this Guide will be assigned the following notations:

- Vessels with a helicopter deck intended for landing with no provision for storage or refueling and complying with Sections 2 and 6 of this Guide will be assigned the notation **HELIDK**.
- Vessels with a helicopter deck and a helicopter facility for storage and/or refueling and complying with Sections 2 through 6 of this Guide will be assigned the notation **HELIDK(SRF)**.

5 Definitions

Helicopter Deck (Helideck) – a purpose-built helicopter landing area, on a vessel or unit including all structure, fire fighting appliances and other equipment necessary for the safe operation of helicopters, but not those areas for occasional or emergency helicopter operations (e.g., circle H marked on hatch covers for drop-off/pickup of pilot).

Helicopter Facility – a helideck including any refueling and hangar facility.

7 Submission of Design Plans and Data

7.1 Structural Plans

Plans showing the arrangement, scantlings and details of the helicopter deck are to be submitted for review and approved before the work of construction is commenced.

- These plans are to clearly indicate the scantlings, structural details and welding, or other methods of connection.
- The arrangement plan is to show, in both plan view and elevation, the overall size of the helicopter deck and the designated landing area. If the arrangement provides for the securing of a helicopter or helicopters to the deck, the predetermined position(s) selected to accommodate the secured helicopter, in addition to the locations of deck fittings for securing the helicopter, are to be shown.
- The type of helicopter to be considered is to be specified and calculations for appropriate loading conditions are to be submitted.

In general, plans are to be submitted in triplicate. Additional plans may be required where the required attendance of the Surveyor is anticipated at more than one location.

7.3 Machinery and Systems Plans

In addition to the above, for helicopter facilities for storage and refueling of helicopters, the following plans are to be submitted:

- Helicopter refueling system, fuel storage tank and its securing and bonding arrangements
- Helicopter operations fire fighting system (where applicable)

7.5 Operation Manual

Each helicopter facility is to have an operation manual, specifying a description and a checklist of safety precautions, procedures and equipment requirements. This manual may be part of the Operation Manual for the vessel, mobile offshore drilling unit or liftboat, as applicable.



SECTION 2 Structural Design and Safety Criteria

1 General

Helicopter decks are to meet the following structural and safety requirements. The attention of Owners, builders and designers is directed to various international and governmental regulations and guides regarding the operational and other design requirements for helicopters landing on vessels or units.

3 Helicopter Deck Loading

Scantlings of helicopter decks and supporting structure are to be determined on the basis of the following loading conditions, whichever is greater, in association with the allowable factors of safety shown in Section 2, Table 1. Plastic design considerations may be applied for deck plating and stiffeners.

Scantlings of helicopter decks and supporting structures are to be such that the resulting stress in members does not exceed:

$$Y/F_s$$

where

Y = specified minimum yield point or yield strength of the material

F_s = factor of safety, as given in Section 2, Table 1

3.1 Overall Distributed Loading

For platform type helicopter decks, minimum distributed loading of 2010 N/m² (205 kgf/m², 42 lbf/ft²) is to be taken over the entire helicopter deck.

For all other helicopter decks provided on part of the vessel's structure deck (e.g., deckhouse/superstructure top or strength/weather deck), the minimum weather load as specified for each type of vessel is also to be applied (see also 2/3.11).

3.3 Helicopter Landing Impact Loading

A load of not less than 75% of the helicopter maximum take-off weight is to be taken on each of two square areas, 0.3 m × 0.3 m (1 ft × 1 ft). Alternatively, the manufacturer's recommended wheel impact loading will be considered. The deck is to be considered for helicopter landings at any location within the designated landing area. The structural weight of the helicopter deck is to be added to the helicopter impact loading when considering girders, stanchions, truss supports, etc. Where the upper deck of a superstructure or deckhouse is used as a helicopter deck and the spaces below are normally manned (quarters, bridge, control room, etc.), the impact loading is to be multiplied by a factor of 1.15.

TABLE 1
Allowable Factors of Safety Based on Y for Helicopter Decks

Y = specified minimum yield point or yield strength of the material as defined in 2-1-1/13 of the *ABS Rules for Materials and Welding (Part 2)*

	<i>Plating</i>	<i>Beams</i>	<i>Girders, Stanchions, Truss Supports, etc. (See Note 3)</i>
Overall Distributed Loading	1.67 <i>(See Note 1)</i>	1.67	1.67
Helicopter Landing Impact Loading	<i>(See Note 2)</i>	1.00	1.10
Stowed Helicopter Loading	1.00	1.10	1.25

Notes:

- 1 The minimum plate thickness t is generally not to be less than obtained from the following:

<i>Beam Spacing</i>	<i>t</i>	<i>Beam Spacing</i>	<i>t</i>
460 mm	4.0 mm	18 in.	0.16 in.
610 mm	5.0 mm	24 in.	0.20 in.
760 mm	6.0 mm	30 in.	0.24 in.

- 2 An allowable stress that exceeds Y may be considered provided the rationale of the submitted analysis is sufficiently conservative.
- 3 For members subjected to axial compression, the factor of safety is to be based on the yield stress or critical buckling stress, whichever is less.
- 4 The minimum plate thickness for materials other than steel will be specially considered.

3.5 Stowed Helicopter Loading

If provisions are made to accommodate helicopters secured to the deck in a predetermined position, the structure is to be considered for a local loading equal to the manufacturer's recommended wheel loading at maximum take-off weight, multiplied by a dynamic amplification factor based on the predicted motions of the vessel or unit for this condition, as may be applicable for the vessel or unit under consideration.

In addition to the helicopter load, a uniformly distributed loading of 490 N/m² (50 kgf/m², 10.5 lbf/ft²), representing wet snow or ice, is to be considered, if applicable. For the girders, stanchions, truss supports, etc., the structural weight of the helicopter deck is also to be considered.

3.7 Loading due to Motions of Vessel or Unit

The structure supporting helicopter decks is to withstand the loads resulting from the motions of the vessel or unit.

3.9 Special Landing Gear

Helicopters fitted with landing gear other than wheels will be specially considered.

3.11 Environmental Loading

Calculations are to consider anticipated wind and wave impact loading on helicopter decks and their supporting structures.

5 Helicopter Deck Arrangements

5.1 Size

5.1.1

In general, the helicopter deck is to be of sufficient size to contain a circle of a diameter equal to at least the rotor diameter of the largest helicopter using the helicopter deck. The helicopter deck is to have an approach/departure sector of at least 180° free of obstructions. The base of this sector is to be tangent to the periphery of the circle described above, as shown in Section 2, Figure 1. Outside the approach/departure sector, obstructions within one-third of the rotor diameter from the periphery of the circle described above are not to extend above a plane measured vertically from the edge of the deck with a rise equal to half of the horizontal distance from the periphery of the above circle.

