

GUIDE FOR BUILDING AND CLASSING

MOBILE OFFSHORE UNITS

JULY 2008

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GUIDE FOR BUILDING AND CLASSING

MOBILE OFFSHORE UNITS

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Foreword (1 May 2010)

This Guide specifies the ABS requirements for building and classing Mobile Offshore Units of self-elevating or column-stabilized type, not fitted with drilling equipment, production facilities, hydrocarbon storage, or any other system onboard handling hydrocarbons. Examples of Mobile Offshore Units covered by this Guide are:

- Accommodation Units
- Crane Units
- Construction and Maintenance Units
- Drilling Tenders
- Pipe and Cable Laying Units
- Wind Turbine Installation, Maintenance and Repair Units

and similar units used by the offshore industry.

The requirements contained in this Guide are for design, construction, and survey after construction of the Mobile Offshore Unit (including hull structure, equipment and marine machinery) and are based on the *ABS Rules for Building and Classing Mobile Offshore Drilling Units (MODU Rules)*. Reference tables are provided to identify the requirements in the *MODU Rules* applicable to the Mobile Offshore Units.



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CHAPTER 1 Scope and Conditions of Classification (Supplement to the ABS Rules for Conditions of Classification – Offshore Units and Structures)

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CHAPTER 1 Scope and Conditions of Classification

SECTION 1 Classification

The requirements for conditions of classification are contained in the separate, generic *ABS Rules for Conditions of Classification – Offshore Units and Structures (Part 1)*.

Additional requirements specific to mobile offshore units are contained in the following Sections of this Guide.



CHAPTER 1 Scope and Conditions of Classification

SECTION 2 Classification Symbols and Notations

A listing of Classification Symbols and Notations available to the Owners of vessels, offshore drilling and production units and other marine structures and systems, "List of ABS Notations and Symbols" is available from the ABS website "<http://www.eagle.org>".

The following notations are specific to mobile offshore units.

1 Units Built Under Survey

Mobile Offshore Units which have been built to the satisfaction of the ABS Surveyor, to the full requirements of the applicable Rules and this Guide or their equivalent, where approved by the Committee, will be classed and distinguished in the *Record* by the symbols **✕ A1** followed by the notation to the type of unit as follows.

1.1 Self-Elevating Units

Units of this type, as described in 2-1/5.1, will be assigned a notation of **Self-Elevating Unit**.

1.3 Column-Stabilized Units

Units of this type, as described in 2-1/5.3, will be assigned a notation of **Column-Stabilized Unit**.

1.5 Specific Unit Types (1 May 2010)

Notations for specific types of units are given in the relevant Sections of Chapter 8.

3 Service Limitations

This Guide is intended for units designed for unrestricted service. Units which are not designed to meet the full criteria for unrestricted service will be classed with a notation **Restricted Service**. See also Chapter 1, Section 5 of this Guide.

5 Units Not Built Under Survey

Units which have not been built under ABS survey, but which are submitted for classification will be subject to a special classification survey. Where found satisfactory and thereafter approved by the Committee, they will be classed and distinguished in the *Record* by the symbols and notations as described in 1-2/1 and 1-2/11, but the mark **✕** signifying survey during construction will be omitted.

7 Temporary Mooring Equipment and Systems (1 August 2012)

Temporary mooring is intended for release at anchor or in an emergency while the unit is in the transit mode.

The symbol **Ⓔ** will be placed after the symbols of classification to signify that the equipment for **anchoring (temporary mooring)** of the unit is in compliance with 3-4-1/3 of the *ABS Rules for Building and Classing Mobile Offshore Drilling Units (MODU Rules)*.

For self-propelled units, symbol **Ⓔ** is mandatory and all anchoring (temporary mooring) equipment is to be fabricated and tested in presence of and to the satisfaction of the attending Surveyor, and certified in accordance with 6-1-10/Table 1 of the *MODU Rules*.

For non-propelled units fitted with an anchoring (temporary mooring) equipment, if the optional symbol **Ⓔ** is requested, equipment is to be fabricated and tested in presence of and to the satisfaction of the attending Surveyor, and certified in accordance with 6-1-10/Table 1 of the *MODU Rules*.

9 Position Mooring Equipment and Systems (1 August 2012)

Position mooring is intended for maintaining position during the operation of the unit.

9.1 Symbol **Ⓜ** for Position Mooring Equipment

The symbol **Ⓜ** will be placed after the symbols of classification, provided the position mooring equipment, certified by ABS in accordance with the optional class service requested by the Owner, at least complies with 3-4-1/5 of the *MODU Rules* and with requirements of the Owner's specification.

