



## **RULES FOR BUILDING AND CLASSING**

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# **MOBILE OFFSHORE DRILLING UNITS 2008**

### **PART 6 SURVEYS**

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

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## Rule Change Notice (2008)

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 2006 Rules

The reference date which is indicated in the parentheses following the title of the requirement in this Part is the date that the requirement becomes effective [e.g., 6-2-1/1 “Definitions” (2008) is to apply for vessels undergoing survey on or after 1 January 2008]

#### EFFECTIVE DATE 1 January 2008 – shown as (2008)

<i>Part/Para. No.</i>	<i>Title/Subject</i>	<i>Status/Remarks</i>
6-2-1/1 (New)	Definitions	To incorporate appropriate definitions for terms used in the survey requirements.
6-2-2/1	Special Surveys, Drydocking Surveys, and Underwater Inspections in Lieu of Drydocking	To address survey pre-planning requirements based on MODU classification experience.
6-2-2/3 (Deleted)	Underwater Inspection in Lieu of Drydocking	To address survey pre-planning requirements based on MODU classification experience.
6-2-4/3.1 (Title Only)	General	To address Special Survey requirements based on MODU classification experience and input from the “Aging Rig” Ad Hoc committee.
6-2-4/3.3 (New)	Thickness Gauging Requirements	To address Special Survey requirements based on MODU classification experience and input from the “Aging Rig” Ad Hoc committee.
6-2-4/3.5 (New)	Nondestructive Testing	To address Special Survey requirements based on MODU classification experience and input from the “Aging Rig” Ad Hoc committee.
Appendix 6-2-A1 (New)	Guide for Lay-up and Reactivation of Laid-up Mobile Offshore Drilling Units	To update the requirement for reactivation of laid-up mobile offshore drilling units.

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## Surveys

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## CHAPTER 1 Testing and Trials

### SECTION 1 General

#### 1 Watertight Bulkhead Testing

##### 1.1 General

After all hatches and watertight doors are installed, penetrations including pipe connections are fitted, and before cement work, ceiling or special coatings are applied, all watertight bulkheads and flats, as indicated on the watertight compartmentation plan [see 1-1-7/1 of the *ABS Rules for Classification of Offshore Units and Structures (Part 1)*], are to be tested and proven tight. Shop primer may be applied prior to testing.

##### 1.3 Hose Testing

Hose tests are to be carried out under simultaneous inspection of both sides of the joint. The pressure in the hose is not to be less than 2.1 bar (2.1 kgf/cm<sup>2</sup>, 30 psi).

##### 1.5 Air Testing

Prior to the application of special coating, air testing by an approved procedure may be accepted as an alternative or supplement to hose testing. All boundary welds, erection joints and penetrations, including pipe connections, are to be examined under the approved air pressure difference by a suitable leak detection solution.

#### 3 Tank Bulkhead Testing

##### 3.1 General

After all penetrations, including pipe connections, are fitted, and before cement work, ceiling, etc., are applied, all tanks are to be tested and proven tight. Shop primer may be applied before testing.

##### 3.3 Hydrostatic Testing

Unless air testing has been accepted as an alternative, tanks are to be tested with a head of water to the overflow or to the highest point to which the contents may rise under service conditions, whichever is higher. This may be carried out either before or after the vessel is launched. Special coating may be applied before hydrostatic testing, provided all welded connections are visually examined to the satisfaction of the Surveyor before application of the special coating.

### **3.5 Air Testing**

Prior to the application of special coating, air testing by an approved procedure may be accepted as a supplement or alternative to hydrostatic testing. All boundary welds, erection joints and penetrations, including pipe connections, are to be examined under the approved air pressure difference by a suitable leak detection solution.

### **3.7 Structural Testing**

In order to demonstrate structural adequacy, representative hydrostatic testing of tanks of new or unusual design may be required in connection with the approval of the design.

## **5 Jacking Gear**

### **5.1 Prototype Test**

A prototype test is to be performed on one unit of a newly designed rack and pinion system as part of the design approval procedure.

The prototype test procedure is to be submitted for review and as a minimum is to include the following.

### **5.3 Prior to the Test**

Prior to the test, all pinions and gears of the climbing pinion gear train are to be examined using an approved crack detection procedure. (ABS material certificates as per 4-1-4/9 are to be provided for the prototype unit.)

### **5.5 Test**

The prototype test is to be carried out at 150% of the maximum normal holding capacity rating of the unit. As a minimum, the test is to be carried out for one complete revolution of the climbing pinion.

### **5.7 Subsequent to the Test**

Subsequent to the test, the unit is to be disassembled and examined. All pinions and gears of the climbing pinion gear train are to be examined using an approved crack detection procedure. The above testing and examination are to be carried out in the presence of, and to the satisfaction of, the Surveyor.

## **7 Initial Jacking Test**

The test should include a trial jacking of the completed hull up to the limit of designed travel and then down again, to prove alignment of leg racks, pinions and guides, effectiveness of lock or brake arrangements, and proper functioning of jacking system together with electrical safety system monitoring indicators.



## **9 Rotating Machines - Testing and Inspection**

### **9.1 Applications**

#### **9.1.1 Machines of 100 kVA/kW and Over**

With the exception of rotating machines intended solely for drilling operations (see 4-2-1/1), all rotating machines of 100 kVA/kW and over are to be tested in accordance with 4-6-4/Table 1 in the presence of and inspected by the Surveyor, preferably at the plant of the manufacturer.

#### **9.1.2 Machines Below 100 kVA/kW**

For machines of less than 100 kVA/kW, the tests may be carried out by the manufacturer whose certificate of tests will be acceptable and is to be submitted upon request from the Bureau.

### **9.3 Special Testing Arrangements**

In cases where all of the required tests are not carried out at the plant of the manufacturer, the Surveyor is to be notified and arrangements are to be made so that the remaining tests will be witnessed.

## **11 Moveable Cantilever and Skid Beam Testing**

Prior to placing the unit in service, a function test of the longitudinal skidding arrangements of the moveable cantilever and skid beam as well as any transverse skidding arrangements such as the subbase (drill floor) is to be carried out by skidding the completed drilling structures with derrick assembly to the maximum limits of travel.

## **13 Piping Systems Pressure Tests (2002)**

In addition to the testing and inspection of materials, as required in Chapter 3 of the *ABS Rules for Materials and Welding (Part 2)*, the following tests on the fabricated piping are to be witnessed by the Surveyor after bending and the attachment of flanges.

Small bore pipes and tubes of less than 15 mm outside diameter may be exempted from the required hydrostatic tests.

### **13.1 Fuel-oil Service System (2002)**

Pressure lines are to be tested before installation to 1.5 times the design pressure of the system, but not less than 3.4 bar (3.5 kgf/cm<sup>2</sup>, 50 psi).

### **13.3 Fuel-oil Suction and Transfer Lines**

Transfer systems and fuel-oil suction lines are to be tested before installation to 3.4 bar (3.5 kgf/cm<sup>2</sup>, 50 psi).

### **13.5 Starting-air Piping**

Piping in starting-air systems is to be tested, preferably before installation, to 1.5 times the design pressure of the system.

### **13.7 Hydraulic Power Piping**

After fabrication, the hydraulic power piping system or each piping component is to be tested to 1.5 times the design pressure.

### 13.9 All Piping (2002)

After installation, all piping is to be tested under working conditions.

Where it is not possible to carry out the required hydrostatic tests for all segments of pipes and integral fittings before installation, the remaining segments, including the closing seams, may be so tested after installation. Or, where it is intended to carry out all of the required hydrostatic tests after installation, such tests may be conducted in conjunction with those required by this Paragraph. In both these respects, testing procedures are to be submitted to the Surveyor for acceptance.

### 13.11 Specific Systems (2002)

The following piping systems are to be hydrostatically tested in the presence of the Surveyor to  $1.5P$ , but not less than 4 bar (4.1 kgf/cm<sup>2</sup>, 58 psi), after installation:

- Gas and liquid fuel systems
- Heating coils in tanks

### 13.13 Hydrostatic Tests of Shell Valves (2002)

All valves intended for installation on the side shell at or below the load waterline, including those at the sea chests, are to be hydrostatically tested in the presence of the Surveyor before installation to a pressure of at least 5 bar (5.1 kgf/cm<sup>2</sup>, 72.5 psi).

### 13.15 Pneumatic Tests in Lieu of Hydrostatic Tests (2002)

In general, a pneumatic test in lieu of a hydrostatic test is not permitted. Where it is impracticable to carry out the required hydrostatic test, a pneumatic test may be considered. In such cases, the procedure for carrying out the pneumatic test, having regard to safety of personnel, is to be submitted to the Surveyor for review.

## 15 Pump Hydrostatic Test

All pumps are to be hydrostatically tested to  $1.5P$ , but not less than 3.9 bar (4 kgf/cm<sup>2</sup>, 57 psi), where  $P$  is the maximum working pressure in the part concerned. When it is desired to conduct the hydrostatic test on the suction side of the pump independently from the test on the discharge side, the test pressure is to be  $1.5P_s$ , but not less than 3.9 bar (4 kgf/cm<sup>2</sup>, 57 psi), where  $P_s$  is the maximum pressure available from the system at the suction inlet.

## 17 Pump Capacity Test

Pump capacities are to be checked with the pump operating at design conditions (rated speed and pressure head). For centrifugal pumps, the pump characteristic (head-capacity) design curve is to be verified to the satisfaction of the Surveyor.

## 18 Relief Valve Capacity Test (2005)

For positive displacement pumps with an integrated relief valve, the valve's setting and full flow capacity corresponding to the pump maximum rating is to be verified. The operational test for the relief valve capacity may be waived if previous satisfactory tests have been carried out on similar pumps.

## **19 Testing On Board After Installation**

Piping systems are to be subjected to a hydrostatic test pressure of not less than 1.5 times the design pressure to the satisfaction of the Surveyor.

For piping required to be electrically conductive, earthing is to be checked and random resistance testing is to be conducted to the satisfaction of the Surveyor.

## **21 Fixed Oxygen-Acetylene Installations Testing (2006)**

Piping on the oxygen high-pressure side is to be tested before installation to at least 207 bar (211 kgf/cm<sup>2</sup>, 300 psi) and the piping on the acetylene high-pressure side is to be tested in accordance with Section 4-2-2.

The entire system is to be leak-tested with nitrogen or a suitable inert gas after installation. Care is to be taken to cleanse the piping with suitable medium to remove oil, grease and dirt and to blow-through with oil-free nitrogen or other suitable medium before putting the system in service. The system is to be operationally tested in the presence of the Surveyor under working conditions after installation.

## **23 Switchboards, Distribution Boards, Chargers and Controllers – Testing and Inspection**

### **23.1 Applications**

#### **23.1.1 For Essential or Emergency Services**

All Switchboards and motor controllers intended for essential services or emergency services are to be tested in the presence of and inspected by the Surveyor, preferably at the plant of the manufacturer. For distribution boards, the tests may be carried out by the manufacturer whose certificate of tests will be acceptable and is to be submitted upon request from the Bureau.

#### **23.1.2 For Nonessential or Non-emergency Services**

For switchboards, distribution boards and motor controllers of other than essential or emergency services, the tests may be carried out by the manufacturer whose certificate of tests will be acceptable and is to be submitted upon request from the Bureau.

