



RULES FOR BUILDING AND CLASSING

**MOBILE OFFSHORE UNITS
2018**

**PART 8
SPECIFIC UNIT TYPES**

(Updated July 2018 – see next page)

**American Bureau of Shipping
Incorporated by Act of Legislature of
the State of New York 1862**

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Updates

July 2018 consolidation includes:

- January 2018 version plus Notice No. 1

Rule Change Notice (2018)

The effective date of each technical change since 1993 is shown in parenthesis at the end of the subsection/paragraph titles within the text of each Part. Unless a particular date and month are shown, the years in parentheses refer to the following effective dates:

(2000) and after	1 January 2000 (and subsequent years)	(1996)	9 May 1996
(1999)	12 May 1999	(1995)	15 May 1995
(1998)	13 May 1998	(1994)	9 May 1994
(1997)	19 May 1997	(1993)	11 May 1993

Listing by Effective Dates of Changes from the 2018 Rules

Notice No. 1 (effective on 1 July 2018) to the 2018 Rules, is summarized below.

EFFECTIVE DATE 1 July 2018 – shown as *(1 July 2018)*
(based on the contract date for new construction between builder and Owner)

<i>Part/Para. No.</i>	<i>Title/Subject</i>	<i>Status/Remarks</i>
8-3-1/3.1	Accommodation Unit	To remove requirements for personnel on board during jacking or towing operations. (Incorporates Notice No. 1)

Specific Unit Types

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CHAPTER 1 Mobile Offshore Units

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CHAPTER 1 Mobile Offshore Units

SECTION 1 General

1 Application

These Rules apply to Mobile Offshore Units as defined in 3-1-1/1.1. Based on the hull and service type, mobile offshore units will be assigned appropriate notation described in 8-1-1/Table 1.

**TABLE 1
Class Notations**

<i>Hull Type</i>	<i>Service</i>	<i>Notation</i>	<i>Rule Reference</i>
Self-Elevating	Drilling	Self-Elevating Drilling Unit	MOU Rules
	Other Offshore Services	Self-Elevating Unit , Intended Service Notation as listed in 8-1/Table 2	MOU Rules
Column-Stabilized	Drilling	Column-Stabilized Drilling Unit	MOU Rules
	Other Offshore Services	Column-Stabilized Unit , Intended Service Notation as listed in 8-1/Table 2	MOU Rules
Ship-Type	Drilling	Drillship	MOU Rules, Drillship Guide
	Other Offshore Service	Offshore Support Vessel	Marine Vessel Rules
Barge	Drilling	Barge Drilling Unit	MOU Rules

Part 8 contains specific classification requirements for each type of Mobile Offshore Units as well as for specific machinery, equipment and systems installed onboard for the intended offshore services. These requirements on hull structure, stability, equipment, system, machinery, and fire safety are in addition to those contained in Part 3 through Part 5 of these Rules.

3 Class Notations

Mobile Offshore Units designed and equipped to the applicable requirements for at least one specialized functional service of Part 8 and other relevant sections of these Rules will be assigned the appropriate notation as listed in 8-1-1/Table 2 after the classification notation described in 1-2-2/1.1 and 1-2-2/1.3 of the *ABS Rules for Conditions of Classification – Offshore Units and Structures (Part 1)*.

Units intended for several functional services covered by Part 8 of these Rules may be assigned a combination of the class notations mentioned in 8-1-1/Table 1 to the discretion of ABS, provided that the specific requirements for each intended service are complied with. For example, a Mobile Offshore Unit capable of crane service, pipe laying would be assigned the classification **Crane Service, Pipe Laying Service**.

TABLE 2
Service Notations

<i>Service Notation</i>	<i>Services</i>	<i>Reference</i>
See 8-2-1/Table 1	Drilling	8-2
Accommodation Service	Accommodation	8-3
Crane Service	Crane Lifting of Heavy loads of 160 metric tons and above	8-4
Construction and Maintenance Service	Construction and Maintenance	8-5
Drilling Tender	Support Drilling Platform	8-6
Pipe laying Service	Pipe Laying	8-7
Cable Laying Service	Cable Laying	8-7
Wind IMR	Wind Turbine Installation, Maintenance and Repair	8-8

At the request of the Owner, Mobile Offshore Unit (MOU) having specialized service (e.g. well intervention, well stimulation and well test) may be considered for notation (e.g., **WI**, **WS** and **Well Test Service**) listed in 5D-1-1/Table 1 of *Marine Vessel Rules* if it complies with the relevant criteria.

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CHAPTER 2 Drilling Units

SECTION 1 General

1 Class Notation

Drilling units, as defined in 3-1-1/1.3, built to the requirements of this Chapter and other relevant Chapters of these Rules, will be assigned the notation as listed in 8-2-1/Table 1. The requirements in this Chapter are specific requirements for drilling units and are to be complied with in addition to those contained in Part 3 through Part 6 of these Rules.

TABLE 1
Mobile Offshore Drilling Unit Notation

<i>Hull Type</i>	<i>Notation</i>	<i>Hull Requirement</i>
Self-Elevating	Self-Elevating Drilling Unit	3-2-3
Column-Stabilized	Column-Stabilized Drilling Unit	3-2-4
Ship-Type	Drillship	3-2-5
Barge	Barge Drilling Unit	3-2-5

3 Structures

3.1 Substructures

Substructures supporting the drilling derrick, drill floor and associated equipment are to be analyzed, as required by 3-2-1/1. Stresses are not to exceed those permitted by 3-2-1/3.

3.1.1 Individual Loads

Individual loads to be considered are the operating loads specified by the owner or designer and should include, but are not limited to the following, as applicable.

- Dead load (Steel weight, fixed equipment)
- Floor load (personnel, moveable equipment, material)
- Snow or ice load
- Hook, setback, rotary table and riser tensioner loads

3.1.2 Combined Loads

Environmental loads due to wind, including severe storm wind load, are to be combined with the individual loads indicated to reflect the applicable operational requirements for the range of anticipated conditions. Loads due to unit motions are to be considered for all afloat conditions.

3.3 Substructure Supporting Arrangement

Moveable cantilevers¹ and skid beams² supporting substructures are to be analyzed as required by 3-2-1/1. Stresses are not to exceed those permitted by 3-2-1/3. Loads imposed on the hull structure are to include maximum reactions from the cantilever or skid beam.

Notes:

- 1 Moveable cantilever structures are those which extend beyond the hull structure during drilling operations.
- 2 Moveable skid beam structures are those which are fully supported by hull structure during drilling operations.

3.5 Pipe Racks

Pipe racks including the reinforcements for the hull are to be designed to adequately resist the load effects of drill pipes or risers imposed on the pipe rack supports in the severe storm, normal operating and transit conditions with the allowable stresses defined in 3-2-1/3. Considerations should also be given to the unit in damaged conditions, where the pipe racks are to withstand the load effects caused by the trim and heel of the unit with the allowable stresses defined in 3-2-1/3 in association with a factor of safety of 1.0.

5 Drilling Systems and Equipment

5.1 General

Systems and equipment used solely for operation of drilling systems and complying with an applicable recognized standard need not be in accordance with these Rules or the *Marine Vessel Rules*, except where specifically stated in these Rules.

5.1.1 CDS Notation (optional)

Drilling systems that have been designed reviewed and surveyed, in accordance with the *ABS Guide for the Classification of Drilling Systems (CDS Guide)*, will be classed and distinguished in the *Record* with the notation **CDS**.

5.1.2 Drilling Units without CDS Notation

Where the optional **CDS** notation is not requested, drilling systems and equipment complying with an applicable recognized standard, need not to comply with the *CDS Guide*. Reference is made to the list of typical recognized standards in Appendix 1 of the *CDS Guide*. Verification of compliance with such standards may include:

- Surveyor verification of manufacturer's affidavits of compliance, or equivalent documentation, mainly for equipment and components such as pumps, BOP's, valves, fittings, or motors,
- Design review and surveys after installation of specific assembled systems or sub-systems such as high pressure mud and cement piping, choke and kill manifold or hydraulic piping. The design review will be performed to verify compliance with the applicable recognized standard specified by the manufacturer.