5.1.2

Where adverse climatic conditions are prevalent for normal helicopter operation, a helicopter deck is to have sufficient size to contain a circle of a diameter at least equal to the overall length of the largest helicopter using the helicopter deck. The approach/departure sector is to be not less than 210° free of obstruction and is to intersect the periphery of the circle described above, as shown in Section 2, Figure 1. Outside the approach/departure sector, obstructions within one-third of the helicopter's overall length from the periphery of the circle described above are not to extend more than $\frac{1}{20}$ of the helicopter overall length above the level of the helicopter deck. The overall length of a helicopter is the distance from the tip of the main rotor blade to the tip of the tail rotor when the rotor blades are aligned along the longitudinal axis of the helicopter.

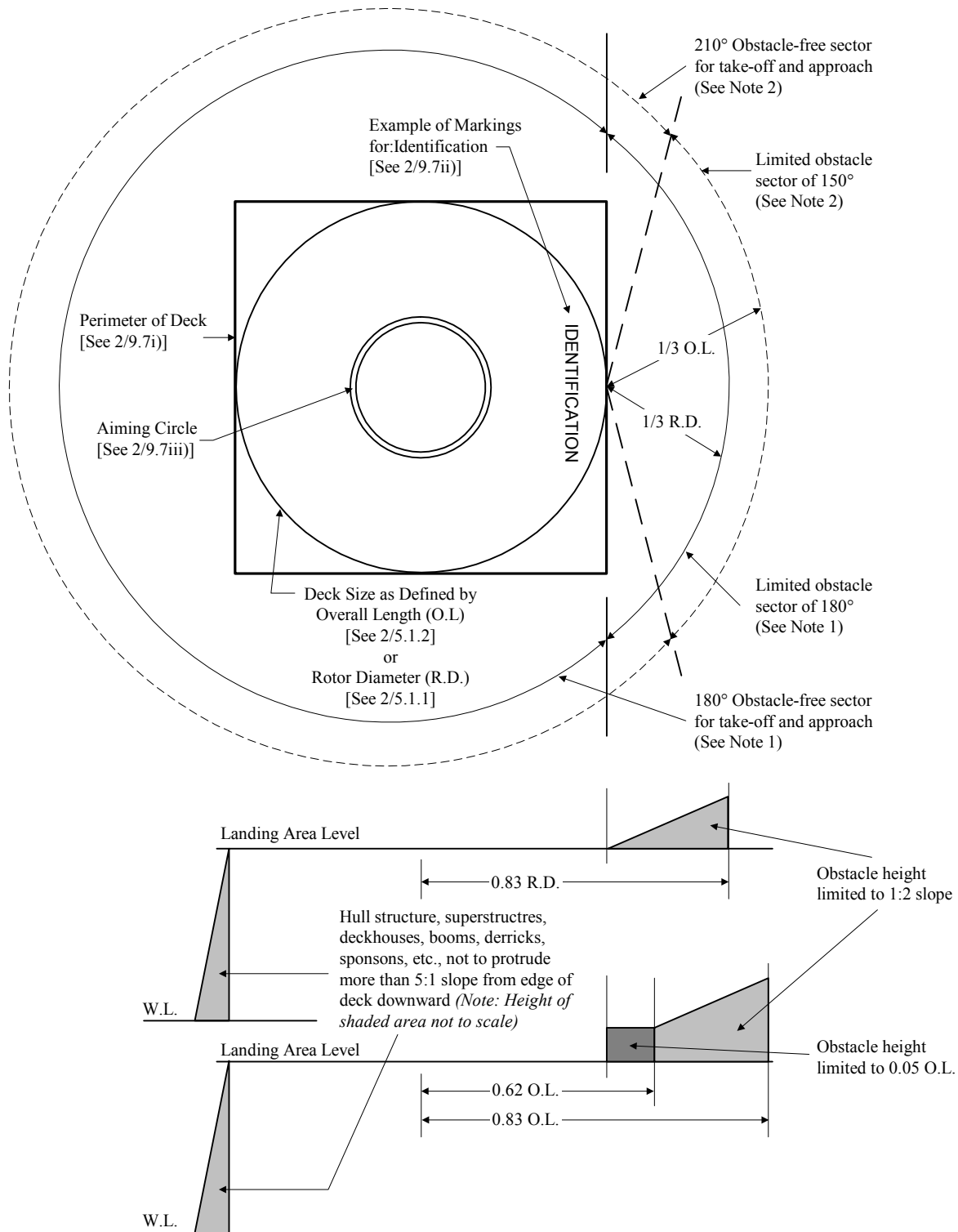
5.3 Surface

The helicopter deck is to have a non-skid surface.

5.5 Grating Type Construction

Where the helicopter deck is constructed in the form of grating, the under deck should be such that the ground effect is maintained.

FIGURE 1
Example of Helicopter Deck Arrangement



Notes:

- 1 Approach/departure sector and limited obstruction area defined in 2/5.1.1 shown by solid line —————.
- 2 Approach/departure sector and limited obstruction area defined in 2/5.1.2 shown by broken line - - - - -.
- 3 Although a square helicopter deck is shown, other configurations are commonly used.

7 Arrangements

7.1 Projections

The helicopter deck is to be free of projections except that landing lights or other essential projections may be installed around the periphery of the deck provided they do not rise more than 150 mm (6 in.) above the level of the helicopter deck.

7.3 Tie Downs

The helicopter deck is to have recessed tie-down points for securing a helicopter.

9 Safety

9.1 Safety Net

For personnel protection, a safety net as least 1.5 m (5 ft) wide is to be provided around the periphery of the helicopter deck, except where structural protection exists. The net should be inclined upwards and outwards from below the edge of the helicopter deck to a horizontal distance of 1.5 m. The outer edge of the safety net or structural protection is not to rise more than 150 mm (6 in.) above the edge of the deck.

9.3 Means of Escape and Access

The helicopter deck is to be provided with both a main and an emergency means of escape and access for fire fighting and rescue personnel. These means are to be located as far apart from each other as is practicable and preferably on opposite sides of the helicopter deck.

9.5 Visual Aids

9.5.1 General

Coastal States may have specific requirements and must be incorporated into the design. Where the Coastal State has no requirements, the following are to be complied with:

9.5.2 Wind Indicator

A wind direction indicator located in an unobstructed area readily visible to helicopters approaching the helicopter deck is to be provided. Vessels or units on which night helicopter operations take place should have provisions to illuminate the wind direction indicators.