#### **23.1.3 Motor Control Centers**

All motor control centers whose total connected motor rating is 100 kW or more, regardless of their services, are to be tested in the presence of and examined by the Surveyor, preferably at the plant of the manufacturer.

#### **23.1.4 Battery Chargers and Discharging Board**

Where a battery charger and discharging board are used for emergency source of power or transitional source of power, they are to be tested in the presence of and examined by the Surveyor, preferably at the plant of the manufacturer. For all other battery chargers and discharging boards, the tests may be carried out by the manufacturer whose certificate of tests will be acceptable and is to be submitted upon request from the Bureau.

#### **23.1.5 Test Items**

Tests are to be carried out in accordance with the requirements in 4-6-4/Table 5.

## 23.2 Special Testing Arrangements

In cases where all of the required tests are not carried out at the plant of the manufacturer, the Surveyor is to be notified and arrangements are to be made so that the remaining tests may be witnessed.

## 25 Transformers – Testing (1999)

For single-phase transformers rated 1 kVA and above or three-phase transformers rate 5 kVA and above intended for essential or emergency services, the following tests are to be carried out by the transformer's manufacturer in accordance with a recognized standard whose certificate of test is to be submitted for review upon request.

- i) Measurement of winding resistance, voltage ratio, impedance voltage, short circuit impedance, insulation resistance, load loss, no load loss and excitation current, phase relation and polarity.
- ii) Dielectric strength.
- iii) Temperature rise (required for one transformer of each size and type). See 4-3-4/9.3.

## 27 Electrical Service Trials

### 27.1 Electrical Installation for Drilling Unit Main Services

All auxiliary apparatus is to be tried under working conditions. Each generator is to be run for a time sufficient to show satisfactory operation, and parallel operation with all possible combinations is to be demonstrated. Each auxiliary motor necessary to the operation of the drilling unit is to be run for a time sufficient to show satisfactory performance at such load as can readily be obtained. All main switches and circuit breakers are to be operated, but not necessarily at full load. The operation of the lighting system, heaters, etc., is to be demonstrated satisfactorily. The entire installation is to operate to the satisfaction of the Surveyor and the drop in voltage on any part of the installation is not to exceed 6%. See 4-3-3/5.1.3.

### 27.3 Communication Facilities

Satisfactory operation of the interior communications system required by 4-3-2/15 is to be demonstrated to the Surveyor during sea trials. Particular attention is to be given to demonstrating that the voice communication systems required by 4-3-2/15 provide the capability of carrying on a conversation while the drilling unit is being navigated.

## 29 Trials for Self-propelled Drilling Units

### 29.1 Full Power

A final under-way full-power trial is to be made of all machinery required for propulsion, the steering gear and the anchor windlass. For surface-type and self-elevating units, the trial is to be conducted at the draft corresponding to the minimum freeboard.

For column-stabilized units, the trial is to be conducted at transit draft or as near transit draft as practicable.

### 29.3 Reduced Power

Column-stabilized units are to conduct final under-way reduced-power trial of all machinery required for propulsion at a design operating draft to the satisfaction of the Surveyor.

## **29.5 Machinery Operation**

The operation of other machinery, electrical systems and safety features required by the Rules is to be demonstrated to the satisfaction of the Surveyor.

## **31 Trials for Non-self-propelled Drilling Units**

The operation of machinery, electrical systems and safety features required by these Rules is to be demonstrated to the satisfaction of the Surveyor.

Lighting system, heaters, etc., is to be demonstrated satisfactorily. The entire installation is to operate to the satisfaction of the Surveyor and the drop in voltage on any part of the installation is not to exceed 6%. See 4-3-3/5.1.3.

## **33 Dock and Sea Trials**

Complete tests are to be carried out, including duration runs and tests for operation of all protective devices and stability tests for control, and if the drilling unit is self-propelled, maneuvering tests which should include a reversal of the drilling unit from full speed ahead to full speed astern. All tests necessary to demonstrate that each item of plant and the system as a whole are satisfactory for duty are to be performed. Immediately prior to trials, the insulation resistance is to be measured and recorded.

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## PART

# 6

## CHAPTER 2 Surveys After Construction

### SECTION 1 Conditions for Surveys After Construction

#### 1 Definitions (2008)

##### 1.1 Active Corrosion

*Active Corrosion* means gradual chemical or electrochemical attack on a metal resulting from a reaction with its environment and producing loose scale.

##### 1.3 Allowable Corrosion or Wastage Limit

*Allowable Corrosion* or *Wastage Limit* is the acceptable corrosion limit for the MODU's structure in a given area. Also known as *Allowable Limit*.

##### 1.5 Ballast Tank

A *Ballast Tank* is a tank which is used for the carriage of water ballast.

##### 1.7 Close-up Survey

A *Close-up Survey* is a survey where the details of structural components are within close visual inspection range of the Surveyor, i.e. normally within hand reach.

##### 1.9 Critical Structural Areas

*Critical Structural Areas* are locations which have been identified from calculation to require monitoring or from the service history of the subject unit or from similar sister units to be sensitive to cracking, buckling or corrosion which would impair the structural integrity of the unit.

##### 1.11 Excessive Corrosion

*Excessive Corrosion* is an extent of corrosion that exceeds the allowable limit.

##### 1.13 Extensive Area of Corrosion

*Extensive Area of Corrosion* is corrosion of hard and/or loose scale, including pitting, over 70% or more of the plating surface in question, accompanied by evidence of thinning.

### 1.15 Girth Belt

A *Girth Belt* includes the following;

- *Surface-Type Units*: Deck, bottom, side shell and longitudinal bulkhead plating and internal framing.
- *Column-Stabilized Units*: Column and bracing plating and internals as deemed necessary. Deck sides and bottom of lower hulls between columns, including internal stiffeners as deemed necessary.
- *Self-Elevating Units*: Deck, bottom, side shell, internal framing of preload tanks and leg well structure.

### 1.17 Localized Corrosion

*Localized Corrosion* is by name local in nature and may be caused by local breakdown in coating from contact damage, insufficient penetration or at areas of stress concentration.

### 1.19 Overall Corrosion

*Overall Corrosion* appears as a non-protective rust which can uniformly occur on tank internal surfaces that are uncoated, or where coating has totally deteriorated. The rust scale continues to break off, exposing fresh metal to corrosive attack. Thickness cannot be judged visually until excessive loss has occurred.

### 1.21 Overall Survey

*Overall Survey* is a survey intended to report on the overall condition of the structure and to determine the extent of additional close-up surveys.

### 1.23 Panel

*Panel* is the area between adjacent main frames from stiffener to stiffener.

### 1.25 Pitting Corrosion

*Pitting Corrosion* is a localized corrosion of a metal surface that is confined to a small area and takes the form of cavities called pits.

### 1.27 Prompt and Thorough Repair

*Prompt and Thorough Repair* is defined as a permanent repair completed at the time of the survey to the satisfaction of the Surveyor.

### 1.29 Representative Spaces/Tanks

*Representative Spaces/Tanks* are those which are expected to reflect the condition of other spaces of similar type and service and with similar corrosion preventive systems. When selecting representative spaces, account should be taken of the service and repair history onboard and identifiable critical and/or Suspect Areas.

### 1.31 Spaces

*Spaces* are separate compartments including tanks, cofferdams, machinery spaces, voids and other internal spaces.

### 1.33 Substantial Corrosion

*Substantial Corrosion* is an extent of corrosion such that assessment of corrosion pattern indicates wastage in excess of 75% of the allowable corrosion, but within the acceptable limits.

### 1.35 Suspect Areas

*Suspect Areas* are locations showing substantial and/or are considered by the Surveyor to be prone to rapid wastage.

### 1.37 Weld Metal Corrosion

*Weld Metal Corrosion* is defined as preferential corrosion of weld deposit. The most likely reason for this attack is galvanic action with the base metal which may start as pitting and often occurs on hand welds as opposed to machine welds.

### 1.39 Wind and Water Strakes

*Wind and Water Strakes* are the two (2) strakes or equivalent area located in the vicinity of the load waterline, operating draft or operating depth of the unit. For Self-elevating Units this is the area of the leg components in the vicinity of the operating water depth. For column stabilized units this will include portions of columns and bracing members in the vicinity of the operating draft of the unit.

## 3 Notification and Availability for Survey (1996)

The Surveyors are to have access to classed units at all reasonable times. The Owners or their representatives are to notify the Surveyors on occasions when parts of the structure not ordinarily accessible can be examined. The Surveyors are to undertake all surveys on classed units upon request, with adequate notification, of the Owners or their representatives and are to report thereon to the Committee. Should the Surveyors find occasion during any survey to recommend repairs or further examination, notification is to be given immediately to the Owners or their representatives in order that appropriate action may be taken. The Surveyors are to avail themselves of every convenient opportunity for carrying out periodical surveys in conjunction with surveys of damages and repairs in order to avoid duplication of work. See also 1-1-10/5 of the *ABS Rules for Classification of Offshore Units and Structures (Part 1)*.

## 5 Annual Surveys (1998)

Annual Surveys are to be made within three months before or after of each annual anniversary date of the crediting of the previous Special Survey of Hull, or original construction date. For units on Continuous Survey, all Continuous Survey requirements for those parts (items) due are generally to be completed each year. The Annual Survey will not be credited and the Certificate of Classification will not be endorsed unless Continuous Survey items which are due or overdue at the time of the Annual Survey are either completed or granted an extension.

## 7 Special Periodical Surveys (1993)

A Special Periodical Survey is to be completed within five years after the date of build or after the crediting date of the previous Special Periodical Survey. The interval between Special Periodical Surveys may be reduced by the Committee. If a Special Periodical Survey is not completed at one time, it will be credited as of the completion date of the survey, but not later than five years from date of build or from the date recorded for the previous Special Periodical Survey. If the Special Periodical Survey is completed prematurely but within three months prior to the due date, the Special Periodical Survey will be credited to agree with the effective due date.

Special consideration may be given to Special Periodical Survey requirements in the case of mobile offshore drilling units of unusual design, in lay-up or in unusual circumstances. The Committee reserves the right to authorize extensions of Rule-required Special Periodical Surveys under extreme circumstances.

A Special Periodical Survey may be commenced at the fourth annual survey and be continued with a view to completion by the due date. In connection with the preparation for the Special Periodical Survey, thickness gaugings, as required for the forthcoming Special Periodical Survey, are to be taken to the extent accessible and practical in connection with the fourth annual survey.

Where the Special Periodical Survey is commenced prior to the fourth annual survey, the entire survey is normally to be completed within 12 months if such work is to be credited to the Special Periodical Survey.

## 9 Continuous Surveys

### 9.1

At the request of the Owner, and upon approval of the proposed arrangements, a system of Continuous Survey may be undertaken whereby the Special Periodical Survey requirements are carried out in regular rotation to complete all requirements of the particular Special Periodical Survey within a five-year period. The completion date will be recorded to agree with the original due date of the cycle. If the Continuous Survey is completed prematurely but within three months prior to the due date, the Special Periodical Survey will be credited to agree with the effective due date. The Committee reserves the right to authorize extensions of Rule-required Special Continuous Surveys under extreme circumstances.

Each part (item) surveyed becomes due again for survey approximately five years from the date of the survey. For Continuous Surveys, a suitable notation will be entered in the *Record* and the date of completion of the cycle published. If any defects are found during the survey, they are to be dealt with to the satisfaction of the Surveyor.