9.3 Symbol **Ⓟ** for Position Mooring System

The symbol **Ⓟ** will be placed after the symbols of classification to signify that the position mooring systems, certified by ABS in accordance with the optional class service requested by the Owner, are in compliance with Appendix 3-4-A1 of the *MODU Rules* and 3-4-1/7 of the *MODU Rules* and with requirements of the Owner's specification.

11 Propulsion Machinery

Propulsion machinery and boilers which are required for propulsion and which have been constructed and installed to the satisfaction of the Surveyor, to the full requirements of these Rules or their equivalent, when found satisfactory after a trial and approved by the Committee, will be classed and distinguished in the *Record* by the notation **⚙ AMS**.

13 Thrusters

Thruster machinery for propulsion assist or athwartship thrust complying with Section 4-3-5 of the *ABS Rules for Building and Classing Steel Vessels (Steel Vessel Rules)*, manufactured and installed under ABS survey and found satisfactory after trials, will be distinguished in the *Record* by the notation **⚙ PAS** or **⚙ APS**, as appropriate.

15 Dynamic Positioning Systems

Dynamic positioning systems complying with the requirements of the *ABS Guide for Dynamic Positioning Systems*, manufactured and installed under ABS survey and found satisfactory after trials, will be distinguished in the *Record* by the notation **⚙ DPS-0**, **⚙ DPS-1**, **⚙ DPS-2** or **⚙ DPS-3**, as appropriate.

17 Ice Strengthening

A notation **Ice Strengthening** will be added in the *Record* for units that comply with Appendix 3-2-A1 of the *MODU Rules*.

19 Automatic or Remote Control and Monitoring Systems

19.1 **⚙ ACC** or **⚙ ACCU** Notations

For automatic or remote control and monitoring systems of the propulsion machinery, ABS will consider additional classifications with symbols **⚙ ACC** or **⚙ ACCU**, as appropriate, provided that the applicable requirements of Part 4, Chapter 9 of the *Steel Vessel Rules* are satisfied.

19.3 ☒ AMCC or ☒ AMCCU Notations

For automatic or remote control and monitoring systems of the machinery other than the propulsion machinery as referenced in Subsection 1/1 of the *ABS Guide for Automatic or Remote Control and Monitoring for Machinery and Systems (other than Propulsion) on Offshore Installations*, ABS will consider additional classifications with symbols ☒ **AMCC** or ☒ **AMCCU**, as appropriate, provided that the applicable requirements of the *ABS Guide for Automatic or Remote Control and Monitoring for Machinery and Systems (other than Propulsion) on Offshore Installations* are satisfied.



CHAPTER 1 Scope and Conditions of Classification

SECTION 3 Rules for Classification

1 Application of Rules

1.1 General

This Guide is applicable to Mobile Offshore Units intended for unrestricted ocean service, except where specifically mentioned otherwise.

This Guide is intended for use in conjunction with the *ABS Rules for Building and Classing Mobile Offshore Drilling Units (MODU Rules)*, the *ABS Rules for Building and Classing Steel Vessels (Steel Vessel Rules)*, the *ABS Rules for Materials and Welding (Part 2)* and/or other applicable ABS Rules and Guides.

These requirements are applicable to those features that are permanent in nature and can be verified by plan review, calculation, physical survey or other appropriate means. Any statement in the applicable Rules and this Guide regarding other features is to be considered as guidance to the designer, builder, Owner, operator, or other client.

1.3 Application

This Guide has an effective date of 1 July 2008. The application of this Guide and referred Rules is, in general, based on the contract date for construction between the shipbuilder and the prospective Owner (e.g., Rules which became effective on 1 July 2008 are not applicable to a unit for which the contract for construction was signed on 30 June 2008). See also 1-1-4/3 of the *ABS Rules for Conditions of Classification – Offshore Units and Structures (Part 1)*.



CHAPTER 1 Scope and Conditions of Classification

SECTION 4 Plans and Design Data to be Submitted

1 Hull and Design Data

Plans showing the scantlings, arrangements and details of the principal parts of the structure of each unit to be built under survey are to be submitted for review and approved before the work of construction are commenced, as described in 3-1/1 and 5-1/1.7.

3 Machinery Plans

Plans are to be submitted showing the arrangements and details of all propulsion and auxiliary machinery, steering gear, boilers and pressure vessels, electrical systems, jacking or other self-elevating systems, bilge and ballast systems, fire extinguishing systems, and other pumps and piping systems as described in 4-1/1.7, 4-2/1.7, 4-3/1.5, 5-2/1.3 and 6-1/1.7.1.

5 Calculations

Design support calculations are to be submitted as described in 3-1/3.

7 Additional Plans (1 August 2012)

Where additional class notations or certification under the other Rules, Guides or regulations as described in Section 1-1-5 of the ABS Rules for Conditions of Classification – Offshore Units and Structures (Part 1) are requested, submission of additional plans and calculations may be required.