9.7 Markings

Unless specific requirements are provided by the flag Administration or the cognizant authority (in which territorial waters the vessel or unit is being operated), the helicopter deck is to be marked in a contrasting color as follows (see also Section 2, Figure 1):

- i)* The perimeter with a continuous line of 400 mm (15.75 in.) in width
- ii)* Vessel or unit identification
- iii)* Aiming circles in yellow, taking into account deck configuration, helicopter type and operational requirements (e.g., MODU Code: an inside diameter equal to $0.5 \times$ overall length. The width of the line should be 1 m.)
- iv)* A white “H” centered on the landing area with the horizontal on the bisector of the obstacle-free sector. The “H” should be 3 m high, 1.8 m wide and 0.4 m wide lines.

9.9 Lights

9.9.1 Perimeter Lights

Each helicopter deck is to be fitted with omni-directional yellow and blue lights, in alternate order, to enable the landing area to be easily identified at night. These lights should be positioned around the perimeter of the deck not more than 3 m (9'-10") apart.

9.9.2 Floodlights

Helicopter deck floodlights, where fitted, should be located so as to avoid glare to pilots. The arrangement and aiming of floodlights should be such that helicopter deck markings are illuminated and that shadows are kept to a minimum.

11 Materials

In general, the construction of helicopter decks is to be of steel or other material with equivalent ability to retain structural capacity in a fire (at least A-0 class). If the helicopter deck forms the deckhead of a deckhouse or superstructure, it is to be insulated to A-60 class standard.

Aluminum alloys may be used for helicopter decks above deckhouses, provided the following conditions are complied with:

- i)* There are to be no openings in the exterior bulkheads directly below the helicopter deck
- ii)* All windows in the lower exterior bulkheads are to be fitted with steel shutters.



SECTION 3 Helicopter Refueling Systems

1 Steel Vessels (Greater than 90 meters in Length)

The following requirements for helicopter refueling systems apply to steel vessels greater than 90 meters in length.

1.1 Application

The requirements of Subsection 3/1 are applicable to helicopter refueling facilities for fuel with a flash point at or below 60°C (140°F) close cup test. For fuel with a flash point of above 60°C, the requirements for spill containment in 3/1.5 hereunder and the requirements for fuel oil storage and transfer systems in 4-6-4/13 of the *Steel Vessel Rules* are applicable, as appropriate.

1.3 Fuel Storage and Refueling Equipment Area

1.3.1 Isolation

The designated fuel storage and refueling areas are to be isolated from the following:

- Accommodation areas including vent openings;
- Embarkation stations;
- Escape routes;
- Helicopter landing area; and
- Areas containing any source of vapor ignition.

The method of isolation may be by means of a safe and adequate distance or suitably erected barriers capable of preventing the spread of fire.

1.3.2 Hazardous Area

The fuel storage and refueling area is to be permanently marked to identify it as a restricted area where smoking or other naked flame is not permitted. “NO SMOKING” signs are to be displayed. Open spaces within 3 m (10 ft) of the refueling equipment and within 3 m of the storage tank vent outlet are to be regarded as hazardous areas (see 5/1.1).

1.5 Spill Containment

The fuel storage area is to be provided with arrangements whereby fuel spillage can be collected and drained to a safe location. These arrangements are to be at least as provided hereunder.

1.5.1 Coaming

A coaming surrounding the fuel storage tanks, associated piping and the pumping unit is to be provided. The height of this coaming is to be at least 150 mm (6 in.), so as to contain fuel spillage as well as fire extinguishing agents. Where the pumping unit is situated at a remote distance from the fuel storage tank, a separate coaming of the same minimum height is to be provided around the pumping unit.

1.5.2 Drainage

Arrangements for drainage from within the coaming area are to be as follows.

- i) Permanent piping and a suitable holding tank are to be fitted so that drainage can be either led to the holding tank (for draining oil) or discharged overboard (for draining water) through a three-way valve. No other valve is permitted in the drain piping.
- ii) The cross sectional area of the drain pipe is to be twice that of the storage tank outlet pipe.
- iii) The area within the coaming is to be sloped towards the drain pipe.

Where the area within the coaming is not provided with drainage arrangements, the height of the coming is to be sufficient to contain the full volume of the fuel storage tank plus 150 mm (6 in.).

Drainage piping of helicopter decks is to be constructed of steel. The piping is to be independent of any other piping system and is to be led directly overboard close to the waterline. The drain is not to discharge onto any part of the vessel.

1.7 Fuel Storage Tanks

1.7.1 Construction

Fuel storage tanks are to be of metallic construction. Mounting, securing arrangements and electrical bonding arrangements are to be submitted for approval.

1.7.2 Tank Valves

Fuel storage tank outlet valves are to be provided with a means of remote closure. Such means is not to be cut off in the event of a fire in the fuel storage and the refueling area. In general, the provisions of 4-6-4/13.5.3 of the *Steel Vessel Rules* are to be complied with.

1.7.3 Tank Vents and Sounding

In general, the provisions of 4-6-4/9 and 4-6-4/11 of the *Steel Vessel Rules* are applicable. However, tank vents are to be extended at least 2.4 m (8 ft) above the weather deck. Other venting arrangements will be considered.

1.9 Refueling Pumps

The refueling pump is to incorporate a device that will prevent overpressurization of the delivery hose or of the filling hose. A relief valve, where fitted, is to discharge either to the suction side of the pumps or to the storage tanks. Means are to be provided for remote stopping of the refueling pumps from a position not likely to be cut off in the event of a fire in the fuel storage and refueling area.

1.11 Fuel Piping

The refueling pump is to be arranged to connect to only one tank at a time. Piping between the refueling pump and the tank is to be as short as practicable and protected against damage. Fuel piping is to be of steel or equivalent material and to comply with the provisions of 4-6-4/13.7.1 and 4-6-4/13.7.2 of the *Steel Vessel Rules*. The piping system and all equipment used during refueling operation are to be electrically bonded.

1.13 Fuel Storage and Refueling Systems Installed in Enclosed Spaces

1.13.1 Machinery Spaces

Helicopter refueling facilities for fuel with a flash point of 60°C or less are not to be installed in machinery spaces.

1.13.2 Arrangements of the Enclosed Space

The fuel storage and refueling compartment is to be bounded by gas-tight bulkheads and decks. Access to this compartment is to be from the open deck only, which may be by means of a trunk. There is to be no access to this compartment from other compartments.