### 9.3

At a survey approximately four years after each Continuous Survey of Hull has been credited, all accessible thickness gaugings, as required for the forthcoming Special Periodical Survey, are to be taken.

## 11 Drydocking Survey or Equivalent (1992)

### 11.1 Interval

For units operating in salt water, a Drydocking Survey is to be carried out two times in any five-year period with an interval not exceeding three years between Drydocking Surveys.

For units operating in salt water for less than six months each year, the maximum interval is not to exceed three years. For units operating in fresh water the interval between Drydocking Surveys is not to exceed five years.

Consideration may be given to special circumstances which may justify an extension of the interval. An underwater inspection by a diver may be required for such extensions.

## 13 Underwater Inspection in Lieu of Drydocking Survey

Underwater inspection by diver equivalent to a Drydocking Survey may be carried out at each Drydocking Survey up to and including Special Survey No. 4. The underwater inspection is to be carried out in accordance with this Section and Section 6-2-6 of these Rules.

For each Drydocking after Special Survey No. 4, requests to carry out an Underwater Inspection in Lieu of Drydocking in accordance with previously approved plans are to be submitted for consideration well in advance of the proposed survey. Approvals to carry out the Underwater Inspection in Lieu of Drydocking after Special Survey No. 4 are to be made available onboard for the Surveyor's reference.

## 15 Reactivation Surveys

In the case of drilling units which have been out of service for an extended period, the requirements for surveys on reactivation will be specially considered in each case with due regard being given to the status of surveys at the time of the commencement of the lay-up period, the length of the period and conditions under which the unit had been maintained during that period.

## 17 Partially Complete Surveys

When a Survey is partially complete, the Surveyor is to report immediately upon the work done in order that Owners and the Committees may be advised of the parts still to be surveyed.

## 19 Damage, Failure and Repair (1996)

### 19.1 Examination and Repair

Damage, failure, deterioration or repair to hull, legs, columns or other structures, machinery or equipment, which affects or may affect classification, is to be submitted by the Owners or their representatives for examination by a Surveyor at first opportunity. All repairs found necessary by the Surveyor are to be carried out to the Surveyor's satisfaction.

### 19.3 Repairs

Where repairs to hull, legs, columns or other structures, machinery or equipment, which affect or may affect classification, are planned in advance to be carried out, a complete repair procedure, including the extent of proposed repair and the need for Surveyor's attendance, is to be submitted to and agreed upon by the Bureau reasonably in advance. Failure to notify the Bureau in advance of the repairs may result in suspension of the unit's classification until such time as the repair is redone or evidence submitted to satisfy the Surveyor that the repair was properly carried out.

*Note:* The above applies also to repairs during voyage or on site.

The above is not intended to include maintenance and overhaul to hull, other structures, machinery and equipment in accordance with the recommended manufacturer's procedures and established marine practice and which does not require Bureau approval. However, any repair as a result of such maintenance and overhauls which affects or may affect classification is to be noted in the unit's log and submitted to the Surveyor as required by 6-2-1/19.1.

### 19.5 Representation

Nothing contained in this section or in a rule or regulation of any government or other administration, or the issuance of any report or certificate pursuant to this section or such a rule or regulation, is to be deemed to enlarge upon the representations expressed in 1-1-1/1 through 1-1-1/7 of the *ABS Rules for Classification of Offshore Units and Structures (Part 1)*, and the issuance and use of any such reports or certificates are to be governed in all respects by 1-1-1/1 through 1-1-1/7 of the above-referenced Part 1.

## 21 Alterations

No alterations which affect or may affect classification or the assignment of load lines are to be made to the hull or machinery of a classed unit unless plans of the proposed alterations are submitted and approved by the ABS Technical Office before the work of alterations is commenced, and such work, when approved, is to be carried out to the satisfaction of the Surveyor. Nothing contained in this Section or in a rule or regulation of any government or other administration or the issuance of any report or certificate pursuant to this section or such a rule or regulation is to be deemed to enlarge upon the representations expressed in subsections 1-1-1/1 through 1-1-1/7 *ABS Rules for Classification of Offshore Units and Structures (Part 1)* and the issuance and use of any such reports or certificates are to in all respects be governed by subsections 1-1-1/1 through 1-1-1/7 of the above-referenced Part 1.

## 23 Welding and Replacement of Materials

### 23.1 Ordinary and Higher-Strength Structural Steels

Welding or other fabrication performed on the structural steels listed in 2-1-2/Table 5 and 2-1-3/Table 5 is to be in accordance with the requirements in Section 2-4-1 of the *ABS Rules for Materials and Welding (Part 2)*.

### 23.3 Special Materials

Welding or other fabrication performed on other steels of special characteristics or repairs or renewals of such steel or adjacent to such steel is to be accomplished with procedures approved for the special materials involved. The procedures are to be in accordance with the information provided under Section 1-1-9 of the *ABS Rules for Classification of Offshore Units and Structures (Part 1)* and Chapter 4 of the *ABS Rules for Materials and Welding (Part 2)*. Substitution of steels differing from those originally installed is not to be made without approval.



## PART

# 6

## CHAPTER 2 Surveys After Construction

### SECTION 2 Survey Pre-planning

#### 1 **Special Surveys, Drydocking Surveys, and Underwater Inspections in Lieu of Drydocking (2008)**

Plans and procedures for Special Surveys, Drydocking Surveys, and Underwater Inspections in Lieu of Drydocking are to be made available onboard for the purpose of carrying out an on-board pre-planning of the survey with the Surveyor.

The planning document is intended to identify critical structural areas and to stipulate the minimum extent, location and means of close up inspection, extent and type of NDT, and thickness measurements with respect to the major structural components as well as to nominated areas.

The document should be worked out by the Owner in co-operation with the Bureau and submitted for review well in advance of the survey.

The basis for nomination of the critical structural areas is an assessment in consideration of possible deterioration and designated fatigue prone areas where the following elements on a particular unit are taken into account:

- Design feature with relatively low fatigue life
- Former history available at Owner's or ABS offices with respect to corrosion, cracking, buckling, indents and repairs for the particular unit as well as similar units
- Unit's service history since last survey (e.g., area of operation, environmental data, water depth, air gap for SEDU's, length of time at each location etc.)

The degree of criticality should be judged and decided on the basis of the units structural and fatigue analyses and recognized principles and practice.

The planning document should contain:

- Main particulars
- Plans to include details of major brace and column connections on column-stabilized units and details of leg and leg-to-spudcan connections
- Jackhouse/jackcase-to-deck connections, on self-elevating units
- Detailed information on NDT methods and locations
- List of tanks with information on use, protection and condition of coating
- Corrosion risk of tank and other major structural members

- Design risk nomination of major structure
- Nomination of areas for close up surveys and NDT
- Nomination of areas of structure for thickness measurement
- List of acceptable corrosion allowance of different structures
- Method and extent of cleaning inspection points

PART

# 6

CHAPTER **2 Surveys After Construction**

SECTION **3 Annual Surveys – Hull and Machinery**

**1 Parts to be Examined – Hull**

**1.1 All Types of Mobile Offshore Drilling Units**

At each Annual Survey, the exposed parts of the hull, the deck, deckhouses, structures attached to the deck, derrick substructure, including supporting structure, accessible internal spaces, and the applicable parts listed in 6-2-3/1.1.1 through 6-2-3/1.1.8 below are to be generally examined and placed in satisfactory condition as found necessary and reported upon.

**1.1.1**

Hatchways, manholes, and other openings in the freeboard deck (bulkhead deck) and enclosed superstructure decks.

**1.1.2**

Machinery casings and covers, companionways, and deckhouses protecting openings in freeboard or enclosed-superstructure decks.

**1.1.3**

Portlights together with deadcovers, cargo ports, bow or stern entries, chutes, and similar openings in hull sides or ends, below the freeboard deck or in way of enclosed superstructures.

**1.1.4**

Ventilators, tank vent pipes together with flame screens, and overboard discharges from enclosed spaces on or below the freeboard deck.

**1.1.5**

Watertight bulkheads and end bulkheads of enclosed superstructures.

**1.1.6**

Closing appliances for all of the above, including hatch covers, doors, check valves together with their respective securing devices, dogs, sills, coaming, and supports.

**1.1.7**

Freeing ports together with bars, shutters, and hinges.

## 1.1.8

Protection of the crew, guard rails, lifelines, gangways, and deckhouses accommodating crew.

### 1.3 Surface-Type Units

The hull and deck structure around the drilling well (moon pool) and in vicinity of any other structural changes-in section, slots, steps or openings in the deck or hull, and the back-up structure in way of structural members or sponsors connecting to the hull.

### 1.5 Self-Elevating Units

Jackhouse structures and attachment to upper hull or platform. Jacking or other elevating systems and leg guides, externally. Legs as accessible above the waterline. Plating and supporting structure in way of leg wells.

### 1.7 Column-Stabilized Units

Columns, diagonals and other parts of the upper columns, diagonals and other parts of the upper hull supporting structure as accessible above the waterline. The upper hull structure around the drilling well (moon pool) and in vicinity of any other structural changes-in section, slots, steps or openings in the upper hull structure.

## 3 Machinery

### 3.1 Self-Propelled Units (1996)

On self-propelled units, a general examination in accordance with Section 7-6-2 of the *ABS Rules for Survey After Construction (Part 7)* should be made of engines, boilers, steering machinery, windlass, auxiliary machinery, pumps, piping, electrical installations, including those in hazardous areas, and fire-extinguishing apparatus required for classification as outlined in Section 4-4-1 of these Rules.

### 3.3 Non-Self-Propelled Units (1996)

On non-self-propelled units, a general examination is to be made of items required for classification such as auxiliary machinery, pumps, piping, electrical installations, including those in hazardous areas, and fire-extinguishing apparatus as outlined in Section 4-4-1 of these Rules. Fire mains are to undergo satisfactory pressure testing.

## 5 Alterations and Position of Load Lines

The Surveyors are to be satisfied at each Annual Survey that no material alterations have been made to the unit, its structural arrangements, subdivision, superstructure, fittings and closing appliances upon which the load line assignment is based.

## 7 Corrosion Control Systems

The type, location and extent of corrosion control (i.e., coatings, cathodic protection systems, etc.) as well as effectiveness, and repairs or renewals should be reported on at each survey. Particular attention is to be given to corrosion control systems in ballast tanks, free-flooding areas and other locations subjected to sea water from both sides.

PART

# 6

CHAPTER **2 Surveys After Construction**

SECTION **4 Special Surveys – Hull and Machinery**

**1 Special Survey No. 1 – Hull (1996)**

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

**1.1 General – All Types of Mobile Offshore Drilling Units**

**1.1.1**

The hull or platform structure, including tanks, watertight bulkheads and decks, cofferdams, void spaces, sponsons, chain lockers, duck keels, helicopter pad, machinery spaces, peak spaces, steering gear spaces, and all other internal spaces, are to be examined externally and internally for damage, fractures or excessive wastage. Thickness gauging of plating and framing may be required where wastage is evident or suspected.