9 Submissions (2011)

Plans from designers and builders should generally be submitted electronically to ABS. However, hard copies will also be accepted.

All plan submissions originating from manufacturers are understood to have been made with the cognizance of the builder.



CHAPTER 1 Scope and Conditions of Classification

SECTION 5 Operating Manual

1

(1 October 2015) An operating manual which is consistent with the information and criteria upon which classification is based is to be placed aboard the unit for the guidance of the operating personnel. The primary language of the Operating Manual is to be English. Units not meeting the criteria of 3-1-3/1.3 and 4-1-1/7.7 of the MODU Rules for unrestricted service are to have the notation **Restricted Service – Elevated Condition or Restricted Service – Afloat Condition** and details of the service restrictions are to be placed in the Operating Manual. Insofar as classification is concerned, the operating manual is to include, as appropriate, the following information:

1.1

A general description of the unit, including major dimensions, lightship characteristics;

1.3

Summaries of approved modes of operation (See 2-1/7), including for each mode of operation:

- i) (1 August 2012) Limiting environmental conditions, including wave height and period, wind velocity, current velocity, service temperature of the unit (see 3-1-1/25 of the MODU Rules), minimum expected sea temperature, sea bed penetration, spud can-soil stiffness, air gap, and water depth;
- ii) Design deck loadings, mooring loads, icing loads, variable load, total elevated load, cantilever load, cranes and elevating systems and types of helicopter for which the helideck is designed;
- iii) Draft or draft range, leg length, spud can position and whether buoyant or non-buoyant, disposition of movable equipment (See 3-3/3) such as cantilevers, crane booms, etc.
- iv) Maximum allowable KG versus draft curves or equivalent and associated limitations or assumptions upon which the allowable KG is based;
- v) Disposition (open or closed) of watertight and weathertight closures (See 3-3/9);
- vi) (1 October 2015) Identification of “Restricted Service” conditions.

1.5

Information showing:

- i) General arrangements;
- ii) Preload capacity (See 3-1-3/1.11 and 3-2-3/5.7 of the MODU Rules);
- iii) Watertight and weathertight boundaries, location of unprotected openings, and watertight and weathertight closures;
- iv) Type, location and quantities of permanent ballast;
- v) Allowable deck loadings (See 3-1-3/1.11 of the MODU Rules);
- vi) Capacity, centers of gravity and free surface correction for each tank;
- vii) Capacity and centers of gravity of each void provided with sounding arrangements but not provided with means of draining [See 3-1-3/1.3.3(a) of the MODU Rules];
- viii) Location and means of draining voids, as specified in 4-2-4/3.3 of the MODU Rules;

- ix) Hydrostatic curves or equivalent;
- x) Hazardous areas (See Section 4-3/11);
- xi) Simplified electrical one line diagrams of main power and emergency power systems;
- xii) Schematic diagrams of the bilge, ballast and ballast control system;

1.7

Ballasting procedure as specified in 4-2-4/13.1 of the *MODU Rules*;

1.9

Procedure for elevating and preloading;

1.11

Loading and KG work sheets, sample calculations for each mode of operation and instructions for their use.

1.13

The Operating Manual is to be submitted for review by the American Bureau of Shipping solely to **verify** the presence of the above information which is to be consistent with the design information and limitations considered in the unit's classification. The American Bureau of Shipping is not responsible for the operation of the unit.

The Operating Manual required by this section does not need to be in addition to that required by flag and coastal Administrations. These administrations may require that additional information be included in the Operating Manual.



CHAPTER 2 General

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CHAPTER 2 General

SECTION 1 Definitions

1 General

For the purpose of this Guide, the terms in Section 3-1-1 of the *ABS Rules for Building and Classing Mobile Offshore Drilling Units (MODU Rules)* have the same meaning unless stated otherwise in this Section or other part of this Guide.

3 Mobile Offshore Unit or Unit

A vessel or a structure not fixed to the sea bed, capable of engaging in offshore operations other than drilling, production, storage, or handling of hydrocarbons, whether designed for operation afloat or supported on the sea bed.

5 Types of Unit

5.1 Self-Elevating Unit (1 August 2012)

A unit with movable legs capable of raising its hull above the surface of the sea and lowering it back into the sea.

The hull has sufficient buoyancy to transport the unit to the desired location. Once on location, the hull is raised to a predetermined elevation above the sea surface on its legs, which are supported by the sea bed.

The legs of such units may be designed to penetrate the sea bed, may be fitted with enlarged sections or footings, or may be attached to a bottom mat.

5.3 Column-Stabilized Unit

A unit with the main deck connected to the underwater hull or footings by columns or caissons.