1.13.3 Machinery and Electrical Installations

In general, the compartment containing refueling facilities is to be regarded as having the same fire and explosion hazards as ro-ro cargo space, see Section 5C-10-4 of the *Steel Vessel Rules*. Specifically, the following provisions of Section 5C-10-4 of the *Steel Vessel Rules* are to be met:

- 5C-10-4/3.5.1: for ventilation capacity of the compartment.
- 5C-10-4/3.7.2(a) and 5C-10-4/3.7.2(b): for acceptable certified safe equipment and alternative electrical equipment in the compartment.
- 5C-10-4/3.7.2(c): for exhaust fan and ducting.
- 5C-10-4/3.9.1 and 5C-10-4/3.9.2: for bilge system of the compartment.

1.13.4 Storage Tanks

1.13.4(a) Independent tanks. Independent fuel tanks may be installed in the same compartment as the refueling system. The tank, vents, means of sounding and valves are to comply with 3/1.7.

1.13.4(b) Structural tanks. Fuel tanks may be integral with the vessel's structure. Cofferdams (see Part 5C, Chapter 2 of the *Steel Vessel Rules*) are to be fitted to separate such fuel tanks from machinery spaces, cargo spaces, accommodation, service spaces and other spaces containing a source of ignition. The compartment containing the refueling equipment, ballast tanks and fuel oil tanks containing fuel oil having a flash point of more than 60°C may be regarded as a cofferdam. Tank vents, means of sounding and outlet valves are to be as in 3/1.13.4(a). Particular attention is to be directed to the height of the tank vent/overflow with respect to the design head of the tank. Overflows, where fitted, are to comply with 4-6-4/9.5.5 of the *Steel Vessel Rules*.

1.15 Fire Extinguishing System

Fixed fire extinguishing systems are to be fitted to protect helicopter fuel storage and refueling equipment areas (or compartments), in accordance with the provisions of 4/1.3 and 4/1.5.

3 Steel Vessels (Under 90 meters in Length) and Liftboats

The following requirements for helicopter refueling systems apply to steel vessels under 90 meters in length and to liftboats.

3.1 Fuels with Flash Point Above 60°C (140°F)

When fixed helicopter fuel storage and pumping systems are provided and the flash point of the fuel is above 60°C (140°F), closed cup test, the installation is to comply with 4-4-4/1 and, 4-4-4/3 of the *Under 90m Rules* and 3/3.3.5.

3.3 Fuels with Flash Point at or Below 60°C (140°F) – Installations on an Open Deck

3.3.1 General

The designated fuel storage and refueling areas are to be suitably isolated from areas which contain a source of vapor ignition, escape routes and embarkation stations, and are not to be located on landing areas. The storage and refueling areas are to be permanently marked as an area where smoking and open flames are not permitted.

3.3.2 Tanks

Fixed fuel storage tanks are to be of metal construction. Mounting, securing arrangements and electrical bonding of the storage tank and refueling system are to be approved.

3.3.3 Vents and Sounding

Fuel storage tank venting and sounding arrangements are to comply with 4-4-3/9.5, 4-4-3/9.7, 4-4-4/7.5 and 4-4-3/13 of the *Under 90m Rules*.

3.3.4 Tank Valves

Fuel storage tank outlet valves are to be provided with a means of remote closure. Means are also to be provided for remote shutdown of the refueling pumps.

3.3.5 Spill Containment

To contain spillage and retain fire extinguishing agents, a coaming of at least 150 mm (6 in.) in height is to be provided. The coaming is to surround the fuel storage area, which consists of the fuel tank, associated piping and any pumping unit adjacent to the storage tank. Where the pumping unit is remote from the tank, a separate coaming is to be provided around the pumping unit.

Drainage is to be provided for the area enclosed by the coaming, complying with the following:

- i) The area within the coaming is to be sloped toward the drain line.
- ii) Drainage from the area within the coaming is to be led through a valve designed for selective output (e.g., 3-way valve) either to a holding tank complying with 3/3.3.2 and 3/3.3.3 above or directly overboard. No other valves may be fitted in the drain line.
- iii) The drain line cross sectional area is to be at least twice that of the fuel storage tank outlet connection.

Coamings not provided with drainage arrangements in accordance with the above are to be sized to contain the full volume of the fuel storage tank plus 150 mm (6 in.) of foam.

3.3.6 Electrical Equipment (2008)

All electrical equipment installed within 3 meters (10 ft) of either the tank vent outlet or the pumping/refueling equipment is to be of a certified safe type. Electrical equipment installed may be any of the types indicated in 4-6-3/11.1.1 of the *Under 90m Rules* and is to be IEC Publication 60079 group IIA class T3.

3.5 Fuels with Flash Points at or Below 60°C (140°F) – Installation within Enclosed Spaces

3.5.1 Independent Tanks

Fuel storage tanks and their venting and sounding arrangements are to comply with 3/3.3.2 and 3/3.3.3. The valving arrangements on the tanks are to comply with 4-4-4/3.7 of the *Under 90m Rules*.

3.5.2 Integral Tanks

The venting and sounding arrangements for integral tanks are to comply with 3/3.3.3. Overflow and valving arrangements are to comply with 4-4-3/11 and 4-4-4/3.7 of the *Under 90m Rules*, respectively. Cofferdams meeting the requirements of 5C-2-1/5.3 of the *Steel Vessel Rules* are to be provided to separate fuel tanks from the spaces mentioned therein.

3.5.3 Access Arrangements

The access to the fuel storage and refueling compartment is to be from the open deck by means of a trunk, if necessary. The compartment is to be bounded by gas tight bulkheads/decks and there is to be no direct access from any other compartment to the fuel storage and refueling compartment or access trunk.

3.5.4 Electrical Equipment (2008)

Electrical equipment installed in the refueling pump room and the space in which an independent helicopter fuel tank storage is located is to be of a certified safe type. All electrical equipment installed within three (3) meters (10 ft) of the tank vent outlet is to be of a certified safe type. Electrical equipment installed may be any of the types indicated in 4-6-3/11.1.1 of the *Under 90m Rules* and is to be IEC Publication 60079 group IIA class T3.

3.5.5 Pumps

Fuel pumps for helicopter refueling are to comply with 4-4-7/17 of the *Under 90m Rules* and are to be provided with remote shut-down.

3.5.6 Piping

Helicopter refueling piping systems are to comply with 4-4-7/3.17 of the *Under 90m Rules*.

3.5.7 Bilge/Drainage System

Provision is to be made for drainage of the refueling pump room and cofferdams. A separate bilge pump, ejector or a bilge suction from a refueling pump may be provided for this purpose. The arrangements are to be in accordance with 4-4-7/5.17 of the *Under 90m Rules*.

3.5.8 Ventilation

Systems for the refueling pump room and the space in which an independent helicopter fuel tank is located are to comply with 4-6-6/1.13.1 of the *Under 90m Rules*.