**1.1.2**

All tanks, compartments and free-flooding spaces throughout the drilling unit are to be examined externally and internally for excess wastage or damage. Internal examination of spud cans and mats is to be specially considered. Watertight integrity of tanks, bulkheads, hull, bulkhead deck and other compartments is to be verified by visual inspection. Suspect areas may be required to be tested for tightness, nondestructive tested or thickness gauged. Tanks and other normally-closed compartments are to be ventilated, gas-freed and cleaned as necessary to expose damage and allow for a meaningful examination for excessive wastage. Internal examination and testing of void spaces, compartments filled with foam or corrosion inhibitors, and tanks used only for lube oil, light fuel oil, diesel oil or other noncorrosive products may be waived, provided that upon a general examination, the Surveyor considers their condition to be satisfactory. External thickness gauging may be required to confirm corrosion control.

**1.1.3**

Attachments of anchor racks and anchor cable fairleads are to be examined. For drilling units with **E**, **M** or **P** Class Notations, the anchors, cables and their respective handling means are to be examined.

## 1.1.4

Structures such as derrick substructure and supporting structure, jackhouses, pipe racks, deck houses, superstructures, helicopter landing areas, raw water (seawater intake) towers and their respective attachments to the deck or hull.

## 1.1.5

Foundations and supporting headers, brackets and stiffeners for drilling-related apparatus, where attached to hull, deck, superstructure or deck house.

## 1.1.6

Survey of parts of the unit which are underwater and inaccessible to the Surveyor may be accepted on the basis of an examination by a qualified diver carried out in the presence of the Surveyor. Video or photo records, nondestructive testing and thickness gauging may be required in addition to the diver's report. Refer to Section 6-2-6 of these Rules.

## 1.1.7 (1992)

At each Special Survey, thickness gaugings are to be carried out where wastage is evident or suspected. At Special Survey No. 2 and subsequent Special Surveys, representative gaugings will be required in accordance with 6-2-4/Table 1, 6-2-4/Table 2 and 6-2-4/Table 3. Special attention should be paid to splash zones on hulls, legs or related structure, and in ballast tanks, pre-load tanks, free-flooded spaces, spud cans and mats. The thickness gauging requirements indicated in the tables may be reduced or increased as deemed appropriate or necessary by the Surveyor in accordance with Notes 2 and 3 of the tables.

## 1.1.8

Where inspection of underwater joints is required, sufficient cleaning is to be carried out in way, and water clarity to be adequate, to permit meaningful visual, video, camera or NDT examination, as required. Every effort should be made to avoid cleaning damage to special coatings.

### 1.3 Surface-Type Units

## 1.3.1

Structural appendages and ducts for positioning units. Refer also to the latest edition of the *ABS Rules for Survey After Construction (Part 7)*, as applicable to vessels constructed in accordance with the *Steel Vessel Rules*.

### 1.5 Self-Elevating Units

## 1.5.1

All legs, including chords, braces, diagonals, gussets, racks, joints, together with leg guides are to be examined. Tubular or similar type legs are to be examined externally and internally, together with internal stiffeners and pinholes, as applicable.

## 1.5.2

Structure in, around and under jack-houses and leg wells.

## 1.5.3

Leg jacking or other elevating systems externally.

## 1.5.4

Leg connections to bottom mats or spud cans, including nondestructive testing of leg connections to mats or spud cans.

## 1.5.5

Jetting piping systems or other external piping, particularly where penetrating mats or spud cans.

## 1.5.6

Spud cans or mat.

*Note:* Spud cans and other bottom spaces subject to contact with, or accumulation of, bottom soil should be thoroughly ventilated and carefully monitored for pocketing or emission of hazardous gases prior to, and during, internal inspection.

Where the spud cans or mat are partly or entirely obscured below the mud line when the Special Survey is otherwise being completed, consideration will be given to postponement of these examinations until the next rig move.

## 1.7 Column-Stabilized Units (1996)

Connections of columns and diagonals to upper hull or platform and lower hull or pontoons. Joints of supporting structure, including diagonals, braces and horizontals, together with gussets and brackets. Internal continuation or back-up structure for the above.

## 3 Special Survey No. 2 and Subsequent

### 3.1 General

These surveys are to be at least as comprehensive as Special Survey No. 1, with special attention being given to the condition and thickness of material in high corrosion areas. The subsequent Special Surveys of ship or barge type units will include the requirements of the latest edition of the ABS *Rules for Survey After Construction (Part 7)*, as applicable to vessels constructed in accordance with the *Steel Vessel Rules*.

### 3.3 Thickness Gauging Requirements (2008)

Areas to be gauged are given in 6-2-4/Tables 1 through 3.

### 3.5 Nondestructive Testing (2008)

#### 3.5.1 Column-Stabilized Units

Extensive close up visual examination and Nondestructive Testing (NDT) of the major joints is to be carried out at each UWILD and Special Survey. 100% of the joints are to be subjected to this type of survey within a 5-year period after the completion of the 3<sup>rd</sup> special survey. The of number joints and associated internal continuation and back-up structure, plus any gussets or brackets that are to be subjected to NDT is to be determined by the Owner and the Bureau with consultation of the fatigue analysis and NDT results of previous surveys.

The following is an outline of some of the areas that will be subjected to close visual examination and extensive NDT at the UWILD and/or Special Surveys:

- i) Horizontal and diagonal bracing to columns and upper hull, together with gussets and brackets
- ii) Horizontal and diagonal bracing to pontoons, upper hull and columns, together with gussets and brackets

- iii)* Internal back-up structure for the above
- iv)* Brace-to-brace connections, together with gussets and brackets
- v)* Column connection to lower and upper hulls
- vi)* Fairleader connections to columns
- vii)* Highly stressed areas in way of the moon pool

### 3.5.2 Self-Elevating Units

Extensive close up visual examination and Nondestructive Testing (NDT) of major joints and areas deemed to be fatigue sensitive is to be carried out, at each UWILD and Special Survey. The number leg joints and associated structure that is to be subjected to NDT is to be determined by the Owner and the Bureau with input from the fatigue analysis and NDT results of previous surveys.

The following is an outline of some of the areas that will be subjected to close visual and extensive NDT at the UWILD and/or Special Surveys:

- i)* Leg-to-spudcan connections plus 2 bays of leg above the top of the spudcan
- ii)* Jackhouse/jackcase-to-deck connections
- iii)* Brace-to-chord connection in areas of leg that have been predominately in way of the upper and lower guides
- iv)* Leg-to-mat connections

### 3.5.3 Inspection Manual

It is recommended that an Inspection and Maintenance Manual be prepared and submitted to the Bureau for review and acceptance. This manual could have information on the type of steel used in the construction, as built welding procedures, sketches of each joint to surveyed and structural inspection NDT methods to be carried out.

### 3.5.4 Record Keeping

The following is an outline of what is expected as far as documentation of the NDT results for each survey:

- i)* Details of the areas surveyed and type of NDT carried out (i.e., sketches showing details of joints plus any internal back-up structure that is considered part of the structural joint).
- i)* The Owner shall keep a detailed record of what has been previously surveyed, the type of survey carried out (Visual, MPI, etc.) (e.g., list area/quadrant of joint surveyed, nature and extent of indication found, and how it was repaired).

## 5 Special Surveys – Machinery

### 5.1 Correlation with Hull Special Surveys

Main and auxiliary engines of all types for drilling units are to undergo Special Periodical Survey at intervals similar to those for Special Surveys on the Hull in order that both may be recorded at approximately the same time. In cases where damage has involved extensive repairs and examination, the survey thereon may be considered as equivalent to a Special Periodical Survey.



### 5.3 Parts to be Examined

On self-propelled units, in addition to the requirements for Annual Survey, the main and auxiliary machinery, including pressure vessels, should be surveyed in accordance with the requirements of the latest edition of the *ABS Rules for Survey After Construction (Part 7)*, as applicable to vessels constructed in accordance with the *Steel Vessel Rules*, and the following, as applicable.

On non-propelled units, in addition to the requirements for Annual Survey, at each Special Periodical Survey, special attention is to be given to the following requirements, as applicable.

#### 5.5

All openings to the sea, including sanitary and other overboard discharges together with the cocks and valves connected therewith, are to be examined internally and externally while the drilling unit is in drydock or at the time of underwater examination in lieu of drydocking, and the fastenings to the shell plating are to be renewed when considered necessary by the Surveyor.

#### 5.7

Pumps and pumping arrangements, including valves, cocks, pipes, and strainers, are to be examined. Nonmetallic flexible expansion pieces in the main salt-water circulating system are to be examined internally and externally. The Surveyor is to be satisfied with the operation of the bilge and ballast systems. Other systems are to be tested as considered necessary.

#### 5.9

The foundations of machinery are to be examined.

#### 5.11

Heat exchangers and other unfired pressure vessels (except those used solely for drilling operations and complying with a recognized standard) with design pressures over 0.7 bar (7 kgf/cm<sup>2</sup>, 100 psi) are to be examined, opened out or thickness gauged and pressure tested as considered necessary, and associated relief valves proven operable. Evaporators that operate with a vacuum on the shell need not be opened, but may be accepted on the basis of satisfactory external examination and operational test or review of operating records

## 7 Units with Propulsion-Assist or Dynamic Position Certification

Propulsion-assist and dynamic positioning equipment will be surveyed on the basis of “Special Periodical Surveys – Machinery” in accordance with the requirements of the *ABS Rules for Survey After Construction (Part 7)*.

## 9 Retractable Propulsion Thrusters

The component parts of oil-lubricated retractable propulsion thrusters are to be opened for examination at least every five years.

## 11 Special Features (All Types)

Mobile offshore drilling units may have many items of machinery and electrical equipment not found on conventional cargo vessels. Certain of these items are required for classification even if the unit is without propulsion machinery. Items to be especially examined and reported upon at all Special Surveys are as follows.

### 11.1 Hazardous Areas

Enclosed hazardous areas such as those containing open active mud tanks, shale shakers, degassers and demanders are to be examined and doors and closures in boundary bulkheads verified as effective. Electric lighting, electrical fixtures and instrumentation are to be examined, proven satisfactory and verified as explosion-proof or intrinsically safe. Ventilating systems, including ductwork, fans, intake and exhaust locations for enclosed restricted areas, are to be examined, tried out and proven satisfactory. Ventilating-air alarm system is to be proven satisfactory. Electric motors are to be examined, including closed-loop ventilating systems for large DC motors. Automatic power disconnect to motors in case of loss of ventilating air are to be proven satisfactory.

### 11.3 Remote Shutdown Arrangements (1996)

Remote shutdown arrangements for fuel-oil transfer service pumps and ventilating equipment, together with oil tank outlet valves, where capable of being remotely closed, are to be proven satisfactory. Emergency switches, where required by the Rules, for all electrical equipment, including main and emergency generators, except alarm and communication systems and lighting in vital areas such as escape routes and landing platforms, are to be proven satisfactory.

### 11.5 Fire Fighting Apparatus

A general examination of the fire detection and extinguishing apparatus is to be made in order that the Surveyor may be satisfied as to its efficient state. The following items are to be especially examined.

- Fire hoses, nozzles and spanners at each fire station
- Servicing of all portable soda-acid and foam extinguishers
- Weighing and recharging, as necessary, of all dry chemical and CO<sub>2</sub> extinguishers
- Fire pumps and piping, including operation and capacity
- Alarm systems

### 11.7 Leg Jacking Systems

On self-elevating type drilling units, leg jacking systems are to be examined and reported on. Pinions and gears of the climbing pinion gear train of rack and pinion systems are to be examined as far as practicable, to the Surveyor's satisfaction, by an effective crack detection method.