Drilling systems and equipment that do not comply with an applicable recognized standard or that will be installed in a unit with **CDS** notation are to comply with the *CDS Guide*.

5.1.3 Essential Systems to Unit Safety

Irrespective of whether **CDS** notation is requested or not, the following safety systems and equipment when in drilling areas or related to drilling operations are to be in accordance with the requirements of these Rules:

- Hazardous area classification
- Electrical system circuit protection
- Electrical installations in classified areas
- Paint lockers, laboratory spaces and flammable material store rooms
- Emergency services

- Fire water system
- Fixed fire fighting systems, as applicable
- Portable and semi-portable extinguishers
- Emergency control stations
- Fire detection and alarm systems

5.1.4 References

5.1.4(a) *Essential Services*. For essential services related to drilling systems and equipment, see 4-1-1/3.5 and 4-1-1/Tables 3 and 4.

5.1.4(b) *Well Test Systems*. For requirements covering well test systems, see 8-2-1/5.3.

5.1.4(c) *Internal Combustion Engines for Drilling Operations*. For requirements covering internal combustion engines designed for drilling operation, see 8-2-1/7.

5.1.4(d) *Internal Combustion Engines installed in Hazardous Areas*. For requirements covering the installation of internal combustion engines in hazardous areas, see 4-3-6/11.

5.1.4(e) *Mud Tank Level Alarm*. For requirements covering the mud tank level alarm, see 8-2-1/11.9.

5.1.4(f) *Rotating Electrical Machines*. For requirements covering the certification of rotating electrical machines for essential services, see 6-1-7/5.

5.3 Well Test Systems

Drilling units with a notation assigned under the *ABS Guide for Well Test Systems (Well Test Guide)* are to be in full compliance with the applicable requirements of the Guide.

Drilling units without a notation assigned under the *Well Test Guide* are to comply with the requirements of Subsection 3/19 of the *Well Test Guide* when temporary well test systems are installed on board (less than 30 months). No notation will be added in such circumstances unless full compliance is demonstrated with the entire Section 3 of the *Well Test Guide*.

Drilling units fitted with permanent well test systems (30 months or more) are to comply with the requirements of Section 4 of the *Well Test Guide*.

7 Internal Combustion Engines Designed for Drilling Operations

In drilling units without **CDS** notation, internal combustion engines used solely for drilling operations need not be of approved type and need not be inspected at the plant of manufacture. Such equipment need only be provided with the safety provisions below and 4-2-6/9.

7.1 Crankcase Ventilation

7.1.1 General

Provision is to be made for ventilation of an enclosed crankcase by means of a small breather or by means of a slight suction not exceeding 25.4 mm (1 in.) of water. Crankcases are not to be ventilated by a blast of air. Otherwise, the general arrangements and installation are to be such as to preclude the possibility of free entry of air to the crankcase.

7.1.2 Piping Arrangement

Crankcase ventilation piping is not to be directly connected with any other piping system. Crankcase ventilation pipes from each engine are normally to be led independently to the weather. However, crankcase ventilation pipes from two or more engines may lead to a common oil mist manifold.

Where a common oil mist manifold is employed, the vent pipes from each engine are to be led independently to the manifold and fitted with a corrosion-resistant flame screen within the manifold. The arrangement is not to violate the engine manufacturer's recommendations for crankcase ventilation. The common oil mist manifold is to be accessible at all times under normal conditions and effectively vented to the weather. Where venting of the manifold to the weather is accomplished by means of a common vent pipe, the location of the manifold is to be as close as practicable to the weather such that the length of the common vent pipe is no greater than one deck height. The clear open area of the common vent pipe is not to be less than the aggregate cross-sectional area of the individual vent pipes entering the manifold, and the outlet to the weather is to be fitted with a corrosion-resistant flame screen. The manifold is also to be fitted with an appropriate draining arrangement.

7.3 Explosion Relief Valves

7.3.1 General

Explosion relief valves are to be installed on enclosed crankcases of all engines having a cylinder bore exceeding 200 mm (8 in.) or having a crankcase gross volume exceeding 0.6 m³ (21 ft³). The free area of each explosion relief valve is not to be less than 45 cm² (7 in²), and the total free area of all relief valves is to be not less than 115 cm² for each cubic meter (one square inch for each two cubic feet) of crankcase gross volume. The volume of the fixed parts in the crankcase may be deducted in estimating gross volume. The explosion relief valves are to be of the return-seating type, are to relieve the pressure readily at not more than 0.2 bar (0.2 kgf/cm², 3 psi) and are to close quickly in order to prevent an inrush of air. In the arrangement and location of valves, consideration is to be given to minimizing the danger from emission of flame.

7.3.2 Location of Valves

All engines of this category having a bore exceeding 200 mm (8 in.), but not exceeding 250 mm (10 in.), are to have at least one valve near each end. However, for engines with more than 8 crank throws, an additional valve is to be fitted near the middle of the engine. Engines having a bore exceeding 250 mm (10 in.), but not exceeding 300 mm (12 in.), are to have at least one valve in way of each alternate crank throw, with a minimum of two valves. Engines having a bore exceeding 300 mm (12 in.) are to have at least one valve in way of each main crank throw. Each one of the relief valves to be fitted as required above may be replaced by not more than two relief valves of smaller area, provided the free area of each valve is not less than 45 cm² (7 in²).

7.3.3 Additional Valves Required

Explosion relief valves are to be fitted in scavenge spaces in open connection to the cylinders for engines having a cylinder diameter greater than 230 mm (9 in.). Additional relief valves are to be fitted on separate spaces of the crankcase such as gear or chain cases for camshaft or similar drives when the gross volume of such spaces exceeds 0.6 m³ (21 ft³).

7.5 Fire Extinguishing Systems for Scavenge Manifolds

For crosshead type engines, scavenge spaces in open connection to the cylinder are to be permanently connected to an approved fire extinguishing system entirely separate from the fire extinguishing system of the engine room. A steam smothering system is acceptable for this purpose.

7.7 Warning Notices

Suitable warning notices are to be attached in a conspicuous place on each engine and are to caution against the opening of a hot crankcase for a specified period of time after shutdown based upon the size of the engine, but not less than 10 minutes in any case. Such notice is also to warn against restarting an overheated engine until the cause of overheating has been remedied.

7.9 Governor Control

All engines of this category are to be fitted with governors which will prevent the engines from exceeding the rated speed by more than 15%. For generator sets, see 6-1-3/3.3.1 and 6-1-3/3.5.1 for operating governors.

8 Automatic Air Intake Shut-off Valves

Automatic air intake shut-off valves or equivalent arrangement are to be provided for all internal combustion engines in order to prevent the uncontrolled overspeeding of the internal combustion engine in the event of ingestion of flammable gas. This requirement is applicable to all internal combustion engines including engines in hazardous areas, engines in non-hazardous areas and engines installed in enclosed machinery spaces.

8.1 Monitoring and Alarm

The automatic air intake shut-off valves or equivalent arrangements are to be monitored, such that upon activation, an audible and visible alarm is to be provided at a manned location.

8.3 Manually Activated Shutdowns

The following engines are not required to be provided with automatic air intake shut-off valves. When automatic air intake shut-off valves are not provided for these engines, arrangements for manually activated air intake shut-off valves are to be provided. The activation is to be from a remote and safe location.

When automatic air intake shut-off valves are not provided for these engines, arrangements for manually operated from a remote safe location air intake shut-off valves are to be provided.

- i) Engines driving an emergency generator.
- ii) Engines driving a firewater pump.
- iii) Engines driving a BOP accumulator system.
- iv) Engines driving cementing units.
- v) Engines providing air supply to divers or confined entry personnel.
- vi) Engines for escape capsules and lifeboats.