5 Steel Barges

The following requirements for helicopter refueling systems apply to steel barges.

5.1 Helicopter Fuel Oil Storage and Transfer Facilities

5.1.1

A designated area is to be provided for the storage of fuel tanks and transfer facilities which are to be as remote as is practicable from accommodation spaces, escape routes and embarkation stations, and suitably isolated from areas containing a source of vapor ignition.

The storage and transfer area is to be permanently marked as an area where smoking and open flames are not permitted.

5.1.2

Fixed fuel storage tanks are to be of metal construction. Special attention is to be given to the design, mounting, securing arrangement and electrical bonding of the storage tank and the fuel transfer system.

5.1.3

Tank vents are to be sized in accordance with 4-1-2/5 of the *Barge Rules*, API Standard 2000, "Venting Atmospheric and Low-Pressure Storage Tanks," or other approved criteria. Vent outlets are to be fitted with corrosion resistant flame screens and are to be located such that vapors will disperse freely.

5.1.4

Storage tank outlet valves are to be provided with a means of remote closure in the event of fire. Means are also to be provided for remote shutdown of the fuel transfer unit.

5.1.5

The helicopter deck is to have drainage facilities to prevent the collection of liquids and prevent liquids from spreading to or falling on other parts of the barge having regard to the use of fire-fighting equipment and the possible spillage of fuel.

5.1.6

To contain spillage and retain fire extinguishing agents, a coaming at least 150 mm (6 in.) in height is to be provided. The coaming is to surround the fuel storage area, which consists of the fuel tank, associated piping and any pumping unit adjacent to the storage tank. Where the pumping unit is remote from the tank, a separate coaming around the unit is to be provided. A coaming will be required only around the fuel pumping unit where the installation is such that the fuel storage tank is cantilevered from the barge and arranged to be jettisoned.

Drainage is to be provided for the area enclosed by the coaming and complying with the following:

- i) The area within the coaming is to be sloped toward the drain line.
- ii) Drainage from the area within the coaming is to be led through a valve designed for selective output (e.g., 3-way valve) either to a holding tank complying with 3/5.1.2 and 3/5.1.3 or directly overboard. No other valves may be fitted in the drain line.
- ii) The drain line cross-sectional area is to be at least twice that of the fuel storage tank outlet connection.

Coamings not provided with drainage arrangements, in accordance with the above, are to be sized to contain the full volume of the fuel storage tank plus 150 mm (6 in.) of foam.

5.1.7

Tanks and associated equipment are to be protected against physical damage and from a fire in an adjacent space or area.

5.1.8

The fuel pumping unit is to be connected to one tank at a time and the piping between the tank and the pumping unit is to be of steel or equivalent material, as short as possible and protected against damage.

5.1.9

Fire-extinguishing arrangements for protection of the designated area are to be submitted for review.

5.3 Helicopter Fuel Oil Pumping Arrangements

5.3.1

Electrical fuel pumping units and associated control equipment are to be of a type suitable for the location and potential hazard.

5.3.2

Fuel pumping units are to incorporate a device which will prevent over-pressurization of the delivery or filling hose.

5.3.3

The procedures and precautions during refueling operations are to be in accordance with good recognized practice.

5.3.4

Attention is to be paid to the electrical bonding of all equipment used in refueling operations.

5.3.5

“NO SMOKING” signs are to be displayed at appropriate locations.

7 Mobile Offshore Drilling Units

The following requirements for helicopter refueling systems apply to Mobile Offshore Drilling Units.

7.1 General

Fixed fuel storage and transfer facilities are to comply with the following:

7.1.1 Isolation

Fuel storage and transfer facilities are to be remote or suitably isolated from areas which contain a source of vapor ignition and are not to be located on landing areas. The storage and transfer area is to be permanently marked as an area where smoking and open flames are not permitted.

7.1.2 Hazardous Areas

The requirements for hazardous areas are applicable for fuel with a flash point at or below 60°C (140°F) close cup test. Open spaces within 3 m (10 ft) of the refueling equipment and within 3 m (10 ft) of the storage tank vent outlets are to be regarded as hazardous areas. The first 1.5 m (5 ft) is to be regarded a Zone 1 hazardous area and the second 1.5 m (5 ft) is to be regarded a Zone 2 hazardous area.

Enclosed spaces containing refueling equipment or storage tank vents are to be regarded as Zone 1 hazardous areas. See 4-3-3/9 of the *MODU Rules* for acceptable certified safe equipment and is to be IEC Publication 60079 group IIA class T3. Enclosed spaces are to meet the following provisions.

7.1.2(a) Ventilation Capacity. The enclosed space is to be provided with an effective power ventilation system sufficient to provide at least six air changes per hour.

7.1.2(b) Exhaust Ventilation Duct and Fan. The exhaust duct is to be regarded as a Zone 1 hazardous area and the outlet from any exhaust duct is to be sited in a safe location, having regard to other possible sources of ignition. See 4-3-6/3.3ii) and 4-3-6/3.5vii) of the *MODU Rules*. Exhaust fans are to be of non-sparking construction complying with 4-3-3/9.7 of the *MODU Rules*.

7.1.2(c) Dewatering System. Where a gravity drain system is fitted, the system is to comply with the provisions of 4-2-2/23 of the *MODU Rules*. Where a bilge pumping system is fitted, the system is to comply with the provisions of 4-2-4/1 through 4-2-4/7 of the *MODU Rules* as applicable.

7.1.3 Fuel Storage Tank Construction

Fixed fuel storage tanks are to be of approved metal construction. Special attention is to be given to the design, mounting, securing arrangement and electrical bonding of the storage tank and the fuel transfer system.

7.1.4 Fuel Storage Tank Vents

Tank vents are to be sized in accordance with 4-2-3/1.7 of the *MODU Rules*, API Standard 2000, "Venting Atmospheric and Low-Pressure Storage Tanks", or other approved criteria. Vent outlets are to be located such that vapors will disperse freely.

7.1.5 Fuel Storage Tank Valves

Storage tank outlet valves are to be provided with a means of remote closure in the event of fire. Means are also to be provided for remote shutdown of the fuel transfer unit.

7.3 Drainage Arrangements

Helicopter decks are to be arranged and provided with means to prevent collection of liquids and to prevent liquids from spreading to or falling on other parts of the unit.

7.5 Spill Containment

To contain spillage and retain fire extinguishing agents, a coaming at least 150 mm (6 in.) in height is to be provided. The coaming is to surround the fuel storage area, which consists of the fuel tank, associated piping and any pumping unit adjacent to the storage tank. Where the pumping unit is remote from the tank, a separate coaming around the unit is to be provided. A coaming will be required only around the fuel pumping unit where the installation is such that the fuel storage tank is cantilevered from the platform and arranged to be jettisoned.