### 11.9 Piping Systems

Piping systems used solely for drilling operations and complying either with these Rules or a recognized standard as required by 4-2-1/1 are to be examined, as far as practical, operationally or hydrostatically tested to working pressure, to the satisfaction of the Surveyor.

### 11.11 Miscellaneous

Bilge alarm system, if fitted, is to be tested and proven satisfactory.

**TABLE 1**  
**Thickness Gauging Requirements for Surface-Type Units (1992)**

<i>Special Periodical Survey Number 1</i>	<i>Special Periodical Survey Number 2</i>	<i>Special Periodical Survey Number 3</i>	<i>Special Periodical Survey Number 4</i>
1) Suspect areas throughout the vessel	1) Suspect areas throughout the vessel 2) One transverse section of deck plating abreast the moon pool opening within the amidships 0.5L, together with internals in way as deemed necessary. Where vessel is configured with side ballast tanks, the plating and internals of the tanks are also to be gauged in way of the section chosen. 3) Moon pool boundary bulkhead plating.	1) Suspect areas throughout the vessel 2) Two girth belts of deck, bottom and side plating abreast the moon pool and one hatch opening within the amidships 0.5L together with internals in way as deemed necessary. Where vessel is configured with side ballast tanks, the plating and internals of the tanks to be gauged in way of the required belts, Remaining internals in ballast tanks to be gauged as deemed necessary. 3) Moon pool boundary bulkhead plating. 4) Internal in forepeak tank as deemed necessary.	1) Suspect areas throughout the vessel 2) A minimum of three girth belts of deck, bottom, side, and longitudinal-bulkhead plating in way of the moon pool and other areas within the amidships 0.5L, together with internals in way (including in perimeter ballast tanks, where fitted in way of belts). 3) Moon pool boundary bulkhead plating. 4) Internals in forepeak and after peak tanks as deemed necessary. 5) Lowest strake of all transverse bulkheads in hold spaces. Remaining bulkhead plating to be gauged as deemed necessary. 6) All plates in two wind and water strakes, port and starboard, full length. 7) All exposed main deck plating full length and all exposed first-tier super-structure deck plating (poop, bridge and forecastle decks). 8) All keel plates full length plus additional bottom plating as deemed necessary by the Surveyor, particularly in way of cofferdams and machinery spaces. 9) Duct keel or pipe tunnel plating or pipe tunnel plating and internals as deemed necessary.

*Notes:*

- 1 With reference to ballasting history and arrangement and condition of coatings, tanks and specific thickness gauging locations should be selected which will provide the best representative sampling of areas likely to be most exposed to corrosion effect.
- 2 Gauging requirements noted may be modified as deemed necessary or appropriate by the Surveyor if the structure remains effectively protected against corrosion by a permanent type special coating.
- 3 In any case where excessive wastage is evident, additional gaugings may be required.

**TABLE 2**  
**Thickness Gauging Requirements for Self-Elevating Units (1992)**

<i>Special Periodical Survey Number 1</i>	<i>Special Periodical Survey Number 2</i>	<i>Special Periodical Survey Number 3</i>	<i>Special Periodical Survey Number 4</i>
1) Suspect areas throughout the unit (particular attention to be paid to the legs in way of the Splash Zone).	1) Suspect areas throughout the unit. 2) Legs in way of Splash Zone. 3) Primary application structures where wastage is evident. 4) Representative gaugings of upper hull deck and bottom plating and internals of one preload (ballast) tank.	1) Suspect areas throughout the unit. 2) Representative gaugings, throughout, of special and primary application structures. 3) Leg well structure. 4) Representative gaugings of deck, bottom, and side shell plating of hull and mat. 5) Representative gaugings of upper hull deck and bottom plating and internals of at least two preload (ballast) tanks.	1) Suspect areas throughout the unit. 2) Comprehensive gaugings, throughout, of special and primary application structures. 3) Leg well structure. 4) Representative gaugings of deck, bottom, and side shell plating of hull and mat. 5) Substructure of derrick as deemed necessary. 6) Representative gaugings of internals of all preload (ballast) tanks.

*Notes:*

- 1 With reference to the operating history and arrangement and condition of coatings, specific thickness gauging locations should be selected which will provide the best representative sampling of areas likely to be most exposed to corrosion effect.
- 2 Gauging requirements noted may be modified as deemed necessary or appropriate by the Surveyor if the structure remains effectively protected against corrosion by a permanent type special coating.
- 3 In any case where excessive wastage is evident, additional gaugings may be required.
- 4 Structural application designation (special, primary, secondary) are defined in 3-1-3/5.

**TABLE 3**  
**Thickness Gauging Requirements for Column-Stabilized Units (1992)**

<i>Special Periodical Survey Number 1</i>	<i>Special Periodical Survey Number 2</i>	<i>Special Periodical Survey Number 3</i>	<i>Subsequent Special Periodical Survey</i>
1) Suspect areas throughout the unit. 2) Columns and bracings where wastage is evident in Splash Zone.	1) Suspect areas throughout the unit. 2) Representative gaugings of columns and bracings in Splash Zone together with internals in way as deemed necessary. 3) Special and primary application structure where wastage is evident.	1) Suspect areas throughout the unit. 2) Representative gaugings, throughout, of special and primary application structures. 3) 1 girth belt of each of 2 columns and 2 bracings in Splash Zone together with internals in way as deemed necessary. 4) Chain locker internals as deemed necessary. 5) Lower hulls in way of mooring lines where wastage is evident. 6) 1 girth belt of each lower hull between one set of columns.	1) Suspect areas throughout the unit. 2) Comprehensive gaugings, throughout, of special and primary application structures. 3) 1 girth belt of each of one-half of the columns and bracings in Splash Zone and internals in way as deemed necessary (i.e., gauge half of the unit's columns and bracings in Splash Zone). 4) Chain locker internals as deemed necessary. 5) Lower hulls in way of mooring lines where wastage is evident. 6) 1 girth belt of each lower hull between one set of columns. 7) Representative gaugings of substructure of drilling derrick.

*Notes:*

- 1 With reference to the ballasting history and arrangement and condition of coatings, tanks and specific thickness gauging locations should be selected which will provide the best representative sampling of areas likely to be most exposed to corrosion effect.
- 2 Gauging requirements noted may be modified as deemed necessary or appropriate by the Surveyor if the structure remains effectively protected against corrosion by a permanent type special coating.
- 3 In any case where excessive wastage is evident, additional gaugings may be required.
- 4 Structure application designations (special, primary, secondary) are defined in 3-1-3/5.

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## PART

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## CHAPTER 2 Surveys After Construction

## SECTION 5 Drydocking Survey or Equivalent

### 1 Interval

For units operating in salt water, a Drydocking Survey is to be carried out two times in any five year period with an interval not exceeding three years between Drydocking Surveys.

For units operating in salt water for less than six months each year, the maximum interval is not to exceed three years. For units operating in fresh water, the interval between Drydocking Surveys is not to exceed five years.

Consideration may be given to special circumstances which may justify an extension of the interval. An underwater inspection by a diver may be required for such extensions.

### 3 Underwater Inspection in Lieu of Drydocking Survey

Underwater inspection by diver equivalent to a Drydocking Survey may be carried out at each Drydocking Survey up to and including Special Survey No. 4. The underwater inspection is to be carried out in accordance with this Section and Section 6-2-6 of these Rules.

For each drydocking after Special Survey No. 4, requests to carry out an Underwater Inspection in Lieu of Drydocking in accordance with previously approved plans are to be submitted for consideration well in advance of the proposed survey. Approvals to carry out the Underwater Inspection in Lieu of Drydocking after Special Survey No. 4 are to be made available onboard for the Surveyor's reference.

### 5 Parts to be Examined

#### 5.1 Surface-type Units (Ship or Barge Type Units)

External surfaces of the hull, keel stem, stern frame, rudder, nozzles, and sea strainers are to be selectively cleaned and examined together with appendages, the propeller, exposed parts of stern bearing assembly, rudder pintle and gudgeon securing arrangements, sea chests and strainers and their fastenings. Propeller shaft bearing, rudder bearing, and steering nozzle clearances are to be ascertained and reported upon.

### 5.3 Self-Elevating Units

External surfaces of the upper hull or platform, spud cans, mat, underwater areas of legs, together with their connections, as applicable, are to be selectively cleaned and examined.

At each Drydocking Survey (or equivalent) after Special Survey No. 2, the satisfactory condition of the internal structure of the mat or spud cans, as accessible, is to be verified.

Leg connections to mat and spud cans are to be nondestructively tested and examined at each Drydocking Survey. Nondestructive testing may be required of areas found to be suspect.

### 5.5 Column-Stabilized Units

External surfaces of the upper hull or platform, footings, pontoons or lower hulls, underwater areas of columns, bracing and their connections, as applicable, are to be selectively cleaned and examined.

Nondestructive testing may be required of areas found to be suspect.

Sea chests and strainers are to be cleaned and examined.

External portions of propulsion units are to be examined.

### 5.7 Ballast and Preload Spaces – All units

In conjunction with Drydocking Surveys (or equivalent) after Special Survey No. 1 and between subsequent Special Surveys, the following ballast and preload spaces are to be internally examined and the effectiveness of coatings or corrosion control arrangements are to be verified either visually, by indicator strips or by thickness gauging (as considered necessary), placed in satisfactory condition, as found necessary, and reported upon.

#### 5.7.1 Surface-Type Units.

One peak tank and at least two other representative ballast tanks between the peak tank bulkheads used primarily for water ballast.

#### 5.7.2 Self-Elevating Units

Representative ballast tanks or free-flooding compartments in mat or spud cans, if accessible, and at least two representative upper hull salt water tanks on mat supported units or two representative preload tanks on independent leg units.

#### 5.7.3 Column-Stabilized Units

Representative ballast tanks in footings, lower hulls or free-flooding compartments as accessible, and at least two ballast tanks in columns or upper hull, if applicable.

### 5.9 All Units

#### 5.9.1 Internal Examinations of Tanks and Voids

All tanks and voids which are to be internally examined are to be thoroughly ventilated and gas-freed prior to being entered and are to be carefully monitored for pocketing or emissions of hazardous gases during examination.

#### 5.9.2 Sea Valves

For Underwater Inspection in Lieu of Drydocking Survey associated with Special Surveys, means are to be provided to permit the opening up of all sea valves for internal examination.



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## CHAPTER 2 Surveys After Construction

## SECTION 6 Underwater Inspection in Lieu of Drydocking

### 1 General

Following are the procedures and conditions under which a properly conducted underwater inspection may be credited as a Drydocking Survey.

### 3 Conditions

#### 3.1 Limitations

Underwater Inspection in lieu of Drydocking Survey may not be acceptable where there is record of abnormal deterioration or damage to the underwater structure, or where damage affecting the fitness of the unit is found during the course of the survey.

#### 3.3 Thickness Gauging and Nondestructive Testing

Underwater or internal thickness gaugings of suspect areas may be required in conjunction with the underwater inspection. Means for underwater nondestructive testing may also be required for fracture detection.

#### 3.5 Plans and Data

Approved plans and procedures for the survey are to be made available onboard for the purpose of carrying out an onboard preplanning of the survey with the Surveyor. These should include nomenclature of underwater parts and drawings or forms for laying out the areas to be surveyed, the extent of hull cleaning, nondestructive testing locations (including NDT methods) and for mapping damage or deterioration found. The examination of items associated with the Special or Continuous Surveys and Tail Shaft Surveys is to be included in the plans.