8.5 Equivalent Arrangements

Documentation of the arrangements are to be submitted in order to determine whether the arrangements can be considered to be equivalent to the automatic air intake shut-off valves.

8.7 Engines Installed in Enclosed Machinery Spaces

When internal combustion engines are installed in enclosed machinery spaces and the ventilation intakes for the space are provided with arrangements for detection of combustible gas [see 8-2-1/11.11vi)] as well as for closing the ventilation intakes for the space, such arrangements may be considered in accordance with 8-2-1/8.5. The documentation required by 8-2-1/8.5 is to include the method of closing the ventilation intakes being of substantial strength to withstand the force of the air being drawn into any running internal combustion engines within the enclosed machinery space.

9 Classification of Hazardous Areas Associated with Drilling Activities

The following hazardous areas are those which normally apply to offshore drilling units engaged in oil or gas exploration. Hazardous areas as specified may be extended or reduced depending on the actual arrangements in each case by use of windshields, special ventilation arrangements, structural arrangements (e.g., low deck head), etc. Hazardous areas arising from well testing equipment will be specially considered [See 1-2-5/1.15 of the *ABS Rules for Conditions of Classification – Offshore Units and Structures (Part 1)*].

9.1 Hazardous Areas Zone 0 Include:

- i) The internal spaces of closed tanks and piping of the mud circulating system between the well and the final degassing discharge (e.g., escape gas outlets),
- ii) The internal spaces of closed tanks and piping for oil [closed-cup flashpoint below 60°C (140°F)] or flammable gas and vapor as well as produced oil and gas,
- iii) Other spaces in which a flammable oil vapor-air mixture or a flammable gas-air mixture is present, continuously or for long periods.

9.3 Hazardous Areas Zone 1 Include:

- i) Enclosed spaces containing any part of the mud circulating system that has an opening into the spaces and is between the well and the final degassing discharge.
- ii) Outdoor or semi-enclosed locations within 1.5 m (5 ft) from the following: openings to equipment which is part of the mud system, as specified in 8-2-1/9.3i); any ventilation outlets from Zone 1 spaces; and any access to Zone 1 spaces, except where 4-3-6/7.1 or 4-3-6/7.5 applies.
- iii) Pits, ducts or similar structures in locations which otherwise would be Zone 2 but which are arranged so the dispersion of gas may not occur.
- iv) Enclosed spaces or semi-enclosed locations that are below the drill floor and contain a possible source of release of gas such as the top of a drilling nipple.
- v) Enclosed spaces that are on the drill floor and which are not separated by a solid floor from the spaces in 8-2-1/9.3iv).
- vi) Outdoor locations below the drill floor and within a radius of 1.5 m (5 ft) from a possible source of release, such as the top of a drilling nipple.

9.5 Hazardous Areas Zone 2 Include:

- i) Enclosed spaces which contain open sections of the mud circulating system from the final degassing discharge to the mud pump suction connection at the mud pit.
- ii) Outdoors locations within the boundaries of the drilling derrick up to a height of 3 m (10 ft) above the drill floor.
- iii) To the extent of their enclosure, semi-enclosed locations that are on the drill floor and which are not separated by a solid floor from the spaces in 8-2-1/9.3iv).
- iv) Semi-enclosed derricks to the extent of their enclosures above the drill floor or to a height of 3 m (10 ft) above the drill floor, whichever is greater.
- v) Semi-enclosed locations below and contiguous with the drill floor and to the boundaries of the derrick or to the extent of any enclosure which is liable to trap gases.
- vi) In outdoor locations below the drill floor, the areas within a radius of 1.5 m (5 ft) beyond the Zone 1 areas specified in 8-2-1/9.3vi).
- vii) The areas 1.5 m (5 ft) beyond the Zone 1 areas specified in 8-2-1/9.3ii) and beyond the semi-enclosed locations specified in 8-2-1/9.3iv).
- viii) Outdoor locations within 1.5 m (5 ft) of the boundaries of any ventilation outlet from Zone 2 spaces, or any access to Zone 2 spaces, except where 4-3-6/7.3 applies.
- ix) Air lock spaces between Zone 1 and non-hazardous space, in accordance with 4-3-6/7.5i).

9.7 Well Test Equipment at Outdoor Location

The area which includes the equipment and extends 3 m from the equipment's perimeter is regarded as Zone 2. See also the *ABS Guide for Well Test Systems*.

9.9 Mud Laboratory

Mud laboratories on drilling units are not considered as hazardous spaces provided the following conditions are complied with:

- i) The mud laboratory has no direct piping connection to the mud circulating system.
- ii) An independent mechanical exhaust ventilation system providing at least six (6) air changes per hour is provided to the mud laboratory.
- iii) Mud samples are not to be stored in the mud laboratory.
- iv) Proper precautions (e.g., warning notice) are to be taken to insure that the ventilation system of the mud laboratory is always on when mud sample analysis is underway.

9.11 Ventilation of Hazardous Areas

Enclosed hazardous spaces containing open active mud tanks are to be ventilated with high capacity mechanical venting systems capable of changing the air every two minutes. Other enclosed hazardous spaces containing active mud processing equipment are to be ventilated at a minimum rate of 12 air changes per hour.

11 Fire and Safety

11.1 Structural Fire Protection

11.1.1 General

In addition to complying with the requirements of Section 5-1-1 of these Rules. The exterior boundary of normally occupied superstructures, deckhouses enclosing accommodations and modular building, including any overhanging decks supporting such accommodations, are to be an "H-60" Class boundary for the whole of the portion which faces and is within 30 m (98 ft) of the center of the rotary table. The 30 m (98 ft) is measured with the rotary at its closest drilling position to the normally occupied permanent structures, modular building, and accommodation. If worst fire risk analysis indicates the radiant heat flux of exterior boundaries of such buildings are not exceeding 100 kw/m², "A-60" standard can be considered.

Where "A-60" Class boundary is required, an "A-0" Class boundary used in conjunction with a water curtain system designed to provide a density of at least 6.1 liters/min/m² (0.15 gpm/ft²) of the exposed surface area may be used as an equivalent means of meeting the "A-60" class rating.

The ventilation inlets and outlets and other space openings in the deckhouse and superstructure exterior boundaries are to be located as far away from the rotary table as practicable.

11.1.2 Protection of Accommodation Spaces, Service Spaces and Control Stations

Accommodation spaces, service spaces and control stations, in general, are not to be located adjacent to hazardous areas. However, where this is not practicable, an engineering evaluation is to be performed to verify that the level of fire protection and blast resistance of the bulkheads and decks separating these spaces from the hazardous areas are adequate for the likely hazard. A Risk Analysis is to be submitted for review addressing the possible fire and explosion hazardous and identifying the worst foreseen hazards (fire and/or explosion). Depending on the type of hazard as determined from the risk analysis a Fire Load Analysis and/or a Blast Analysis are to be submitted for review with the mitigation measures (where needed) to allow safe operations.

11.1.2(a) Where a blast analysis is needed based on the risk analysis, the analysis is to show for the worst foreseen blast scenario that the space is protected.

- i)* Plastic deformation of the spaces' structure is acceptable.
- ii)* Attention is to be paid to penetrations through the bulkheads such as doors and HVAC openings.
- iii)* No penetration of the blast overpressure is allowed to enter the space through the division panels. Overpressures of 0.07 bar (0.07 kgf/cm²; 1 psi) are allowable through penetrations of the division; the point of measurement of the overpressure is where the overpressure enters the open air of the space (i.e., the vent duct grill). Unmanned service spaces can have higher overpressures through penetrations if justified.
- iv)* Windows subject to blast overpressures are to remain intact.

For simplified blast analysis, the overpressure values in API RP 2FB, Table C.6.4.1 may be used. Justification for the level of congestion (congested/non-congested) that an area has must be provided. Justification on the duration of the assumed blast impulse must be provided.