Drainage is to be provided for the area enclosed by the coaming complying with the following:

7.5.1

The area within the coaming is to be sloped toward the drain line.

7.5.2

Drainage from the area within the coaming is to be led through a valve designed for selective output (e.g., three-way valve) either to a holding tank complying with 3/7.1.2 and 3/7.1.3 or directly overboard. No other valves may be fitted in the drain line.

7.5.3

The drain line cross sectional area is to be at least twice that of the fuel storage tank outlet connection.

Coamings not provided with drainage arrangements in accordance with the above are to be sized to contain the full volume of the fuel storage tank plus 150 mm (6 in.) of foam.



SECTION 4 Fire Safety Systems

1 Steel Vessels and Liftboats

The following requirements for fire safety systems apply to steel vessels (other than barges) and liftboats.

1.1 Application

For each helicopter deck onboard a vessel designated for helicopter operations, a fire fighting system and equipment complying with 4/1.3 and 4/1.5, as applicable, are to be provided.

A helicopter deck (helideck) is a purpose-built helicopter landing area on a vessel including all structure, fire fighting appliances and other equipment necessary for the safe operation of helicopters, but not those areas for occasional or emergency helicopter operations (e.g., circle H marked on hatch covers for drop-off/pickup of pilot). A helicopter facility is a helideck including any refueling and hangar facility.

1.3 Provisions for Helicopter Deck

1.3.1 Hoses and Nozzles

At least two combination solid stream and water spray nozzles and hoses sufficient in length to reach any part of the helicopter deck are to be provided.

1.3.2 Portable Extinguishers

The helicopter deck is to be protected by at least two dry powder extinguishers of a total capacity of not less than 45 kg (100 lb).

1.3.3 Back-up System

A back-up fire fighting system is to be provided consisting of CO₂ extinguishers of a total capacity of not less than 18 kg (40 lb) or equivalent, one of these extinguishers being equipped so as to enable it to reach the engine area of any helicopter using the helicopter deck. The back-up system is to be located so that the equipment would not be vulnerable to the same damage as the dry powder extinguisher required by 4/1.3.2.

1.3.4 Fixed Foam System

A suitable fixed foam fire extinguishing system, consisting of monitors or hose streams or both, is to be installed to protect the helicopter landing area in all weather conditions in which helicopters can operate. The system is to be capable of delivering foam solution at a discharge rate in accordance with the following table for at least five minutes. The operation of the foam system is not to interfere with the simultaneous operation of the fire main.

Category	Helicopter Overall Length, L_H	Discharge Rate	
		Liters/min	gpm
H1	$L_H < 15 \text{ m (49 ft)}$	250	66
H2	$15 \text{ m (49 ft)} \leq L_H < 24 \text{ m (79 ft)}$	500	132
H3	$24 \text{ m (79 ft)} \leq L_H < 35 \text{ m (115 ft)}$	800	211

The foam agent is to meet the performance standards for Level B foam in the International Civil Aviation Organization’s Airport Services Manual (Part 1 Chapter 8, Paragraph 8.1.5, Table 8-1) and be suitable for use with sea water.

1.3.5 Fireman’s Outfits

In addition to the fireman’s outfits required in 4-7-3/15.5.2 of the *Steel Vessel Rules*, two additional sets of fireman’s outfits are to be provided and stored near the helicopter deck.

1.3.6 Other Equipment

The following equipment is to be provided near the helicopter deck and is to be stored in a manner that provides for immediate use and protection from the elements:

- Adjustable wrench
- Fire resistant blanket
- Bolt cutters with arm length of 60 cm (24 in.) or more
- Grab hook or salving hook
- Heavy duty hack saw, complete with six spare blades
- Ladder
- Lifeline of 5 mm ($3/16$ in.) diameter \times 15 m (50 ft) length
- Side cutting pliers
- Set of assorted screwdrivers
- Harness knife, complete with sheath

1.5 Provisions for Enclosed Helicopter Facilities

Hangars, refueling and maintenance facilities are to be treated as machinery space of category A with regard to structural fire protection, fixed fire-extinguishing system and fire detection system requirements. See 4-7-2/1 of the *Steel Vessel Rules*.

1.7 Operation Manual

Each helicopter facility is to have an operation manual, including a description and a checklist of safety precautions, procedures and equipment requirements. This manual may be part of the vessel's emergency response procedures.

3 Steel Barges

The following requirements for fire safety systems apply to steel barges.

3.1 Fire Fighting for Helicopter Landing Areas with No Refueling Capabilities and Facilities for Winching Only

3.1.1 Hoses and Nozzles

At least two approved combination solid stream and water spray nozzles and detachable applicators and hoses sufficient in length to reach any part of the helicopter landing or winching area are to be provided.

3.1.2 Portable Extinguishers

The helicopter landing or winching area is to be protected by approved dry powder extinguishers of a total capacity of not less than 45 kg (100 lb).

3.1.3 Back-up System

A back-up fire-fighting system is to be provided, consisting of CO₂ extinguishers of a total capacity of not less than 18 kg (40 lb) or equivalent, one of these extinguishers being equipped so as to enable it to reach the engine area of any helicopter using the landing or winching area. The back-up system is to be located so that the equipment would not be vulnerable to the same damage as the dry powder extinguishers required by 4/3.1.2.

3.3 Fire Fighting for Helicopter Landing Areas with Refueling Capabilities

3.3.1 Fire-Fighting Systems

A fire-fighting system, as required by 4/3.1, is to be provided and arranged so as to adequately protect both the helicopter landing area and helicopter fuel storage areas.

3.3.2 Fixed-Foam System

A fixed-foam fire-extinguishing system, consisting of monitors or hose streams or both, is to be installed to protect the helicopter landing area and fuel storage areas. The helicopter landing area is the area contained within a circle of diameter D where D is the distance, in m (ft), across the main rotor and tail rotor in the fore and aft line of a helicopter with a single main rotor and across both rotors for a tandem rotor helicopter or the full area of the deck, whichever is less. The system is to be capable of delivering foam solution at a rate of 6.0 liters per square meter per minute (0.15 gpm per square foot) for protein foam or 4.1 liters per square meter per minute (0.10 gpm per square foot) for aqueous film forming foam (AFFF) of the areas protected for at least five minutes. The operation of the foam system is not to interfere with the simultaneous operation of the fire main.

5 Mobile Offshore Drilling Units

The following requirements for fire safety systems apply to mobile offshore drilling units.

5.1 General

Where areas of a unit are designated for helicopter operations, details of the facilities are to be submitted and the firefighting systems of 4/5.3 and 4/5.5 are to be provided and stored near the access to those areas.