The unit depends upon the buoyancy of columns for flotation and stability for all afloat modes of operation, or in the raising or lowering of the unit. Lower hulls or footings may be provided at the bottom of the columns.

5.3.1 Semi-Submersible Unit

A column-stabilized unit designed for offshore operations, either afloat or supported by sea bed.

5.3.2 Submersible Unit

A column-stabilized unit designed for offshore operations solely when supported by sea bed.

7 Mode of Operation

A *Mode of Operation* is a condition or manner in which a unit may operate or function while on location or in transit and includes the following.

7.1 Normal Operating Condition

A *Normal Operating Condition* is a condition wherein a unit is on location to perform its function, and combined environmental and operational loading are within the appropriate design limits established for such operations. The unit may be either afloat or supported by the sea bed.

7.3 Severe Storm Condition

A *Severe Storm Condition* is a condition wherein a unit may be subjected to the most severe environmental loadings for which it was designed. During the severe storm condition, it may be necessary to discontinue operations due to the severity of the environmental loadings. The unit may be either afloat or supported by the sea bed.

7.5 Transit Conditions

Transit Conditions are all unit movements from one geographical location to another.



CHAPTER 2 General

SECTION 2 Environmental Loadings

1 Loading Criteria (1 August 2012)

A unit's modes of operation should be investigated using anticipated loads, including gravity and functional loads together with relevant environmental loads due to the effects of wind, waves, currents, and where deemed necessary by the Owner or designer, the effects of earthquake, sea bed supporting capabilities, ambient temperature, fouling, ice, etc. Where applicable, the loads indicated herein are to be adhered to for all types of mobile offshore units. The Owner is to specify the environmental conditions for which the plans for the unit are to be approved. These design environmental conditions are to be recorded in the Operating Manual [see 1-1-5/1.3i) of the MODU Rules Supplement to the ABS Rules for Conditions of Classification – Offshore Units and Structures (Part 1)].

The environmental loading criteria for mobile offshore units are defined in Section 3-1-3 of the MODU Rules, as shown in 2-2/Table 1.

TABLE 1
Environmental Loading Criteria

	Section of MODU Rules
Wind Loadings	3-1-3/1.3
Wave Loadings	3-1-3/1.5
Current Loading	3-1-3/1.7
Loading due to Vortex Shedding	3-1-3/1.9
Gravity and Functional Loads	3-1-3/1.11

Note: Any reference to “drilling” in the MODU Rules is to be interpreted as referring to the type of operation for which the mobile offshore unit is designed and/or intended.

For analysis methods based on the Shallow Water Wave Theory and the Wave Theory for Deep Water, reference is made to Appendices 3-1-A1 and 3-1-A2 of the MODU Rules.

For selecting design waves for structural analysis of column-stabilized units (twin-hull semi-submersible), reference is made to Appendix 3-2-A2 of the MODU Rules.



CHAPTER 2 General

SECTION 3 Material Selection

1 Materials

This Section covers materials used for the construction of mobile offshore units. Structural materials are to be suitable for intended service conditions. They are to be of good commercial quality, defined by a recognized specification and free of injurious defects. Materials used in the construction of the hull and machinery of mobile offshore units are to be in accordance with the *ABS Rules for Materials and Welding (Part 2)*.

The requirements for material selection are determined by [Section 3-1-4](#) of the *MODU Rules*, as shown in 2-3/Table 1.

TABLE 1
Material Selection (1 August 2012)

	<i>Section of MODU Rules</i>
Material Characteristics	3-1-4/1.3
Toughness	3-1-4/1.5
Materials Other than Steel	3-1-4/1.7
Service Temperature	3-1-4/1.9
Hull Steel Grades	3-1-4/3
Selection of Grades	3-1-4/5

Note: Any reference to “drilling” in the *MODU Rules* is to be interpreted as referring to the type of operation for which the mobile offshore unit is designed and/or intended.

A guide for material selection for ABS Grades of high strength quenched and tempered steel is provided in Appendix 3-1-A3 of the *MODU Rules*.



CHAPTER 3 Hull Construction and Equipment

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CHAPTER 3 Hull Construction and Equipment

SECTION 1 Plans and Design Data to be Submitted

1 Hull and Design Data

Plans showing the scantlings, arrangements and details of the principal parts of the structure of each unit to be built under survey are to be submitted for review and approved before the work of construction are commenced. These plans are to clearly indicate the scantlings, joint details and welding, or other methods of connection. In general, plans are to include the following, where applicable. Additional plans may be required where the required attendance of the Surveyor is anticipated at more than one location.