11.1.2(b) Where it is shown that normally occupied spaces may be exposed to a radiant heat flux in excess of 100 kw/m², the bulkhead or deck should be constructed to at least an "H-60" standard.

11.1.2(c) Where a fire analysis is needed based on the risk analysis, the analysis is to show that for the worst foreseen fire scenario the following internal temperature and structural criteria:

- i) The temperature of the protected side of the fire division (bulkhead or deck) does not increase more than:
 - a) 139°C (282°F) on average above ambient temperature for the time period of the event, but need not exceed 120 minutes and
 - b) 180°C (356°F) at any point above ambient temperature for the time period of the event, but need not exceed 120 minutes
- ii) The structure of the division (bulkhead or deck) is to remain intact with the main structure of the vessel, and is to maintain its structural integrity for two (2) hours. Structural Integrity means that the structure will not fall under its own weight, nor will it crumble or break upon normal contact after exposure to a fire lasting two (2) hours.

Buildings with bulkheads and decks that are H-120 Class fire divisions facing hazardous areas would not need a fire analysis; thus, only blast loads would need to be considered. Division sides not facing the fire hazard but which share a common edge with a division that faces the hazard are to have a 3 meter extension of the H-120 Class fire rated division. See Chapter 2, Section 1 of the *ABS Rules for Building and Classing Facilities on Offshore Installations (Facilities Rules)* for the definition of “H-120” divisions.

11.3 Fixed Fire Fighting Systems on Drilling and Industrial Areas

11.3.1 Fixed Fire Extinguishing Systems on Drilling Area, Temporary Well Test Area, and Moonpool Area

The Drilling Area is the drill floor area extending to each corner of the derrick including choke & kill manifold. The following firefighting arrangement is to be provided for the area:

- i) A fixed water spray system is to be provided to protect drilling area and temporary well test area. The minimum water application rate is not less than 20.4 l/min/m² (0.5 gpm/ft²), or
- ii) At least two dual-purpose (jet/spray) fire monitors are to be installed to cover drilling area, well test area, and temporary well test area. The minimum capacity of each monitor is not less than 100 m³/h (440 gpm). The monitors may be operated either remotely or locally. Monitor arranged for local operation should be sited on an accessible protected position.

The above firefighting arrangement is also to be provided for both inside of moonpool and the banded area (coaming) surrounding to the moonpool when the bottom of the moonpool is submerged below waterline.

11.3.2 Fixed Fire Extinguishing Systems on Mud Processing Area

The Mud Processing Area includes:

- i) Spaces occupied by the open mud circulating system which contain hazardous areas, such as spaces containing gumbo box, shale shaker, degasser, desander, desilter, centrifuge, mud cleaner, etc.
- ii) Spaces with open-top mud pits which will be used for oil-based mud.

The following firefighting arrangement is to be provided for the area:

A suitable fixed foam system is to be provided. The system is to be capable of delivering foam solution at a rate of not less than 6.5 l/min/m² (0.16 gpm/ft²) [(4.1 l/min/m² (0.10 gpm/ft²) for Aqueous Film Forming Foam or Film-Forming Fluoroprotein Foam)] for 15 minutes. Alternatively, a gas fixed fire extinguishing system may be used for enclosed mud processing areas.

11.5 Portable Fire Extinguishers for Drilling Areas

As a minimum, portable and semi-portable extinguishers are to be provided in the quantities and locations indicated in 8-2-1/Table 2. In all cases, the selection of the fire extinguishing medium is to be based on the fire hazard for the space protected. The fire extinguishers are to be visible and readily accessible.

TABLE 2
Hand Portable Fire Extinguishers and Semi-Portable Fire Extinguishing Systems

<i>Space</i>	<i>Classification*</i>	<i>Quantity and Location</i>
Drill floor	C-II	2 required, one at each exit.
Mud pump room	C-II	1 required.
Mud pits and mud processing areas	B-II	1 for each enclosed space (travel distance to an extinguisher not to exceed 10 m (33 ft) for open space)

* See 5-2-4/Table 1.

11.7 Fire Detection and Alarm Systems at Drilling and Mud Processing Areas

Flame or thermal detectors are to be installed in open drilling and/or mud processing areas.

Smoke detectors may be used in enclosed mud processing areas.

11.9 Mud Tank Level Alarm

A suitable audible and visual alarm to indicate significant increase or decrease in the level of the contents of the active mud tanks is to be provided, both at the control station for drilling operations and at the mud tank.

11.11 Gas Detection and Alarm Systems

Fixed automatic combustible gas detection and alarm systems are to be provided for the following areas:

- i) Cellar deck
- ii) Drill floor
- iii) Mud pit area
- iv) Shale shaker area
- v) Enclosed spaces containing open components of the mud circulation system from the bell nipple to the mud pits.
- vi) Ventilation intakes of enclosed machinery spaces contiguous to hazardous areas and containing internal combustion engines and boilers, and
- vii) Ventilation intakes and near other openings of accommodation spaces

The gas detectors are to be connected to an audible and visual alarm system with indicators on the drill floor and at the required emergency control stations (See 8-2-1/11.17). The alarm system is to clearly indicate the location and concentration of the gas hazard. The combustible gas detectors are to alarm at not more than 25% and at 60% of the lower explosive limit (LEL).

In addition to the fixed automatic gas detection system, two portable combustible gas detectors are to be provided on the unit.

11.13 Hydrogen Sulfide Detection and Alarm

11.13.1 Areas for Protection

A fixed automatic hydrogen sulfide gas detection and alarm system are to be provided for the following areas:

- i) Drill area
- ii) Mud processing area, and
- iii) Well test area

11.13.2 Alarms

The detectors are to be connected to an audible and visual alarm system with indicators in main control room. The system is clearly to indicate where gas has been detected.

Low level alarm set at 10 ppm and high level alarm set not higher than 300 ppm are to be provided. The high level alarm is to activate the toxic gas (hydrogen sulfide) alarm in the general alarm system (see 5-2-5/1.3).

If the low level alarm at the main control point is unanswered within 2 minutes, the toxic gas (hydrogen sulfide) alarm and the helideck status light is to be automatically activated.

11.13.3 Portable hydrogen Sulfide Gas Detectors

At least two portable hydrogen sulfide gas monitoring devices should be provided on the unit.

11.15 Respiratory Protection Equipment for Hydrogen Sulfide

11.15.1 Self-contained Breathing Apparatus (SCBA)

A self-contained breathing apparatus (SCBA) positive-pressure/pressure-demand breathing equipment with full-face piece and rated for a minimum of 30 minutes is to be provided for each person in working areas where hydrogen sulfide may be encountered, and each person in other areas is to be provided with a SCBA rated for a minimum of 15 minutes, or

11.15.2 Air Line Breathing Equipment

Positive-pressure/pressure-demand air line breathing equipment coupled with a SCBA-equipped low pressure warning alarm and rated for a minimum of 15 minutes is to be provided for each person on board the unit.

Breathing air supply line stations are to be provided at least in the following areas:

- i) Living quarters
- ii) Muster/evacuation area
- iii) Drilling areas
- iv) Mud processing areas, and
- v) Other working areas

11.17 Emergency Control Stations

At least two emergency control stations are to be provided. One of the stations is to be located near the drilling console and the other station is to be at a suitable manned location outside of the hazardous areas. The control stations are to be provided with the following.

- Manually operated contact makers for actuating the general alarm system.
- An efficient means of communication between these stations and all locations vital to the safety of the unit.
- Emergency shut-down facilities. (See 4-3-5/7.1.1)
- Gas Detection and Alarm Panel (5-2-5/3)

11.19 Rotary Table Area

The area adjacent to the rotary table is to be free of openings through which gases or water can enter the hull structure. Any such openings that are necessary are to be equipped with quick-acting closing devices.

13 Surveys

For survey requirements, refer to applicable section of Part 7 of these Rules.