Deckhouse tops directly below helicopter decks are to have no openings. See 3/7.3 for helicopter deck drainage.

5.3 Helicopter Decks with No Refueling Capabilities

5.3.1 Hoses and Nozzles

At least two approved combination solid stream and water spray nozzles and detachable applicators and hoses sufficient in length to reach any part of the helicopter deck are to be provided.

5.3.2 Portable Extinguishers

The helicopter deck area is to be protected by at least two approved dry powder extinguishers of a total capacity of not less than 45 kg (100 lb). At least one portable extinguisher is to be located at each helicopter deck access point.

5.3.3 Back-up System

A back-up firefighting system is to be provided, consisting of CO₂ extinguishers of a total capacity of not less than 18 kg (40 lb) or equivalent, one of these extinguishers being equipped so as to enable it to reach the engine area of any helicopter using the deck. The back-up system is to be located so that the equipment would not be vulnerable to the same damage as the dry powder extinguishers required by 4/5.3.2.

5.5 Helicopter Decks with Refueling Capabilities

5.5.1 Firefighting Systems

A firefighting system as required by 4/5.3 is to be provided and arranged so as to adequately protect both the helicopter deck and helicopter fuel storage areas.

5.5.2 Fixed-Foam System

A fixed-foam fire-extinguishing system consisting of monitors or hose streams or both is to be installed to protect the helicopter landing area and fuel storage areas. The helicopter landing area is the area contained within a circle of diameter "D" where "D" is the distance across the main rotor and tail rotor in the fore and aft line of a helicopter with a single main rotor and across both rotors for a tandem rotor helicopter or the full area of the deck, whichever is less. The system is to be capable of delivering foam solution at a rate of 6.0 liters per square meter per minute (0.15 gpm per square foot) for protein foam or 4.1 liters per square meter per minute (0.10 gpm per square foot) for aqueous film forming foam (AFFF) of the areas protected for at least five minutes. The pump is to be capable of maintaining a pressure of 7 bar (7 kgf/cm², 100 psi) at the foam installation.

5.7 Fire Pumps

5.7.1 Pump Capacity

Each of the fire pumps required by 5-2-2/1.1.1 of the *MODU Rules* is to have a capacity sufficient to deliver, while maintaining the pressure specified in 5-2-2/1.1.4 of the *MODU Rules*, two jets of water from nozzles that are connected to the two hydrants at which the pressure drop from the fire pump discharge pressure will be the greatest.

Where a fire pump is utilized for the foam system provided for helicopter deck protection, the pump is also to be capable of maintaining a pressure at the foam station as specified in 4/5.5.2. If the water consumption for any other fire protection or fire-fighting purposes exceed the rate of the helicopter deck foam installation, this consumption is to be the determining factor in calculating the required capacity of fire pumps.

In no case is the single pump capacity to be less than 25 m³/hr (110 gal/min.).

7 Additional Guidance

Additional guidance on fire safety systems may be found in the ABS *Guidance Notes on Fire-Fighting Systems*.

SECTION **5 Electrical Systems**

Electrical systems are to comply with the relevant ABS Rules or Guide. Specific requirements for electrical systems relating to helicopter decks are as follows:

1 Steel Vessels (Greater than 90 meters in Length)

The following requirements apply to electrical systems for helicopter decks on steel vessels greater than 90 meters in length

1.1 Hazardous Areas – Helicopter Refueling Facilities

A helicopter refueling facility, defined as an enclosed space containing components of the refueling pump/equipment; and open deck area within 3 m (10 ft) from ventilation outlet of enclosed space containing refueling pump/equipment, 3 m (10 ft) from tank vent outlet, and 3 m (10 ft) from refueling pump/equipment, is to be regarded as a hazardous area.

1.3 Certified Safe Equipment in Helicopter Refueling Facilities

Electrical equipment installed in areas defined for helicopter refueling facilities may be any of the types described below and is to be at least IEC Publication 60079 group IIA class T3.

Only electrical equipment of the following types complying with IEC Publication 60079, or other recognized standards, as described in 4-8-3/13, is to be considered for installation in hazardous areas.

- Intrinsically safe type (Ex i)
- Flameproof (explosion-proof) type (Ex d)
- Increased safety type (Ex e)
- Pressurized or purged type (Ex p)

Consideration is to be given to the flammability group and the temperature class of the equipment for suitability for the intended hazardous area, see IEC Publication 60079-20.

3 Steel Barges

The following requirements apply to electrical systems for helicopter decks on steel barges.

3.1 Permanent Equipment Grounding Arrangements

Where not obtained through normal construction, arrangements are to be provided to effectively ground all machinery, armored cables and metal structures of helicopter decks.

3.3 Emergency Source of Power

The power available is to be sufficient to supply for at least 18 hours all services necessary for safety in an emergency, particular attention being given to the following:

- i)* Navigation and special purpose lights and warning systems including helicopter landing lights
- ii)* Emergency lighting for helicopter landing decks

5 Mobile Offshore Drilling Units

The following requirements apply to electrical systems for helicopter decks on mobile offshore drilling units.

5.1 Grounding Arrangements

Where not obtained through normal construction, arrangements are to be provided to effectively ground metal structures of helicopter decks. See also 3/7.1.2 for fuel storage for helicopter facilities. Grounding arrangements are also to be provided for tending vessels.

5.3 Emergency Source of Power

The electrical power available is to be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously, and for equipment which can be shown as not being required in actual service to draw their rated loads. In the latter case, supporting details are to be submitted.

Having regard to starting currents and the transitory nature of certain loads, the emergency source of electrical power is to be capable of supplying emergency lighting on the helicopter landing deck perimeter for at least 18 hours.



SECTION **6** Survey Requirements

Surveys for helicopter decks and facilities are to comply with the *ABS Rules for Survey After Construction (Part 7)* and Part 6 of the *MODU Rules*. Specific survey requirements are as follows.

1 All Vessels other than Mobile Offshore Drilling Units

1.1 Annual Surveys – Hull

In addition to the applicable requirements of 7-3-2/1.1, the Annual Survey is to include the following.

Where areas of the vessel are designated for helicopter operations, the helicopter deck, deck supporting structure, deck surface, deck drainage, tie downs, markings, lighting, wind indicator, securing arrangements where fitted, safety netting or equivalent, access arrangements including emergency escape, and access for fire fighting and rescue personnel, are to be examined.

1.3 Special Periodical Surveys – Hull

In addition to the applicable requirements of 7-3-2/5.1, the Special Periodical Survey No. 1 is to include the following.