- General arrangement
- Inboard and outboard profile
- An arrangement plan of watertight compartmentation
- Diagrams showing the extent to which the watertight and weathertight integrity is intended to be maintained, including the location, type and disposition of watertight and weathertight closures.
- Summary of distributions of fixed and variable weights for each reviewed condition.
- Type, location and quantities of permanent ballast
- Loadings for all decks
- Transverse sections showing scantlings
- Longitudinal sections showing scantlings
- Decks
- Helicopter deck with helicopter particulars (See 3-2-2/3.1 of the *ABS Rules for Building and Classing Mobile Offshore Drilling Units (MODU Rules)*)
- Framing
- Shell plating
- Watertight bulkheads and flats
- Structural bulkheads and flats
- Tank bulkheads and flats with level of top of overflows and air pipes
- Pillars and girders
- Diagonals and struts
- Legs
- Structure in way of jacking or other elevating arrangements
- Stability columns and intermediate columns
- Hulls, pontoons, footings, spudcans, pads or mats
- Superstructures and deck houses
- Arrangement and details of watertight doors and hatches

- Foundations for anchoring equipment, industrial equipment, etc., where attached to hull structure, superstructures or deckhouses
- Welding details and procedures
- Lines and offsets
- Curves of form or equivalent data
- Wind heeling moment curves or equivalent data
- Capacity plan
- Tank sounding tables
- Corrosion control arrangements
- Methods and locations for nondestructive testing
- Plans for conducting underwater inspections in lieu of drydocking
- (1 August 2012) A description of environmental conditions including the service temperature of the unit (see 3-1-1/25 of the MODU Rules) and minimum expected sea temperatures for each mode of operation
- (1 August 2012) Critical structural areas identified in structural analyses (see 3-1-1/29 of the MODU Rules)

3 Calculations

The following calculations are to be submitted.

- Structural analysis, including fatigue analysis
- Resultant forces and moments from wind, waves, current, mooring and other environmental loadings
- Effects of icing on structural loadings and stability
- Wind resistance area of exposed structural elements
- Stability calculations, both intact and damaged
- Calculations substantiating adequacy of structure to transmit forces between legs and hull through the jacking or other self-elevating system
- Evaluation of the unit's ability to resist overturning while bearing on the sea bed

Submitted calculations are to be suitably referenced.

Results from model tests or dynamic response calculations may be submitted as alternatives or substantiation for required calculations.



CHAPTER 3 Hull Construction and Equipment

SECTION 2 Hull Structures and Arrangements

1 Structural Analysis

1.1 Structural Analysis

The structure of mobile offshore units is to be analyzed in accordance with 3-2-1/1 of the *MODU Rules*, as shown in 3-2/Table 1.

TABLE 1
Structural Analysis

	<i>Section of MODU Rules</i>
Analysis of Primary Structure	3-2-1/1.1
Consideration of Local Stresses	3-2-1/1.3
Combination of Stress Components	3-2-1/1.5
Consideration of Buckling	3-2-1/1.7
Determination of Bending Stresses	3-2-1/1.9
Determination of Shear Stresses	3-2-1/1.11
Stress Concentration	3-2-1/1.13
Analysis and Details of Structural Connections	3-2-1/1.15
Fatigue Analysis	3-2-1/1.17
Plastic Analysis	3-2-1/1.19

1.3 Allowable Stresses

The scantlings of effective structural elements of the primary frame of the unit, analyzed in accordance with 3-2/1.1, are to be determined on the basis of the allowable stresses specified in 3-2-1/3 of the *MODU Rules*, as shown in 3-2/Table 2.

TABLE 2
Allowable Stresses

	<i>Section of MODU Rules</i>
Individual Stresses	3-2-1/3.3
Buckling Considerations	3-2-1/3.5
Members Subjected to Combined Axial Load and Bending	3-2-1/3.7
Column Buckling Stresses	3-2-1/3.9
Equivalent Stress Criteria for Plated Structures	3-2-1/3.11

3 Common Structures

3.1 Materials

This Guide, except where specified otherwise, is intended for mobile offshore units constructed of steel, manufactured and having the properties as specified in Chapter 3 of the *ABS Rules for Materials and Welding (Part 2)*. Where it is intended to use steel or other material having properties differing from those specified in Chapter 3 of the above referenced Part 2, the use of such material and the corresponding scantlings will be specially considered.

3.3 Scantlings

Scantlings of the major structural elements of the unit are to be determined in accordance with this Guide. Scantlings of structural elements which are subjected to local loads only, and which are not considered to be effective components of the primary structural frame of the unit, are to comply with the applicable requirements of the *ABS Rules for Building and Classing Steel Vessels (Steel Vessel Rules)* or the *ABS Rules for Building and Classing Steel Barges (Barge Rules)*.

3.5 Protection of Steel Work (1 August 2012)

Unless otherwise approved, all steel work is to be suitably coated. Tanks or preload spaces intended for seawater ballast are to have a corrosion-resistant hard coating on all internal surfaces. Other effective methods of corrosion protection will be specially considered.