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CHAPTER 3 Accommodation Units

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PART

8

CHAPTER 3 Accommodation Units

SECTION 1 General

1 Class Notation

Accommodation units, as defined in 8-3-1/3.1, built to the requirements of this Chapter and other relevant chapters of these Rules will be assigned the notation of **Accommodation Service** after the classification notation described in 1-2-2/1.1 and 1-2-2/1.3. The requirements in this Chapter are specific requirements for accommodation units and are to be complied with in addition to those contained in Part 3 through Part 6 of these Rules.

3 Definitions

For the purpose of these rules, the terms have the following meaning unless stated otherwise.

3.1 **Accommodation Unit** (1 July 2018)

Within the application of these Rules, an *Accommodation Unit* is a mobile offshore unit primarily intended for the accommodation of more than 36 persons who are industrial personnel, engaged in some aspect of offshore or related employment, excluding members of the crew.

3.3 **Accommodation Spaces**

Accommodation Spaces are those used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, pantries containing no cooking appliances and similar spaces. Public spaces are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

3.5 **Industrial Personnel**

Industrial Personnel are individuals from the offshore or similar industry who are temporarily housed on the unit. These persons do not include members of the crew of the accommodation unit, but may include crew members or industrial personnel from other vessels, drilling units, offshore fixed platforms, etc.

3.7 **Crew**

Crew means all persons carried on board the accommodation unit to provide maintenance and operation of the unit, its machinery, systems and arrangements or to provide services for other persons onboard the unit.

5 Passive Fire Protection

5.1 **Structural Fire Protection**

In addition to complying with the requirements of Section 5-1-1, the following requirements apply to accommodation units.

5.1.1 Main Vertical Zones

Hull, superstructure and deckhouses are to be subdivided into two or more main vertical zones by "A" Class divisions having insulation values in accordance with 5-1-1/3.7.

5.1.1(a) The length or width of the main vertical zone is the maximum distance between the furthestmost points of the bulkheads bounding it.

5.1.1(b) In general, the mean length and width of the main vertical zone on any deck is not to exceed 40 m (131 ft 3 in.).

5.1.1(c) The length and width of main vertical zones may be extended to a maximum of 48 m (157 ft 5³/₄ in.) in order to bring main vertical zone bulkheads into line with subdivision bulkheads below or to accommodate a large public space extending for the entire length of the zone provided the total area of the main vertical zone on any deck is not greater than 1600 m² (17220 ft²).

5.1.1(d) As far as practicable, bulkheads forming the boundaries of the main vertical zones above the bulkhead deck are to be in line with watertight subdivision bulkheads immediately below the bulkhead deck.

5.1.1(e) Main vertical zone boundary bulkheads are to extend from deck to deck and to the shell or other zone boundaries.

5.1.3 Corridor Bulkheads

All corridor bulkheads not required to be "A" class divisions are to be "B" class divisions extending from deck to deck except:

- i) When continuous ceilings and linings are fitted on both sides of the bulkhead, the portion of the bulkhead behind the continuous ceiling or lining is to be of material which, in thickness and composition, is acceptable in the construction of a "B" class division, but which may be required to meet "B" class integrity standards only insofar as considered reasonable and practicable by the Administration;
- ii) In the case of a unit protected by an automatic sprinkler system complying with Chapter 7 of the *International Code for Fire Safety Systems (FSS Code)*, the corridor bulkheads of "B" class material may terminate at a ceiling in the corridor provided the ceiling is of material which, in thickness and composition, is acceptable in the construction of "B" class divisions. Such corridor bulkheads and ceilings are to meet "B" class integrity standards insofar as considered reasonable and practicable by the Administration. All doors and frames in such bulkheads are to be of noncombustible materials and constructed and erected to provide substantial fire resistance to the satisfaction of the Administration.

5.1.5 Exterior Boundaries of Accommodation Block

The exterior boundary of superstructures and deckhouses enclosing accommodations, including any overhanging decks supporting such accommodations, is to be an "A-60" Class boundary for the whole of the portion which faces and is within 30 m (98 ft) of any area in the adjacent drilling or production platform served by the accommodation unit where a hydrocarbon fire may arise. If the distance is more than 30 m (98 ft), but less than 100 m (328 ft), an "A-0" Class boundary is required.

Where "A-60" Class boundary is required, an "A-0" Class boundary used in conjunction with a water curtain system designed to provide a density of at least 6.1 liters/min/m² (0.15 gpm/ft²) of the exposed surface area may be used as an equivalent means of meeting the "A-60" class rating.

The ventilation inlets and outlets and other space openings in the deckhouse and superstructure exterior boundaries are to be located as far away from the adjacent drilling and production platform as practicable.

7 Active Fire Protection

In addition to complying with the requirements of Section 5-2-2, the following requirements apply to accommodation units.

7.1 Arrangement of Fire Water Supply

The arrangements for the ready availability of water supply are to be such that at least one effective jet of water is immediately available from any hydrant in an interior location and so as to ensure the continuation of the output of water by the automatic starting of one required fire pump. At interior locations, fire hoses are to be connected to the hydrants at all times.

If fitted with periodically unattended machinery spaces, provisions for fixed water fire-extinguishing arrangements for such spaces, equivalent to those required for normally attended machinery spaces, are to be provided.

7.3 Fixed Fire Detection and Fire Alarm Systems, and Fixed Automatic Sprinkler, Fire Detection and Fire Alarm Systems

There is to be installed throughout each separate vertical fire zone, in all accommodation and service spaces and, where it is considered necessary also in control stations, except spaces which afford no substantial fire risk such as void spaces, sanitary spaces, etc., either:

- i) A fixed fire detection and fire alarm system of an approved type and complying with the requirements of 4-7-3/11 of the *Marine Vessel Rules* and so installed and arranged as to detect the presence of fire in such spaces and provide smoke detection in corridors, stairways and escape routes within accommodation spaces; or
- ii) An automatic sprinkler, fire detection and fire alarm system of an approved type and complying with the requirements of 4-7-3/9 of the *Marine Vessel Rules* or equivalent and so installed and arranged as to protect such spaces, and in addition a fixed fire detection and fire alarm system of an approved type complying with the requirements of 4-7-3/11 of the *Marine Vessel Rules* and so installed and arranged as to provide smoke detection in corridors, stairways and escape routes within accommodation spaces.

9 Life-Saving Appliances and Equipment

Life-saving appliances and equipment are to comply with Chapter 10 of the *IMO Code for the Construction and Equipment of Mobile Offshore Drilling Units (IMO MODU Code)* and the relevant sections of the *International Life-Saving Appliance (LSA) Code*. If a Flag Administration requests that the unit complies with SOLAS instead of the IMO MODU Code, then the life-saving appliances and equipment are to comply with the SOLAS requirements.

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CHAPTER 4 Crane Units

SECTION 1 General

1 Class Notation

Crane units, as defined in 8-4-1/3.1, built to the requirements of this Chapter and other relevant chapters of these Rules will be assigned the notation of **Crane Service** after the classification notation described in 1-2-2/1.1 and 1-2-2/1.3. The requirements in this Chapter are specific requirements for crane units and are to be complied with in addition to those contained in Part 3 through Part 6 of these Rules.

3 Definitions

For the purpose of these Rules, the terms have the following meaning unless stated otherwise.

3.1 Crane Unit

Within the application of these Rules, a *Crane Unit* is a mobile offshore unit primarily intended for the lifting of heavy loads in oil drilling and production operations, offshore construction and/or salvage operations, with a lifting capacity of 160 metric tons and above.

5 Certification of Cranes

Any crane permanently installed on board the crane unit and intended for operations other than supply of provisions and maintenance of the unit is to be certified by ABS in accordance with Chapter 2 of the *ABS Guide for Certification of Lifting Appliances* or API Spec. 2C.

Mobile cranes not permanently attached to the unit structure, such as crawler cranes, are not required to be certified.