Special Periodical Survey No. 1 is to include compliance with all Annual Survey requirements and in addition, the following requirements are to be carried out as applicable, the parts examined and placed in satisfactory condition:

- Structures such as helicopter landing pads and their respective attachment to the deck or hull.

1.5 Annual Surveys – Machinery

Where areas of the vessel are designated for helicopter operations, the following, where fitted, are to be examined.

- Ventilation and electrical equipment.
- Fire fighting appliances
- Refueling and hanger facilities including fuel storage system, tanks, pumps, piping, valves, vent, sounding, overflow, spill containment and remote shutdowns.
- Operations manual for helicopter facilities, including checklist of safety precautions and procedures, is to be verified.

3 Mobile Offshore Drilling Units

3.1 Special Survey No. 1 – Hull

Special Survey No. 1 of Hull is to include compliance with the Annual Survey and Drydocking Survey requirements in Part 6, Chapter 2 of the *MODU Rules* and, in addition, the following requirements as listed below are to be carried out, as applicable, the parts examined, placed in satisfactory condition and reported upon. Nondestructive examination may be required of suspect areas.

- The hull or platform structure, including helicopter pad is to be examined externally and internally for damage, fractures or excessive wastage. Thickness gauging of plating and framing may be required where wastage is evident or suspected.
- Structures such as helicopter landing areas and their respective attachments to the deck or hull are to be examined.

3.3 Specific Survey on Self-Elevating Units After Ocean Transit Tow

A specific survey is to be carried out on self-elevating drilling units after the completion of an ocean transit tow. This survey should be carried out prior to elevating the unit and should include a comprehensive visual examination of the structure, including helicopter support structure, as well as surface nondestructive examination of critical locations. If the survey is carried out by the Owner and damage is found which affects or may affect classification, the Bureau is to be notified and arrangements are to be made for survey. If the survey is carried out by the Owner and no damages are found which affect or may affect classification, the Bureau is to be advised of the details of the tow, and a confirmation survey will be made at the next periodical survey.

5 Specific Vessel Types

5.1 Accommodation Barges and Hotel Barges

5.1 Annual Survey – Hull

In addition to the applicable requirements of 7-3-2/1.1, the Annual Survey – Hull is to include the following:

- The exposed parts of the hull, the deck, deck structures attached to the deck, including supporting structure, accessible internal spaces and equipment, which are to be generally examined and placed in satisfactory condition, as found necessary.

5.1.2 Survey After Ocean Transit Tow

For Accommodation Barges and Hotel Barge with self-elevating hulls, a specific survey is to be carried out on the self-elevating hull after the completion of an ocean transit tow. This survey should be carried out prior to elevating the hull and should include a comprehensive visual examination of the structure, including helicopter support structure, as well as surface nondestructive examination of critical locations. If the survey is carried out by the Owner and damage is found which affects or may affect classification, the Bureau is to be notified and arrangements are to be made for survey. If the survey is carried out by the Owner and no damages are found which affect or may affect classification, the Bureau is to be advised of the details of the tow and the inspection results, and a confirmation survey will be made at the next periodical survey.

5.3 Safety Standby Service Vessels

5.3.1 Annual Surveys and Surveys after Each Rescue Operation or Evacuation

At each Annual Survey, in addition to surveys of hull, machinery and equipment and after each Rescue Operation or Evacuation, the rescue equipment, safety equipment, arrangement, accommodation and assigned freeboard marks are to be examined and placed in satisfactory condition to the satisfaction of the attending Surveyor. The survey is also to include the following, as applicable:

- Rescue and safety equipment, including the helicopter winching area, is to be examined and confirmed in satisfactory operating condition.
- Radio and communication equipment, including the VHF radio telephone with helicopter communications frequencies and helicopter beacon, is to be examined and confirmed in satisfactory operating condition.

5.5 Liftboats

5.5.1 Annual Surveys – Machinery

Where areas of the liftboat are designated for helicopter operations, the following, where fitted, are to be examined and found or placed in satisfactory condition.

- Access arrangements, ventilation and electrical equipment.
- Fuel storage and refueling system including tank, pumps, piping, valves, vent, sounding, overflow, spill containment, and remote shutdowns.

5.7 Floating Production Installations

5.7.1 Special Periodical Surveys – Hull

For column-stabilized vessels, the following are to be performed, as applicable, the parts examined, placed in satisfactory condition and reported upon:

- The helicopter pad is to be examined externally and internally for damage, fractures or excessive wastage.
- Applicable structures, such as helicopter landing areas and their respective attachments to the deck or hull.

5.9 Offshore LNG Terminals

5.9.1 Gravity-Based Terminals Annual Survey – Maintenance Records

Maintenance records are to be kept and made available for review by the attending Surveyor. The maintenance records will be reviewed to establish the scope and content of the required Annual and Special Periodical Surveys which are to be carried out by a Surveyor. During the service life of the unit, maintenance records are to be updated on a continuing basis. The operator is to inform the Bureau of any changes to the maintenance procedures and their frequencies as may be caused, for example, by changes or additions to the original equipment. The Surveyor may determine during his periodic survey if the changes are sufficient to warrant review by the ABS Engineering staff.

At each Annual Survey, in addition to a general review of the maintenance records and where applicable and required for Classification of the terminal, the Surveyor is to verify the effectiveness of the following items by visual examination and operational testing, as appropriate:

- i) *Safety Systems.* Where areas of the terminal are designated for helicopter operations and where fitted, the following are to be generally examined:
 - Access arrangements, ventilation, and electrical equipment.
 - Fuel storage and refueling system including tank, pumps, piping, valves, vent, sounding, overflow, spill containment and remote shutdowns.
- ii) *Hull Structure for Ship- or Barge-type Terminals.* Where areas of the terminal are designated for helicopter operations, the helicopter deck, deck supporting structure, deck surface, deck drainage and safety netting or equivalent are to be examined.

5.9.2 Floating Terminals Annual Survey – Maintenance Records

- i) *Safety Systems.* Where areas of the terminal are designated for helicopter operations and where fitted, the following are to be generally examined:
 - Access arrangements, ventilation, and electrical equipment.
 - Fuel storage and refueling system including tank, pumps, piping, valves, vent, sounding, overflow, spill containment and remote shutdowns.

5.11 Compressed Natural Gas Carriers

5.11.1 Annual Survey – Hull

- *Additional requirements for Vessels Age > 15 years:* Where areas of the CNG carrier are designated for helicopter operations, the helicopter deck, deck supporting structure, deck surface, deck drainage and safety netting or equivalent are to be examined.

APPENDIX 1 Summary of ABS Requirements

Vessels and Units Having Helicopter Decks and Facilities