In cases where scantlings are based on 3-2/1.1 and 3-2/1.3, and corrosion control methods are not provided, the scantlings are to be suitably increased.

3.5.1 Performance Standards for Protective Coating (PSPC)

Where requested by the Owner, a unit with protective coatings which are found to comply with the requirements in the *ABS Guide for the Class Notation Coating Performance Standard (CPS)* will be assigned and distinguished in the Record with the class notation **CPS**.

3.7 Structural Considerations

Independently of the type of mobile offshore unit, the structures of elements such as helicopter decks, watertight bulkheads and decks or tank boundaries are to comply with the requirements of Section 3-2-2 of the *MODU Rules*, as shown in 3-2/Table 3.

TABLE 3
Common Structures (2011)

	Section of MODU Rules
Helicopter Deck	3-2-2/3
Watertight Bulkheads and Watertight Flats	3-2-2/7, 3-2-2/13
Tank Bulkheads and Tank Flats	3-2-2/9, 3-2-2/13
Appurtenant Structure	3-2-2/11
Lifeboat Platform	3-2-2/11.3
Crane Pedestal and Foundation	3-2-2/11.5

Note: Any reference to “drilling” in the *MODU Rules* is to be interpreted as referring to the type of operation for which the mobile offshore unit is designed and/or intended.

5 Self-Elevating Units

5.1 Application

This Subsection applies to self-elevating units, as defined in 2-1/5.1.

5.3 General Requirements for **Materials and Scantlings** (1 August 2012)

5.3.1 Material Selection

Grouping of structural elements of self-elevating units into material application categories (special, primary, secondary) is to be in accordance with 3-2-3/3.1 of the *MODU Rules*.

5.3.2 Scantlings

Scantlings of the major structural elements of the unit are to be determined in accordance with the requirements of Sections 3-2/1 and 3-2/3. Where applicable, and except as outlined below, scantlings are also to meet the requirements of the *Steel Vessel Rules* or the *Barge Rules*. The section modulus requirement for framing members, in general, may be determined from the equations in 3-2-4/3 of the *MODU Rules*, where the values of c , h , s and ℓ are as indicated in 3-2/Figure 1.

5.5 Structural Considerations

Structures specific to self-elevating units and related structural considerations are to be in accordance with Section 3-2-3 of the *MODU Rules*, as shown in 3-2/Table 4.

TABLE 4
Self-Elevating Units

	<i>Section of MODU Rules</i>
Units Elevated Modes	3-2-3/5
Legs	3-2-3/7
Hull Interface Structure with Legs	3-2-3/9
Hull Structure	3-2-3/11
Spudcan and Bottom Mat	3-2-3/13
Deckhouses	3-2-3/15

Note: Any reference to “drilling” in the *MODU Rules* is to be interpreted as referring to the type of operation for which the mobile offshore unit is designed and/or intended.

7 Column-Stabilized Units

7.1 Application

This Subsection applies to column-stabilized units, as defined in 2-1/5.3.

7.3 Special Considerations Regarding Stresses

On column-stabilized units, the highest stresses in some members may be associated with environmental conditions less severe than the maximums specified by the Owner. Where considered necessary, such stresses and the increased probability of their occurrence are to be taken into account by either or both of the following.

- i) Suitable reduction of the allowable stress levels given in 3-2/1.3 for combined loadings, as defined in 3-2-1/1.1ii) of the *MODU Rules*.
- ii) Detailed investigation of the fatigue properties in order to evaluate the possibility of high stresses in association with probability of occurrence.

Particular attention is also to be given to the structural details in critical areas such as bracing members, joint connections, etc.

7.5 Effect of Mooring Forces on Local Structure

Local structure in way of fairleads, winches, etc., forming part of the position mooring system, is to be capable of withstanding forces equivalent to the breaking strength of the mooring line with the allowable stresses of combined loading conditions defined in 3-2/1.3.

7.7 Material Selection (1 August 2012)

Grouping of structural elements of column-stabilized units into material application categories (special, primary, secondary) is to be in accordance with 3-2-4/1.7 of the *MODU Rules*.

7.9 Structural Considerations

Structures specific to column-stabilized units and related structural considerations are to be in accordance with Section 3-2-4 of the *MODU Rules*, as shown in 3-2/Table 5.

TABLE 5
Column-Stabilized Units (2011)

	Section of <i>MODU Rules</i>
Upper Structure	3-2-4/3, 3-2-4/15
Columns, Lower Hulls and Footings	3-2-4/5
Deckhouses	3-2-4/7
Wave Clearance	3-2-4/9
Structural Redundancy	3-2-4/11

Note: Any reference to “drilling” in the *MODU Rules* is to be interpreted as referring to the type of operation for which the mobile offshore unit is designed and/or intended.