For each drydocking after Special Survey No. 4, requests to carry out an Underwater Inspection in Lieu of Drydocking in accordance with the previously approved plans are to be submitted for consideration well in advance of the proposed survey. Approvals to carry out the Underwater Inspection in Lieu of Drydocking after Special Survey No. 4 are to be made available onboard for the Surveyors' reference.

#### 3.7 Underwater Conditions

The areas to be surveyed are to be sufficiently clean and the sea water clear enough to permit meaningful examination and photography (if necessary) by the diver. Overall or spot cleaning may be required by the attending Surveyor.

## 5 Physical Features

The following physical features are to be incorporated into the unit's design in order to facilitate the underwater inspection. When verified, they will be noted in the unit's Classification for reference at subsequent surveys.

### 5.1 Stern Bearing

For self-propelled units, means are to be provided for ascertaining that the seal assembly on oil-lubricated bearings is intact and for verifying that the clearance or wear-down of the stern bearing is not excessive. For oil-lubricated bearings, this may only require accurate oil-loss-rate records and a check of the oil for contamination by sea water or white metal. For wood or rubber bearings, an opening in the top of the rope guard and a suitable gauge or wedge would be sufficient for checking the clearance by a diver. For oil-lubricated metal stern bearings, wear-down may be checked by external measurements between an exposed part of the seal unit and the stern tube bossing, or by use of the unit's wear-down gauge, where the gauge wells are located outboard of the seals, or the unit can be tipped. For use of the wear-down gauges, up-to-date records of the base depths are to be maintained onboard. Whenever the stainless steel seal sleeve is renewed or machined, the base readings for the wear-down gauge are to be re-established and noted in the unit's records and in the survey report.

### 5.3 Rudder Bearings

For self-propelled units with rudders, means and access are to be provided for determining the condition and clearance of the rudder bearings, and for verifying that all parts of the pintle and gudgeon assemblies are intact and secure. This may require bolted access plates and a measuring arrangement.

### 5.5 Sea Suctions

Means are to be provided to enable the diver to confirm that the sea suction openings are clear. Hinged sea suction grids would facilitate this operation.

### 5.7 Sea Valves

Means must be provided to examine any sea valve for the Drydocking Survey (Underwater Inspection) associated with the Special Survey.

## 7 Procedures

### 7.1 Exposed Areas

An examination of the outside of the structure above the waterline is to be carried out by the Surveyor. Means and access are to be provided to enable the Surveyor to accomplish visual inspection and nondestructive testing, as necessary.

### 7.3 Underwater Areas

An examination of the entire unit below the waterline is to be carried out by a suitably qualified diver using closed-circuit television with two-way communication capable of being monitored by the Surveyor, as required, or photographic documentation, or both, depending on the age and type of unit. This is to be supplemented by the Diver's Report, describing and attesting to the conditions found. A copy of this diver's report and pertinent photographs are to be submitted to the attending Surveyor for retention at the local office for five (5) years. Copies are also to be retained onboard, together with any video tapes, for reference.

## 7.5 Damage Areas

Damage areas are to be photographed. Internal examination, measurements, marking and thickness gauging of such locations may be a necessary adjunct as determined by the attending Surveyor. Means are to be provided for locating, orienting and identifying underwater surfaces in photographs or on video tapes.

## 9 Alternatives

The Bureau is prepared to consider alternatives to the above guidelines and would be pleased to consult with interested clients concerning means and details for accomplishing results no less effective.

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CHAPTER      **2      Surveys After Construction**

SECTION      **7      Specific Survey on Self-Elevating  
Units After Ocean Transit Tow**

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

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CHAPTER **2 Surveys After Construction**

SECTION **8 Tail Shaft Surveys**

Surveys are to be carried out in accordance with applicable paragraphs of the latest edition of the ABS *Rules for Survey After Construction (Part 7)*, as applicable to vessels constructed in accordance with the *Steel Vessel Rules*. However, due to low running hours on tail shafts of Mobile Offshore units, the interval between tail shaft surveys may be extended based on the following being to the satisfaction of the Surveyor:

- i) Diver's external examination of stern bearing and outboard seal area, including wear-down check as far as is possible.
- ii) Internal examination of the shaft area (inboard seals) in propulsion room(s).
- iii) Confirmation of lubricating oil records (satisfactory oil loss rate, no evidence of unacceptable contamination).
- iv) Shaft seal elements are examined/replaced in accordance with the seal manufacturer's recommendations.

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## PART

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## CHAPTER 2 Surveys After Construction

## SECTION 9 Boiler Surveys

### 1 Survey Interval

Waste-heat or fired auxiliary boilers used for the operation of the unit, excluding those intended solely for hotel load, are to be surveyed at intervals not exceeding 2½ years. However, where requested by the Owner and after an external examination of the boilers and review of operating and feedwater records, an extension of the auxiliary or waste-heat boiler surveys of up to six months may be granted.

### 3 Parts to be Examined

#### 3.1

At each survey, the boilers, superheaters and economizers are to be examined internally (water-steam side) and externally (fire side).

#### 3.3

Boiler mountings and safety valves are to be examined at each survey and opened as considered necessary by the Surveyor.

#### 3.5

The proper operation of the safety valves is to be confirmed at each survey.

#### 3.7

When considered necessary by the Surveyors, the boilers and superheaters are to be subjected to hydrostatic pressure test.

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## PART

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## CHAPTER 2 Surveys After Construction

### SECTION 10 Electrical Equipment

#### 1 Timing of Survey

The entire installation, including auxiliary and emergency equipment, is to undergo Special Periodical Survey every five years at the same time as the Special Survey of Machinery. The requirements of 6-2-10/3 and 6-2-10/5 are to be carried out at each Special Periodical Survey.

#### 3 Parts to be Examined

##### 3.1

Fittings and connections on main switchboards and distribution panels are to be examined, and care is to be taken to see that no circuits are over fused.

##### 3.3

Cables are to be examined as far as practicable without undue disturbance of fixtures.

##### 3.5

All generators are to be run under load, either separately or in parallel; switches and circuit breakers are to be tested.

##### 3.7

All equipment and circuits are to be inspected for possible development of physical changes or deterioration. The insulation resistance of the circuits is to be measured between conductors and between conductors and ground and these values compared with those previously measured. Any large and abrupt decrease in insulation resistance is to be further investigated and either restored to normal or renewed as indicated by the conditions found.

##### 3.9

The specified electrical auxiliaries for vital purposes, generators and motors are to be examined and their prime movers opened for inspection. The insulation resistance of each generator and motor is to be measured.

## **5 Main Propulsion Apparatus**

The windings of generators and motors are to be thoroughly examined and found or made dry and clean. Particular attention is to be paid to the ends of the windings of stator and rotors. After the winding have been cleaned and found dry, they are to be varnished, if necessary, with a standard insulating varnish applied preferably by spraying.

## **7 Major Repairs**

On the occasion of major repairs, the coils repaired or renewed are to be subjected to a dielectric strain test, as specified under the applicable parts of Part 4, Chapter 3. In addition, the circuits containing the repairs or renewals and coils which have been disturbed during repairs are to be subjected to dielectric strain tests for one minute by application of a potential of 125% of the maximum operating voltage of the circuits to which it is applied. The direct current fields of generators and motors are to be subjected for one minute to a test potential equal to 50% of the value specified under the applicable parts of Part 4, Chapter 3 and the whole apparatus operated under full-load conditions.

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CHAPTER **2 Surveys After Construction**

SECTION **11 Automatic and Remote-control Systems**

**1 Annual Survey**

At twelve month intervals from the date of installation, a survey is to be carried out during which a general examination of the automatic and remote-control system is to be made. The examination is to be made with a generator in operation and the control system energized to permit random checking of function indicators, alarms and such control actuators as may be operational. The Surveyor is to examine the machinery records to check the performance of the control system throughout the period since the last survey and to establish if there has been any abnormal functioning or failures and what corrective measures had been taken to preclude their recurrence. The machinery-space fire-detecting and bilge water-level alarms are to be checked for performance.

**3 Special Periodical Surveys**

Special periodical surveys are to be carried out at intervals of five years from the date of installation and are to include compliance with all requirements for Annual Surveys and with those that follow.

**3.1 Control Actuators**

All mechanical, hydraulic, and pneumatic control actuators and their power systems are to be examined and tested as considered necessary.

**3.3 Electrical**

The insulation resistance of the windings of electrical control motors or actuators is to be measured, with all circuits of different voltages above ground being tested separately, and is to be on the order of one-half to one megohm.

**3.5 Unattended Plants**

Control systems for unattended machinery spaces are to be subjected to dock trials at reduced power on the propulsion engine to check the proper performance of all automatic functions, alarms, and safety systems.

**5 Repairs or Alterations**

Major repairs or alterations to the automatic and remote-control systems are to be made, in accordance with approved plans, under the supervision and to the satisfaction of the Surveyor.

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## PART

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## CHAPTER 2 Surveys After Construction

## APPENDIX 1 Guide for Lay-up and Reactivation of Laid-up Mobile Offshore Drilling Units (2008)

### 1 Guide for Lay-up of Mobile Offshore Drilling Units

If requested by the Owner, the American Bureau of Shipping will undertake to review, survey, and confirm by issuance of a factual Lay-up Report, the actions taken to preserve and protect a unit in lay-up. Outlined below are precautions and procedures suggested to accomplish this objective; however, it is recognized that there may be a variety of equally satisfactory approaches to accomplish the same objective.

#### 1.1 Lay-up Requirements

- i) When the Bureau is notified by the owner that a unit has been laid-up, this status will be noted in the unit's survey status and in the *Record*, and surveys falling due during lay-up may be then held in abeyance until the unit reactivates, at which time they are to be brought up to date.
- ii) In the case of units which have been laid up for an extended period (six months or more), the requirements for the Reactivation Survey are to be specially considered in each case, due regard being given to the status of surveys at the time of the commencement of lay-up, the length of the lay-up period and the conditions under which the unit has been maintained during that period.
- iii) Where initial lay-up preparations and procedures have been submitted to the Bureau for review and survey, and re-verified annually by survey, consideration may be given to deducting part or all of the time in lay-up from the progression of survey intervals, or to modifying the requirements for up-dating surveys at time of reactivation.

#### 1.3 Safety and Protection

- i) Sufficient and qualified personnel should be available in order to maintain full-time fire, leakage, moorings and security watch of the unit. In addition, efficient independently-powered fire and bilge flooding alarms with exterior warning lights should be fitted for the machinery spaces, bilges and for other locations as deemed appropriate. The available watchmen should include a barge engineer and other personnel capable of operating the emergency communications equipment and taking emergency action pending arrival of outside assistance for fire extinguishing, leakage pumping, mooring adjustment or release, and general security. This includes the operation of the necessary emergency power sources, pumping units and any active fixed fire control apparatus. Qualified personnel for emergency ballasting in hurricane areas should be considered.