7 Crane Pedestal and Supporting Structure

The crane pedestal, when not covered by the crane certification, is to be designed in accordance with the recognized standard to which the crane is certified. Details and calculations are to be submitted for review.

In addition, crane pedestals are to be designed to resist motion-induced loads in severe storm, normal operating and transit conditions using the allowable stresses defined in 3-2-1/3, considering the operating limits of the crane.

Detail drawings of the foundation and supporting structure on which the crane and boom rest or other stowage arrangements are installed are to be submitted for review. The hull supporting structure is also to be designed to resist the design static and dynamic loading conditions of the crane, using the allowable stresses defined in 3-2-1/3. The boom rest or other stowage arrangements and their foundation and supporting structure are to be designed for the out-of-service loads as defined in 2-2/5.1.2 of the *ABS Guide for Certification of Lifting Appliances* or the recognized standard that the crane is certified to.

8 Supporting Structure for Deck Cargo

Foundations and supporting structure in way of deck cargo and permanently attached cargo-carrying structures are to be designed to adequately resist the load effects of the cargo in severe storm, normal operating and transit conditions using the allowable stresses defined in 3-2-1/3.

Consideration is also to be given to the unit in damaged conditions, where the structures above are to withstand the load effects of the cargo caused by the trim and heel of the unit in these damaged conditions, using the allowable stresses defined in 3-2-1/3 in association with a factor of safety of 1.0.

Tie-down or other securing arrangements are not included in the scope of Classification.

9 Stability

In addition to complying with the requirements of Part 3, Chapter 3, the following requirements apply to crane units.

9.1 Overturning Moment

In calculating overturning moments for crane units, the effect of the crane loads acting simultaneously with the maximum design wind force associated to the operation of the crane is to be determined. The full range of crane positions, elevations and weights is to be considered in order to investigate the most critical scenarios. The wind area of the deck cargo is to be considered in the calculation of the overturning moment.

When the crane unit is equipped to counter-ballast while lifting, the unit is to be able to withstand the sudden loss of the hook load in each condition of loading and operation. The free surface effects are to be considered for those tanks which are ballasted. Specific reference may be made to Part 8, Appendix 1, "Stability Criteria for Counter-Ballasted Crane Units".

9.3 Deck Cargo

Loading conditions in the operations manual are to include the effect of the deck cargo for each operating condition, using the estimated weight and the height of the center of gravity of the cargo based on the most severe loading assumptions. The loading conditions are to cover the full range of operating configurations, from no deck cargo on board to the maximum design deck load.

If the unit is intended to carry deck cargoes that may accumulate water, such as open cargo bins or open pipes, a free surface correction is to be applied to afloat conditions.

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CHAPTER 5 Construction and Maintenance Units

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CHAPTER 5 Construction and Maintenance Units

SECTION 1 General

1 Class Notation

Construction and maintenance units, as defined in 8-5-1/3.1, built to the requirements of this Chapter and other relevant chapters of these Rules will be assigned the notation of **Construction and Maintenance Service** after the classification notation described in 1-2-2/1.1 and 1-2-2/1.3. The requirements in this Chapter are specific requirements for Construction and maintenance units and are to be complied with in addition to those contained in Part 3 through Part 6 of these Rules.

3 Definitions

For the purpose of these Rules, the terms have the following meaning unless stated otherwise.

3.1 Construction and Maintenance Unit

Within the application of these Rules, a *Construction and Maintenance Unit* is a mobile offshore unit primarily intended for construction and maintenance activities in support of offshore mineral exploration and production operations.

5 Certification of Cranes

Any crane permanently installed on board the construction and maintenance unit and intended for operations other than supply of provisions and maintenance of the unit is to be certified by ABS in accordance with Chapter 2 of the *ABS Guide for Certification of Lifting Appliances* or API Spec. 2C. Alternatively, a certification of compliance with API Spec. 2C issued by a recognized certifying body is considered acceptable.

Mobile cranes not permanently attached to the unit structure, such as crawler cranes, are not required to be certified.

7 Crane Pedestal and Supporting Structure

The crane pedestal, when not covered by the crane certification, is to be designed in accordance with the recognized standard to which the crane is certified. Details and calculations are to be submitted for review.

In addition, crane pedestals are to be designed to resist motion-induced loads in severe storm, normal operating and transit conditions using the allowable stresses defined in 3-2-1/3, considering the operating limits of the crane.

Detail drawings of the foundation and supporting structure on which the crane and boom rest or other stowage arrangements are installed are to be submitted for review. The hull supporting structure is also to be designed to resist the design static and dynamic loading conditions of the crane, using the allowable stresses defined in 3-2-1/3. The boom rest or other stowage arrangements and their foundation and supporting structure are to be designed for the out-of-service loads as defined in 2-2/5.1.2 of the *ABS Guide for Certification of Lifting Appliances*.

8 Supporting Structure for Deck Cargo

Foundations and supporting structure in way of deck cargo and permanently attached cargo-carrying structures are to be designed to adequately resist the load effects of the cargo in severe storm, normal operating and transit conditions using the allowable stresses defined in 3-2-1/3.

Consideration is also to be given to the unit in damaged conditions, where the structures above are to withstand the load effects of the cargo caused by the trim and heel of the unit in these damaged conditions, using the allowable stresses defined in 3-2-1/3 in association with a factor of safety of 1.0.

Tie-down or other securing arrangements are not included in the scope of Classification.

9 Stability

In addition to complying with the requirements of Part 3, Chapter 3, the following requirements apply to construction and maintenance units.

9.1 Overturning Moment

In calculating overturning moments for construction and maintenance units, the effect of the crane loads acting simultaneously with the maximum design wind force associated with the operation of the crane is to be determined. The full range of crane positions, elevations and weights is to be considered in order to investigate the most critical scenarios. The wind area of the deck cargo is to be considered in the calculation of the overturning moment.

When the construction and maintenance unit is equipped to counter-ballast while lifting, the unit is to be able to withstand the sudden loss of the hook load in each condition of loading and operation. The free surface effects are to be considered for those tanks which are ballasted. Specific reference may be made to Part 8, Appendix 1 “Stability Criteria for Counter-Ballasted Crane Units”.

9.3 Deck Cargo

Loading conditions in the operations manual are to include the effect of the deck cargo for each operating condition, using the estimated weight and the height of the center of gravity of the cargo based on the most severe loading assumptions. The loading conditions are to cover the full range of operating configurations, from no deck cargo on board to the maximum design deck load.

If the unit is intended to carry deck cargoes that may accumulate water, such as open cargo bins or open pipes, a free surface correction is to be applied to afloat conditions.

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CHAPTER 6 Drilling Tenders

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CHAPTER 6 Drilling Tenders

SECTION 1 General

1 Class Notation

Drilling tenders, as defined in 8-6-1/3.1, built to the requirements of this Chapter and other relevant chapters of these Rules will be assigned the notation of **Drilling Tender** after the classification notation described in 1-2-2/1.1 and 1-2-2/1.3. The requirements in this Chapter are specific requirements for Drilling Tenders and are to be complied with in addition to those contained in Part 3 through Part 6 of these Rules.

3 Definitions

For the purpose of these Rules, the terms have the following meaning unless stated otherwise.

3.1 Drilling Tender

Within the application of these Rules, a *Drilling Tender* is a mobile offshore unit primarily intended as support to an offshore drilling platform. It may contain the power supply, circulating pumps (connected to the platform by hoses) and storage tanks, drill pipe racks, casing, cement, storage space, living quarters and generally, helicopter landing platform.

5 Pipe Racks

Pipe racks are to be complied with 8-2-1/3.5.

7 Hazardous Areas

Drilling tenders may temporarily install equipment on deck which creates hazardous areas. If any of the tender's intended modes of operation include hazardous equipment, arrangements are to be made to accommodate and operate such equipment safely. To this end, the area where such equipment will be installed is to be considered hazardous and electrical equipment, ventilation and access to adjacent spaces in this area are to be in accordance with 4-3-6/5 and 4-3-6/6 of these Rules. Alternatively, if the area where temporary hazardous equipment will be installed is not in compliance with these Rules, a procedure for making this area suitable for such equipment is to be developed and submitted for review.