9 Welding, Forming and Weld Design (1 August 2012)

9.1 Weld Design

Weld design is to be in compliance with Section 3-2-6 of the *MODU Rules*, as shown in 3-2/Table 6.

TABLE 6
Weld Design (1 August 2012)

	Section of <i>MODU Rules</i>
Fillet Welds	3-2-6/1
Full or Partial Penetration Corner or Tee Joints	3-2-6/3
Alternatives	3-2-6/5

11 Navigation in Ice

11.1 Column-Stabilized Units

Subsections 3-2-A1/3 through 3-2-A1/15 of the *MODU Rules* are intended for column-stabilized units navigating in ice. Column-stabilized units constructed in accordance with 3-2-A1 of the *MODU Rules* will be distinguished in the *Record* by **Ice Class** followed by ice class **A1**, **A0**, **B0**, **C0** or **D0** to indicate the degree of strengthening adopted.

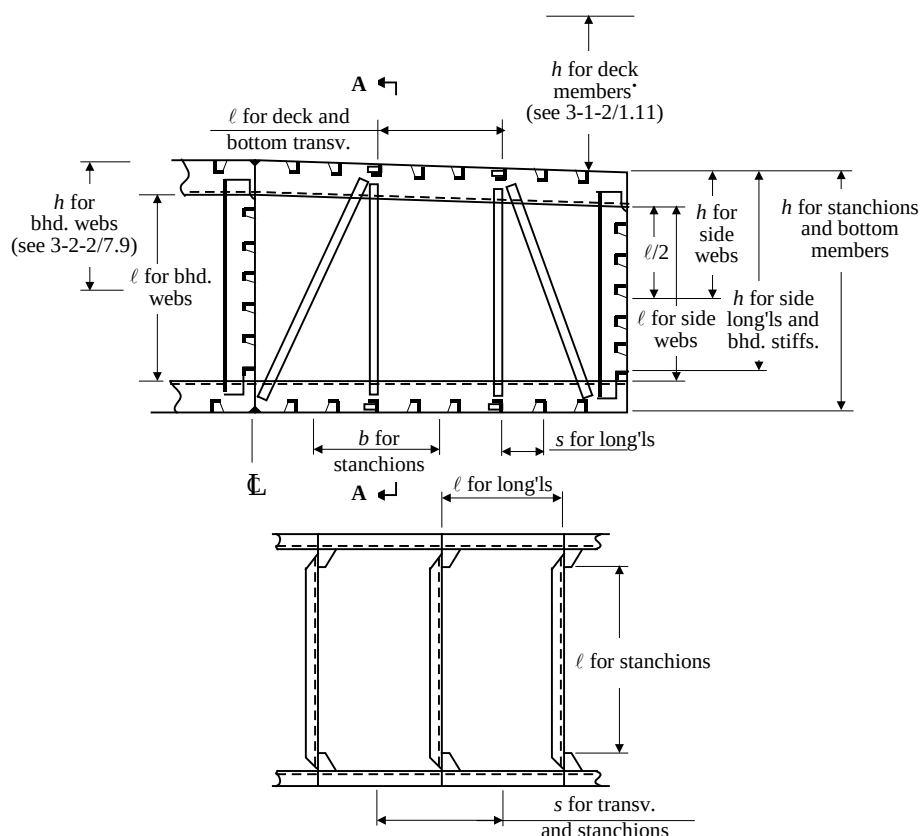
11.3 Self-Elevating Units

Ice strengthening for self-elevating units is to be in accordance with Section 6-1-5 of the *Steel Vessel Rules* including 6-1-5/31 for non-self-propelled units.

11.5 Novel Features

Ice strengthening notations and requirements for units of novel type or design will be specially considered.

FIGURE 1
Typical Hull Construction



Section A-A

*Not to be less than $L/50 + 0.762$ meters ($L/50 + 2.5$ feet), maximum 2.9 m (9.5 ft) where L is the length of the unit in m (ft).

Note: Typical transverse section (longitudinal framing) shown. References are to *MODU Rules*

Bottom transverses (or girders)	$c = 1.50$	Bottom long's (or frames)	$c = 1.34$
Side webs (or girders)	$c = 1.50$	Side long's (or frames)	$c = 1.00$
Deck transverses (or girders)	$c = 1.00$	Deck long's (or beams)	$c = 0.60$
Bulkhead webs (or girders)	$c = 1.00$	Bulkhead stiffeners	$c = 0.70$

$$\text{Stanchions } W = f b h s \text{ kN (tf, Ltf)}$$

$$f = 10.5 (1.07, 0.03)$$

$$b, h \text{ and } s \text{ in meters (feet)}$$

In way of tanks, scantlings are also to meet the requirements of 3-2-2/9 of the *MODU Rules*.