- ii) All the unit's fire safety equipment including emergency fire pump should be proved in good order immediately prior to lay-up and maintained prepared for immediate use thereafter.
- iii) The unit's fire lines should be proven in good condition before draining. Drains should be kept only sufficiently open to allow drainage of condensate. Alternatively, the fire lines may be filled with inhibited fresh water, including anti-freeze if necessary. The International Shore connection should be loosely installed and its location prominently marked. Fire line valve stems should be freed up and lubricated.
- iv) Oxygen breathing apparatus and flotation escape equipment should be provided and maintained immediately available for the watchmen or lay-up crews.
- v) All ventilator and air intake or exhaust openings should be adequately covered. Supply and exhaust openings for necessary emergency diesel generator or fire pump engines should be arranged for immediate or automatic opening. All fire dampers should be freed-up and then secured in closed position. All fire division doors should be closed.
- vi) Effective and reliable means of communication such as an independently-powered radiotelephone should be provided for all-hours contact with firefighting, tug and rescue facilities, or central security base. A secondary communication system should be provided in the event of failure or damage to the primary means.
- vii) A source of power for providing emergency lighting, fire extinguishing water, and bilge pumping throughout the unit should be immediately available.  
  
Where the emergency source of power is a portable diesel generator set mounted on deck, care should be taken to ensure fire safety of the fuel and exhaust systems, fire extinguishing arrangements, weather protection, proper electrical installation, and electrical protective devices for the unit.
- viii) All loose flammable materials such as debris, oily rags, cotton waste, chemicals, additives, corrosives, old pyrotechnics, matches, unsealed painting oils and dregs, garbage, etc. should be removed from the unit. Arrangements should be made for safe containment and frequent removal of garbage produced by watch personnel.
- ix) All mud and cement storage, mixing and holding tanks together with associated piping and shale shaker system should be clean and gas-free.
- x) Machinery space bilges should be pumped dry and cleaned of all debris, oil or other flammable products.
- xi) Fuel and lube oil tanks should be wired or locked closed at the tank valve except where required for the emergency power supply engine.
- xii) All valves to or from the sea on floating units should be wired or locked closed except those actually required for use during lay-up in connection with emergency ballasting, fire extinguishing, pumping out or watch personnel service. In order to prevent excessive fouling and choking, the sea suction openings, except for emergency fire pump, should be covered over externally and/or protected with a slow acting biocide.
- xiii) On floating units, the anchor windlass should be proven to be in good order prior to lay-up, and anchors, chains or mooring cables checked. Where used as part of the lay-up mooring arrangements, the chains or mooring cable should be regularly checked for twists and chafing and shifted or padded as necessary. If not required for the mooring, an anchor should be prepared for emergency release. See also 6-2-A1/1.5.7.
- xiv) Hot work (i.e., welding or burning) should not be permitted during lay-up except under specially supervised safety control. No unshielded or open-flame devices such as portable heaters should be permitted on board. Safe smoking areas, if required, should be clearly marked.



- xv) The unit should be readily accessible and approachable for shore-based or floating firefighting and other emergency equipment at all times and tides.
- xvi) In the event of an emergency tow from lay-up while in deactivated condition, a towing pendant should be available. If the unit is self propelled the propeller shaft(s) should be blocked from turning by some positive means. The turning gear should not be used for this and should only be engaged when in use. Rudders, if fitted, should also be hydraulically locked or otherwise blocked amidships.

## 1.5 Preservation and Maintenance

### 1.5.1 Hull and Deck Equipment

The primary objective of lay-up is to protect the hull and deck equipment against accelerated corrosion, weathering damage and freezing.

*1.5.1(a)* The unit's external coating systems should be in good condition prior to lay-up. Consideration should be given to supplemental sacrificial anodes on submerged areas; e.g., externally along the side shell, on lower hulls or pontoons, columns and bracing members, legs, mats, spud cans, and in ballasted areas.

*1.5.1(b)* Impressed-current cathodic hull protection systems where fitted, should be maintained in operation if a continuous power source is available and readings logged weekly by watch personnel who should be advised of proper procedures in case of abnormal readings. If the unit is moored to another unit or shore power is used, the system may need to be modified or secured due to possible electrolytic interaction. This should be taken up with the system manufacturer.

*1.5.1(c)* Deck machinery should be thoroughly lubricated and operated in all modes before securing. Also refer to "Machinery" or "Electrical Installation."

*1.5.1(d)* The accommodation spaces, deck, and other hull water, steam and air piping should be drained and/blown clear and dry with air. Alternatively, they may be completely filled with chemically inert anti-freeze liquids compatible with the piping or tubing material. The latter should be carried out under the guidance of a chemical specialist. Salt water lines, including tank washing apparatus, should be flushed out with fresh water, drained and blown dry. (Note that this will require a good supply of fresh water on arrival at the lay-up site.)

*1.5.1(e)* The drill floor, derrick, substructure, topdrive and rotary table should be cleaned of all mud and grease. Drill floor and substructure drain holes and drain wells should be cleared to insure proper draining of rain water.

*1.5.1(f)* Jacking units, skidding apparatus, and raw water tower jacking gear assemblies should be cleaned and unprotected surfaces coated with a protective coating.

*1.5.1(g)* Air vents for water tanks and fuel oil may be left open. Flame arrestor arrangements on fuel tanks and adjacent cofferdams should be in good order.

*1.5.1(h)* Empty tanks should be ventilated as much as possible and condensate regularly removed or inhibited. Supplemental anodes and inhibitors should be considered for ballast tanks containing water.

*1.5.1(i)* All doors and side scuttles should be kept closed and deadcovers in place, except where in regular use by watch personnel. Machinery casing top openings and skylights should be kept closed and weathertight.

*1.5.1(j)* Hull hydraulic systems should be kept completely full of fluid. All hydraulic cylinders and ram assemblies should be actuated periodically to ensure capability for proper operation.

*1.5.1(k)* Wire radio antennae should be lowered and secured except for emergency communications antenna.

*1.5.1(l)* All loose items on deck should be properly secured against movement by wind or other external forces.

*1.5.1(m)* All exposed navigation equipment, drillers' consoles, derrickman's console and any other exposed gauge and meter panels should be protected with weathertight covers.

*1.5.1(n)* Galley exhaust grease collection apparatus should be cleaned. If in use by watch personnel, it should be re-cleaned monthly.

*1.5.1(o)* Potable water tanks not in use by watch personnel should be drained and left open for free ventilation. Alternatively, they may be left completely filled if not subject to freezing.

*1.5.1(p)* All deck electrical receptacles should be closed up weathertight. Deck mounted electrical or hydraulic controls should be protected by a weathertight cover.

*1.5.1(q)* Crane booms should be down and secured. Exposed wire rope such as for cranes, derrick falls, riser tensioner wire, lifeboat falls and mooring wires should be slushed with preservative grease, and where possible, removed from the blocks and stowed out of the weather. Fibrous mooring ropes and other cordage not in use should be stowed off the deck and out of the sun and weather.

*1.5.1(r)* Exposed deck fittings liable to corrosion seizing, such as hinges, clips, screw-dogs, roller fairleads, boom fittings and valve stems should be coated or injected with preservative grease.

## **1.5.2 Machinery Spaces, Machinery, and Drilling Equipment**

The machinery and related engine room equipment should be protected against accelerated or localized corrosion, seizing and freezing. This normally requires the use of stabilized or preservative lubricants, prevention of acid concentrations, and regularly scheduled rotation or movement of machinery parts to shift contact surfaces. There should be a means or source of power for lighting and for turning over machinery. Continuous heating for the machinery spaces, including steering gear room, to maintain a temperature a few degrees above atmospheric; or alternatively, complete dehumidification at 35% to 45% RH is normally required to prevent sweating or humidity corrosion damage.

*1.5.2(a)* Thrusters and all rotating machinery in the machinery spaces and in the pump rooms should be turned over several revolutions and stopped at a new position at least once a month. Where fitted, pressure lubrication systems should be actuated and cylinder lubricators manually operated prior to turning over the machinery. The steering gear on floating units should be operated and moved full travel at the same intervals. Deck machinery should be turned over at least quarterly.

*1.5.2(b)* Lube oil in engines should be thoroughly separated or dehumidified prior to shutting down, after which the oil should be periodically chemical analyzed to confirm stability and the absence of harmful acidity. Any lube oil reservoir or sump vents to the exposed atmosphere should be closed off and opened only to a dry space. Where tube oil tanks are contiguous with the hull plating, means of coping with accumulation of condensation should be provided for.

*1.5.2(c)* All other machinery should be thoroughly lubricated with a stable grease or oil before securing and at least annually thereafter. For reciprocating machinery this should include also some form of non-contaminating protection in the cylinders. There are various proprietary products available specifically for this purpose.

*1.5.2(d)* The bilges in machinery spaces should be thoroughly cleaned and pumped dry. If the unit has a water-lubricated stern bearing, the stern gland should be tightened up just sufficiently to stop leakage, and warning notice to this effect posted at propulsion control station.

*1.5.2(e)* The sea-water side of heat exchangers should be thoroughly cleaned of all sea growth or other organic products, washed through with fresh water, then drained, dried and closed up, or left open to a dehumidified space. Drains may be left partly open but should be clearly marked to this effect and connecting valves to the sea wired-closed. Alternatively, these heat exchangers may be kept completely filled with chemically inert liquid. This latter approach should be carried out under the guidance of a chemical specialist.

*1.5.2(f)* All water system heat exchangers, reservoirs and piping should be drained and blown dry. Alternatively, these may be protected by filling with a non-contaminating, chemically inert liquid or dry inert gas. This process should be carried out under the guidance of a chemical specialist

*1.5.2(g)* Air reservoirs should be fully charged, water drained and air outlet valve closed off at the tank. Alternatively, they may be opened, cleaned, dried and left open for free ventilation.

*1.5.2(h)* The unit's air conditioning and refrigeration systems should be pumped down and secured. Inert Gas systems should be completely drained, dried out, and secured with means for air circulation or dehumidification. Acidic areas may required to be neutralized

*1.5.2(i)* Drilling equipment left on the rig such as rotary, Kelly, tongs, wedges, BOP stacks, drill bits, etc. should be cleaned, secured and weather protected where exposed. The derrick hook and block should be secured against movement.

### **1.5.3 Boilers**

*1.5.3(a)* The boiler fire-side should be laid-up thoroughly clean in order to minimize external acidic corrosion from the absorption of atmospheric moisture by the products of combustion. Usual soot accumulation areas such as where tubes enter headers or water drum and around floor tubes require special attention. If water washing is resorted to for cleaning, the boiler should then be fired for about 12 hours to dry the residual moisture from the insulation and brickwork. Where feasible, alkaline wash water should be used. Final cleaning by dry method is recommended, after which the furnace openings should be left open for free ventilation.

*1.5.3(b)* The boiler water-steam side may be preserved by a wet method or a dry method. In either case the water-steam side of the entire boiler, including superheater and economizer, should be first washed clean of all residue and existing chemical concentrates.

If the dry method is employed, after thoroughly heat drying, the water-steam side of the boiler should be either charged with trays of desiccant and resealed, or left open top and bottom including a hand hole in each header for free ventilation to a dehumidified space or with a continuous source of heating inside the water drum. If desiccant is used, this should be renewed or re-dried at least monthly or changed on the basis of a moisture indicator, A third alternative is to keep the boiler empty, sealed and slightly pressurized with a dry inert gas.

If the wet system is employed, the entire boiler should be kept full under a slight head with chemically inert distilled water. The initial charging and occasional rechecks should be carried out under the guidance of a chemical specialist. If the wet system is employed, external space heating or dehumidification may be required to control sweating and consequent poulitice corrosion under insulation.