9 Passive Fire Protection

9.1 Structural Fire Protection

In addition to complying with the requirements of Section 5-1-1, the following requirements apply to drilling tenders.

9.1.1 Exterior Boundaries of Accommodation Block

The exterior boundary of superstructures and deckhouses enclosing accommodations, including any overhanging decks supporting such accommodations, is to be an "A-60" Class boundary for the whole of the portion which faces and is within 30 m (98 ft) of any area in the adjacent drilling platform served by the drilling tender where a hydrocarbon fire may arise. If the distance is more than 30 m (98 ft), but less than 100 m (328 ft), an "A-0" Class boundary is required.

Where “A-60” Class boundary is required, an “A-0” Class boundary used in conjunction with a water curtain system designed to provide a density of at least 6.1 liters/min/m² (0.15 gpm/ft²) of the exposed surface area may be used as an equivalent means of meeting the “A-60” class rating.

The ventilation inlets and outlets and other space openings in the deckhouse and superstructure exterior boundaries are to be located as far away from the adjacent drilling platform as practicable.

9.1.2 Protection of Accommodation Spaces, Service Spaces and Control Stations

See 8-2-1/11.1.2.

CHAPTER 7 Pipe and Cable Laying Units

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CHAPTER 7 Pipe and Cable Laying Units

SECTION 1 General

1 Class Notation

Pipe and cable laying units, as defined in 8-7-1/3.1, built to the requirements of this Chapter and other relevant chapters of these Rules will be assigned the notation of **Pipe Laying Service or Cable Laying Service** after the classification notation described in 1-2-2/1.1 and 1-2-2/1.3. The requirements in this Chapter are specific requirements for Pipe and Cable Laying units and are to be complied with in addition to those contained in Part 3 through Part 6 of these Rules.

3 Definitions

For the purpose of these Rules, the terms have the following meaning unless stated otherwise.

3.1 Pipe Laying Unit

Within the application of these Rules, a *Pipe Laying Unit* is a mobile offshore unit primarily intended for subsea pipeline installation.

3.3 Cable Laying Unit

Within the application of these Rules, a *Cable Laying Unit* is a mobile offshore unit primarily intended for subsea cable installation.

5 Supporting Structure for Pipe or Cable Laying Devices

Detail drawings of the foundation and supporting structure on which the J-lay rig, stinger or other laying devices are installed are to be submitted for review. The hull supporting structure is also to be designed to resist the design static and dynamic loading conditions of the pipe or cable laying devices, using the allowable stresses defined in 3-2-1/3.

In addition, the foundation and supporting structure are to be designed to resist motion-induced loads in severe storm, normal operating and transit conditions using the allowable stresses defined in 3-2-1/3.

7 Pipe Racks and Cable Reel Support Structure

Pipe racks and cable reel support structure are to be complied with 8-2-1/3.5.

9 Stability

In addition to complying with the requirements of Part 3, Chapter 3, the following requirements apply to pipe or cable laying units.

9.1 Overturning Moment

In calculating overturning moments for pipe or cable laying units, the effect of the loads for the pipe or cable laying devices acting simultaneously with the maximum design wind force or maximum design current force, when submerged, is to be determined. When the pipe or cable laying device is movable from stowage to operating condition, the full range of laying device positions is to be considered in order to investigate the most critical scenarios.

9.3 Pipe Racks and Cable Reels

Loading conditions in the operations manual are to include the effect of the pipe racks and cable reels for each operating condition using the estimated weight and the height of the center of gravity of the cargo based on the most severe loading assumptions. The loading conditions are to cover the full range of operating configurations.

If the unit is intended to carry deck cargoes that may accumulate water, such as open cargo bins or open pipes, a free surface correction is to be applied to afloat conditions.

11 Conventionally Moored Units

Class notations **M** or **P**, as defined in 1-2-2/11, are required for units using position mooring equipment during pipe or cable laying operations.

13 Dynamically Positioned Units

An appropriate class notation for dynamic positioning systems, as defined in 1-1-3/5, is required for units using dynamic positioning during pipe or cable laying operations.

15 Pipe and Cable Laying Equipment and Systems

The arrangements of pipe and cable laying equipment and systems are to be in accordance with the provisions in Section 5D-8-4 and Section 5D-15-4 of the *Marine Vessel Rules*, respectively.

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CHAPTER 8 Wind Turbine Installation, Maintenance, and Repair Units

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CHAPTER 8 Wind Turbine Installation, Maintenance, and Repair Units

SECTION 1 General

1 Class Notation

Wind Turbine Installation, Maintenance and Repair units, as defined in 8-8-1/3.1, built to the requirements of this Chapter and other relevant chapters of these Rules will be assigned the notation of **Wind IMR** after the classification notation described in 1-2-2/1.1 and 1-2-2/1.3. The requirements in this Chapter are specific requirements for Wind Turbine Installation, Maintenance and Repair units and are to be complied with in addition to those contained in Part 3 through Part 6 of these Rules.

3 Definitions

For the purpose of these Rules, the terms have the following meaning unless stated otherwise.

3.1 Wind Turbine IMR Unit

Within the application of these Rules, a *Wind Turbine IMR Unit* is a mobile offshore unit primarily intended for the installation, maintenance, and repair of offshore wind turbines, including pile driving, tower installation, and nacelle and blade installation. Units may include various equipment to perform or support functions such as pile driving, installation, maintenance and repair of jacket, tower, nacelle and/or blade.

3.3 Deck Cargo

Deck Cargo includes wind turbine nacelles, towers, blades, and any other items which are installed in association with a wind power generation structure. It also includes any temporary structures such as racks, stands, or cradles which are not permanently attached to the unit.

5 Certification of Cranes

Any crane permanently installed on board the Wind Turbine IMR unit and intended for operations other than supply of provisions and maintenance of the unit is to be certified by ABS in accordance with Chapter 2 of the *ABS Guide for Certification of Lifting Appliances* or API Specification 2C.

Mobile cranes not permanently attached to the unit structure, such as crawler cranes, are not required to be certified.

Lifting appliances of types not considered in the above referenced standards will be subject to special consideration.

7 Crane Pedestal and Supporting Structure

The crane pedestal, when not covered by the crane certification, is to be designed in accordance with the recognized standard to which the crane is certified. Details and calculations are to be submitted for review.

In addition, crane pedestals are to be designed to resist motion-induced loads in severe storm, normal operating and transit conditions using the allowable stresses defined in 3-2-1/3, considering the operating limits of the crane.

Detail drawings of the foundation and supporting structure on which the crane and boom rest or other stowage arrangements are installed are to be submitted for review. The hull supporting structure is also to be designed to resist the design static and dynamic loading conditions of the crane, using the allowable stresses defined in 3-2-1/3. The boom rest or other stowage arrangements and their foundation and supporting structure are to be designed for the out-of-service loads as defined in 2-2/5.1.2 of the ABS *Guide for Certification of Lifting Appliances* or the recognized standard to which the crane is certified.

9 Supporting Structure for Pile Driving Equipment

If pile driving equipment is installed, detailed drawings of the foundation and supporting structure on which the pile driving rig and supporting equipment are installed are to be submitted for review. The hull supporting structure is also to be designed to resist the design static and dynamic loading conditions of the pile driving equipment using the allowable stresses defined in 3-2-1/3.

In addition, the foundation and supporting structure are to be designed to resist motion-induced loads in severe storm, normal operating and transit conditions using the allowable stresses defined in 3-2-1/3.

11 Supporting Structure for Deck Cargo

Foundations and supporting structure in way of deck cargo and permanently attached cargo-carrying structures such as blade racks are to be designed to adequately resist the load effects of the cargo in severe storm, normal operating and transit conditions using the allowable stresses defined in 3-2-1/3.