CHAPTER 3 Hull Construction and Equipment

SECTION 3 Stability and Watertight/Weathertight Integrity

1 Stability (1 August 2012)

All units are to have positive metacentric height in calm water equilibrium position for all afloat conditions, including temporary positions when raising or lowering. For the purpose of determining compliance with the stability requirements contained herein, it is to be assumed that the unit is floating free of mooring restraints. However, detrimental effects of catenary mooring systems or of the thrusters for dynamically positioned units are to be considered.

The metacentric height is to be specified for each mode of operation and guidance is to be included in the Operating Manual on the procedure to determine and satisfy the expected metacentric height. This may be accomplished by including the minimum metacentric height in the calculation of the allowable KG.

The wind speeds referenced in this section are to be used to calculate overturning moments for intact and damage stability calculations. These wind speeds are not intended to represent actual environmental limits.

Stability requirements in accordance with 3-3-2/1 and 3-3-1/3 of the *MODU Rules* are to be complied with, as shown in 3-3/Table 1.

TABLE 1
Stability (1 August 2012)

	<i>Section of MODU Rules</i>
Stability Afloat	3-3-2/1.3
Intact Stability	3-3-2/1.3.1
Damage Stability	3-3-2/1.3.2, 1.3.3
Alternatives for Treatment of Void Spaces	3-3-2/1.3.4
Inclining Experiment	3-3-1/3

Note: Any reference to “drilling” in the *MODU Rules* is to be interpreted as referring to the type of operation for which the mobile offshore unit is designed and/or intended.

3 Stability Criteria

Righting moment curves and overturning moment curves with supporting calculations are to be prepared for the full range of anticipated operating drafts. The calculations are to be performed in a manner to reflect a sustained wind force from any horizontal direction in order to determine the critical stability axis. For purposes of these calculations, the configuration of the unit is to reflect the actual condition of the unit during afloat operation, such as the operation of cranes and the position of legs for self-elevating units.

The stability criteria in accordance with 3-3-2/3 of the *MODU Rules* are to be applied to mobile offshore units, as shown in 3-3/Table 2.

TABLE 2
Stability Criteria (1 August 2012)

	<i>Section of MODU Rules</i>
Righting Moment	3-3-2/3.3
Overturning Moment	3-3-2/3.7
Wind Tunnel Tests	3-3-2/3.9
Alternative Stability Criteria	3-3-2/3.11

Note: Any reference to “drilling” in the *MODU Rules* is to be interpreted as referring to the type of operation for which the mobile offshore unit is designed and/or intended.

5 Load Line

Every mobile unit is to have marks which designate the maximum permissible draft when the unit is in the afloat condition. Such markings are to be placed at suitable visible locations on the structure, to the satisfaction of ABS. On column-stabilized units, where practical, these marks are to be visible to the person in charge of mooring, lowering or otherwise operating the unit.

The load lines are to be established under the terms of the International Convention on Load Lines. Where minimum free-boards cannot be computed by the normal methods laid down by the Convention, they are to be determined on the basis of compliance with the intact or damage stability requirements for afloat modes of operation. The requirement that the draft of the unit not exceed the assigned load line may be considered temporarily not applicable for bottom-supported units when raising, lowering or resting on the sea bed.

The requirements of the International Convention on Load Lines with respect to weathertightness and watertightness of decks, superstructures, deckhouses, doors, hatchway covers, other openings, ventilators, air pipes, scuppers, inlets and discharges, etc., are to be taken as a basis for all units in the afloat condition. (For column-stabilized units, see also 3-3-2/5.1 of the *MODU Rules*)

7 Extent of Damage for Damage Stability Studies

In assessing the damage stability of mobile offshore units, as required by 3-3-2/1.3.2 and 3-3-2/1.3.3 of the *MODU Rules*, the following extent of damage is to be assumed.

If damage of a lesser extent results in a more severe condition, such lesser extent is to be assumed.

All piping, ventilating systems, trunks, etc., within the assumed damage area are to be considered damaged. Positive means of closure are to be provided to preclude progressive flooding of other intact spaces. See 3-2-2/7 of the *MODU Rules* for specific requirements for watertight bulkheads and flats.

The extent of damage for mobile offshore units is defined in 3-3-2/3.5 of the *MODU Rules*, as shown in 3-3/Table 3.

TABLE 3
Extent of Damage

	<i>Section of MODU Rules</i>
Self-Elevating Units	3-3-2/3.5.1
Column-Stabilized Units	3-3-2/3.5.2

Note: Any reference to “drilling” in the *MODU Rules* is to be interpreted as referring to the type of operation for which the mobile offshore unit is designed and/or intended.