Consideration is also to be given to the Wind Turbine IMR unit in damaged conditions, where the structures above are to withstand the load effects of the cargo caused by the trim and heel of the unit in these damaged conditions, using the allowable stresses defined in 3-2-1/3 in association with a factor of safety of 1.0.

Tie-down or other securing arrangements are not included in the scope of the Wind Turbine IMR Classification.

13 Stability

In addition to complying with the requirements of Part 3, Chapter 3, the following requirements apply to Wind Turbine IMR units.

13.1 Overturning Moment

In calculating overturning moments for Wind Turbine IMR units, the effect of the operational loads acting simultaneously with the maximum design environmental force is to be determined. The full range of crane positions, elevations and weights is to be considered in order to investigate the most critical scenarios. The wind area of the deck cargo is to be considered in the calculation of the overturning moment.

When the Wind Turbine IMR unit is equipped to counter-ballast while lifting, the unit is to be able to withstand the sudden loss of the hook load in each condition of loading and operation. The free surface effects are to be considered for those tanks which are ballasted. Specific reference may be made to Part 8, Appendix 1, "Stability Criteria for Counter-Ballasted Crane Units".

13.3 Deck Cargo

Loading conditions in the operations manual are to include the effect of the deck cargo for each operating condition, using the estimated weight and the height of the center of gravity of the cargo based on the most severe loading assumptions. The loading conditions are to cover the full range of operating configurations, from no deck cargo on board to the maximum design deck load.

If the unit is intended to carry deck cargoes that may accumulate water, such as open cargo bins or open pipes, a free surface correction is to be applied to afloat conditions.

15 Surveys

For survey requirements, refer to applicable sections of Part 7 of these Rules.

In addition, surveys of cranes after construction are to be carried out in accordance with Chapter 2, Section 7 of the *ABS Guide for Certification of Lifting Appliances*.

PART
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APPENDIX 1 Stability Criteria for Counter-Ballasted Crane
Units

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PART

8

APPENDIX 1 Stability Criteria for Counter-Ballasted Crane Units

SECTION 1 General

1 Intact Stability after Loss of Crane Load

The following recommended criteria are based on crane operations taking place in favorable weather conditions on counter-ballasted column-stabilized crane units. The analysis should be carried out for the counter-ballast case when the unit is floating on even keel.

The maximum heeling moment developed by multiplying the weight of the hook load and boom by the horizontal distance from center of floatation at the selected draft to the hook load and boom center of gravity, considering the full range of crane elevations and weights, is to be determined. The resulting heeling moment is to be converted to a heeling arm at zero degrees by dividing it by the rig displacement. The heeling arm thus achieved is to be assumed constant with the inclination.

The righting arm curve is to be corrected for the increase in the vertical center of gravity due to the load. (The increase in the VCG is due to the boom being in the elevated position, and the hook load acting at the elevated end of the boom.).

- i) For any condition of loading, the first intercept of the heeling arm curve with the righting arm curve (equilibrium point) is to occur prior to submergence of the deck edge.

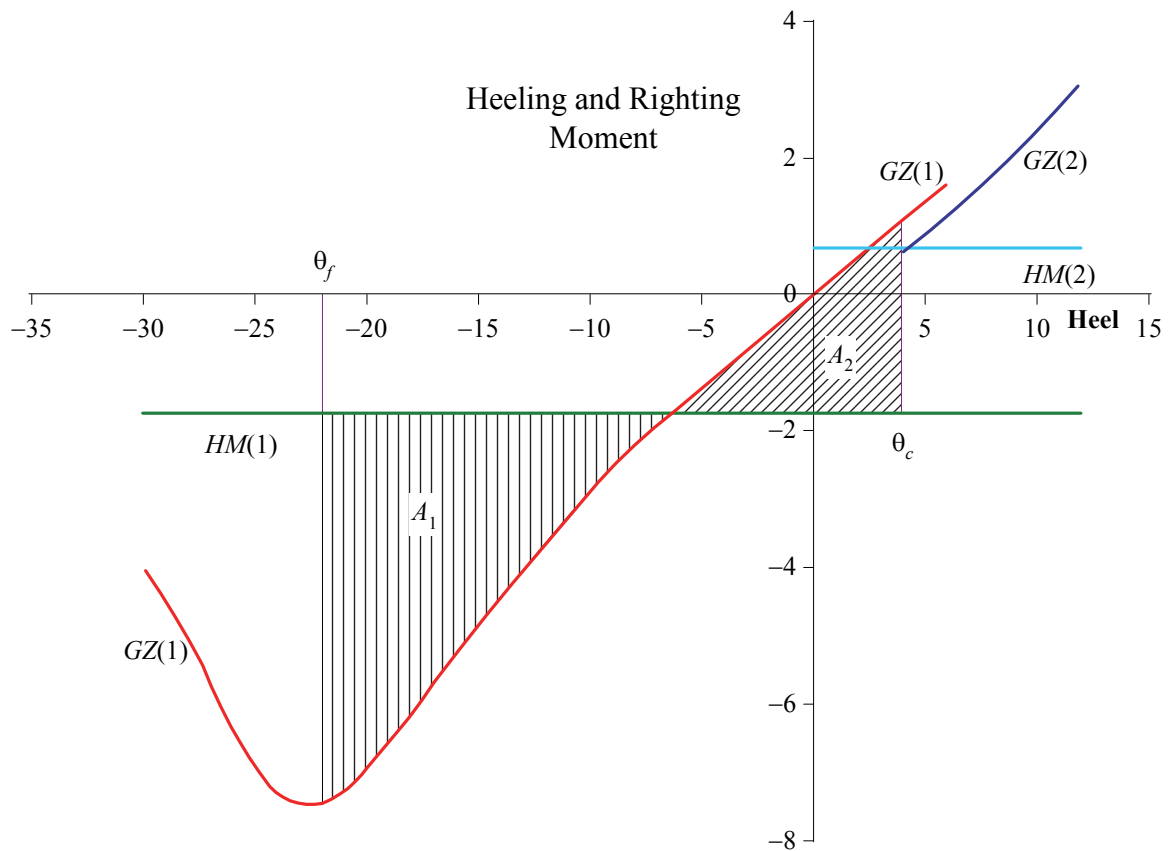
The following requirements are also to be met, with the unit at the maximum allowable vertical center of gravity in operation mode, to provide adequate stability in case of sudden loss of crane load:

- ii) The residual area between the first intercept and the angle of downflooding, the second intercept, or 30°, whichever occurs first, (area A_1 in 8-A1-1/Figure 1) is not to be less than 30% in excess of area A_2 in 8-A1-1/Figure 1.
- iii) The angle of the first intercept between the righting lever curve after loss of crane load and the maximum permissible counter ballast lever curve is not to exceed 15° (angle of equilibrium after loss of crane load).

3 Damage Stability

The unit must also meet the damage stability criteria in the *MOU Rules* for Column-Stabilized Units. The crane overturning moment is to be used concurrent with the wind overturning moment for the limiting environmental criteria established in the operations manual.

FIGURE 1
Criteria for CSU after Accidental Loss of Crane Load:
 $A_1 \geq 1.3 \cdot A_2$



- $GZ(1)$ = The righting moment curve at the displacement corresponding to the vessel without hook load.
- $GZ(2)$ = The righting moment curve at the displacement corresponding to the unit with hook load.
- $HM(1)$ = The heeling moment curve due to the heeling moment of the counter-ballast at the displacement without hook load.
- $HM(2)$ = The heeling moment curve due to the combined heeling moments of the hook load and the counter-ballast at the displacement with hook load.
- θ_f = Limit of area integration to the downflooding angle or second intercept (or 30°) on the counter-ballasted side of the unit.
- θ_c = Limit of area integration to the angle of static equilibrium due to the combined hook load and counter-ballast heeling moment.