### **1.5.4 Boiler Stack Openings**

After securing the boiler and engines, all stack outlets should be provided with weathertight covers. If not in use, the galley stack should also be covered weathertight.

### 1.5.5 Electrical Installation

The electrical system should be protected against insulation deterioration, primarily from atmospheric moisture absorption or water ingress, and the rotating elements protected against corrosion damage in the bearings.

*1.5.5(a)* Before securing, electrical motors and generators should be thoroughly cleaned of carbon or other hygroscopic foreign matter, heat dried so as to obtain acceptable insulation resistance readings, and the bearings lubricated with a stable grease or oil. Any carbon brushes should be lifted to prevent spot corrosion on the commutator or slip rings. Insulation readings should be taken and recorded at least monthly thereafter and where found abnormal, immediately corrected by heating, drying or cleaning.

*1.5.5(b)* All electrical apparatus should be maintained internally a few degrees above atmospheric by means of built-in heaters, if fitted, or by other means such as a strip heaters or heat lamps. Alternatively, the humidity control may be maintained by opening the unit to the effects of a dehumidifier or by sealing the unit with desiccant inside. This latter approach would require replacement of the desiccant and re-sealing at least monthly or based on a moisture indicator.

*1.5.5(c)* Electrical junction boxes should be covered with either protective coatings or protective tape.

*1.5.5(d)* Switchboards, distribution panels, SCR panels, and explosion-proof motors should be protected against moisture absorption by use of heaters, heat lamps, dehumidifier, or by sealing with desiccant inside.

*1.5.5(e)* Jacking, skidding and deck machinery motor enclosures should be checked for watertightness and suitable driers placed inside or internal heaters provided.

*1.5.5(f)* Crane controls and motors should be provided with heaters or desiccant.

*1.5.5(g)* The gyro compass, radar, loran, radio, and automation electronic apparatus should be maintained heated and/or dehumidified in the same manner as above. The manufacturer should be consulted regarding the maintenance during lay-up of computer systems. Such equipment may be required to be operated periodically.

*1.5.5(h)* All liquid-filled storage batteries should be fully charged and if possible, maintained on trickle charge under weekly inspection.

*1.5.5(i)* All electrical switches for circuits not in regular use should be kept in open or disconnect position.

### 1.5.6 Tensioning System and Heave Compensators

The tensioner rams and heave compensators should be retracted and secured. All associated equipment should be cleaned, secured and unprotected surfaces coated with proper preservatives. Wire rope should be coated with preservative grease and if possible, removed from the blocks and stowed in a dry space.

### 1.5.7 Lay-up Site and Mooring Arrangements

The following portions of the lay-up arrangements are normally subject to approval of the local port authorities and the underwriters. However, they may be surveyed and included in the Bureau Lay-up report at the option of the unit's Owner.

#### *1.5.7(a) Lay-up Site Considerations*

- i)* Protection from open seas and surge.
- ii)* Sufficient year-round water depth.
- iii)* Good holding ground for anchors, clear of wrecks, cables or other bottom debris.

- iv) Clear of known cyclone or typhoon zones and tidal wave lee shore.
- v) Clear of open roadstead anchorages or shipping channels.
- vi) Clear of high-velocity or turbulent tidal currents.
- vii) Clear of significant amounts of moving ice
- viii) Clear of hazardous shore facilities.
- ix) Clear of detrimental industrial waste discharges.
- x) Freezing or excess humidity.
- xi) Suitable soil conditions for self-elevating units and submersible column stabilized units, considering type of support, such as spud cans or mats.

#### *1.5.7(b) Mooring Arrangements Considerations*

- i) Good holding ground, non-foul bottom, and ample anchor chain scope. “Ample” scope is generally considered to be seven times the depth of the water as a minimum.
- ii) Unless secured to a permanent mooring buoy, elevated or submerged in shallow water, the unit should preferably be moored to prevent rotating with wind or tide changes, stem or head toward the usual most severe of winds or currents. The chains should not be subjected to cross-contact or twisting or the anchors to tripping. For ship-type units, supplemental stern mooring or anchoring arrangements should normally be provided to the ship basic anchoring equipment. Where mooring by a single anchor is necessary, provisions must be made for periodically clearing the chain of twists.
- iii) The chains or mooring wire should be led and protected so as to avoid chafing against the unit. If the unit is subject to wave movement or surge, the chain should be regularly shifted in or out a short distance to move the point of wear. When initially paying out, the locking arrangement of each connecting link on the anchor chains should be verified.
- iv) Where ship or barge type units are moored in groups or as a part of a group, the following additional items should be considered:
  - a) The size and number of units or other vessels (i.e., total windage and current drag areas) of the group and the external forces to be expected should be compatible with the capacity of the mooring arrangements.
  - b) Adjacent units or vessels should be similar in size to avoid differential surging motion, and at similar freeboards to enable direct lead for breast lines.
  - c) Ship-type units should be moored in alternate directions bow to stern in even numbers in order to provide equal anchor holding power at both ends of the group and to prevent swinging. The fore-and-aft direction should be parallel to the usual most severe winds.
  - d) All unit-to-unit or unit-to-vessel (breast) mooring lines should be material of similar stretch characteristics.
- v) Ample size fenders or camels should be provided alongside at areas of possible or actual contact with other units, vessels, or fixed structures.
- vi) Day and night compass bearings and or line-up markers should be clearly established and regularly checked by the watch personnel for signs of the mooring shifting or anchor dragging.
- vii) Anchor lights, aircraft warning lights and fog signals should be in good order. Supplemental deck lighting should be used if near shipping lanes.

- viii)* A tug or supply vessel with pumping-out equipment and firefighting assistance should be available within reasonable distance and time.
- ix)* Ship- or barge-type units should be ballasted to reduce windage, rolling and surge, 30% or more of the load line draft is suggested, with due regard for similar freeboards where moored to other units or vessels. Hull stresses and salvage potential should also be established, clearly visible reference marks should be painted at bow and stern just above the waterline as external means of checking for leakage.
- x)* Column-stabilized semi-submersible units should be ballasted to a suitable draft, considering the environmental conditions at the lay-up site.
- xi)* Jack-up units should be elevated and ballasted for storm conditions.
- xii)* Emergency towing pendants should be secured to bitts at bow and stern of each unit and arranged for easy access from a tug.
- xiii)* Means should be provided for the watch personnel to release the anchors or moorings if necessary in an emergency. Anchors should be buoyed for locating. If steam-driven, the anchor windlass and any necessary mooring winches should be fitted with emergency air connections. If electric, an emergency source of power should be available for their operation.

### 3 Guide for Reactivation of Laid-up Mobile Offshore Drilling Units

For units returning to service from extended lay-up (six months or more), regardless of whether the Bureau has been informed that the unit has been in lay-up or lay-up preparations reviewed by the Bureau, a Reactivation Survey is required. A Bureau Office should be contacted for details of the requirements. Outlined below are guidelines on such surveys.

#### 3.1 Reactivation Survey Status

- i)* In order to restore a laid-up unit to active Class status, a Reactivation Survey is to be carried out including a corresponding point-by-point coverage of the original lay-up steps. The extent of the Reactivation Survey is generally dependent on the length of time in lay-up, the lay-up procedures followed, and the maintenance conditions during lay-up; however, the equivalent of an Annual Survey for all Class items, up-dating any due surveys, and compliance with any outstanding recommendations are normally required.
- ii)* The primary objective of the Reactivation Survey is to ensure that the unit is fit, within the scope of Classification, to transit to the drilling site and resume normal drilling operations. Where lay-up preparations and procedures were submitted to the Bureau for review and verified by survey at time of lay-up from the progression of survey intervals, or to modifying the requirements for up-dating surveys at time of reactivation.
- iii)* Applicable items of the Reactivation Survey may be credited to a forthcoming Special Survey, provided that the entire Special Survey is completed within a period of approximately twelve months, or the Special Survey is on continuous basis.

### 3.3 Hull and Outfit

#### 3.3.1 Drydocking Survey

Underwater Inspection by a diver may be permitted in lieu of Drydocking for reactivation of most units except for floating-type units where lay-up has been unduly extended. Cleaning of the unit's underwater body, including sea suctions, will normally be required to enable meaningful underwater examination. Where it is intended to proceed from the lay-up site to another location for completion of reactivation work, an underwater inspection by diver (for wet tow) will normally be required prior to departing lay-up site.

#### 3.3.2 Witnessing of Functional Testing or Verification of Fitness for Service

Witnessing of functional testing or verification of fitness for service of the following items should be normally included in the reactivation surveys of hull and outfit:

- i) Anchors and chain cables or mooring cable, chain stoppers, and chain locker pumping arrangements.
- ii) Anchor windlass, mooring winches, and roller fairleads.
- iii) Drill floor and machinery-space drain wells together with bilge pumping arrangements and hull penetrations.
- iv) Random ballast or preload tanks, pump rooms, ballast piping, and associated ballast control system and pumping arrangements.
- v) Watertight doors, machinery room skylights (where fitted), fire dampers, ventilators, portlights, hatch covers and their respective closing devices.
- vi) General examination of the mud and cement storage and mixing tank. Examination and random testing of the associated piping as deemed necessary by the attending Surveyor.
- vii) Internal examination of cofferdams and void spaces together with their pumping out arrangements.
- viii) Cleaning and flushing of potable water tanks.
- ix) General examination and testing of whistle, internal communications systems, engine-order telegraph, steering arrangements and controls (if applicable), alarm systems, rudder angle indicator and navigational or warning lights.
- x) Examination and servicing as necessary of radio installations, radio direction finder, gyro-compass and repeaters, magnetic compasses, depth sounder, radar, and other navigational aids.
- xi) Fire extinguishing arrangements.
- xii) Tank venting arrangements including closing devices, pressure-vacuum relief valves and flame arrestors.



### 3.5 Machinery and Drilling Equipment

- i)* Stack and ventilation covers to be removed or opened up.
- ii)* Boilers, heat exchangers, piping systems and other equipment to be drained and cleaned of preservatives or inhibitors, inspected and closed up in good order and afterwards tested under operating conditions.
- iii)* Engine lubricating oil, stern bearing oil, and steering system hydraulic fluids to be analyzed for contamination or chemical degradation and if found unserviceable, the system is to be drained, flushed, sterilized if bacterial deteriorations is present, and refilled with new oil or fluid of the proper grade.
- iv)* BOP stack control system, derrick skidding system, braking system, heave compensation and riser tensioning hydraulic fluids should be analyzed for contamination or chemical degradation and if found unserviceable, the system is to be drained, sterilized if bacterial deterioration is present, and refilled with new oil or fluid of the proper grade.  
  
If the system was drained at the time of lay-up, the preservatives should be flushed out and the system refilled with new fluid of the proper specification and air purged as necessary.
- v)* Thruster units, reduction and reverse gearing to be examined as accessible via inspection openings including lubrication arrangements. Gear casing and foundations to be examined and reversing and braking arrangements operationally tested as necessary.
- vi)* Thrust bearings, lineshaft bearings and their respective lubrication arrangements to be checked.
- vii)* Diesel engines and their accessory gear to be selectively opened out and examined for corrosion, excess wear, damage, proper tensioning and torque. Low-speed engine crankshaft deflections (drillships) to be taken and recorded. Protective trips and alarms are to be verified.
- viii)* All essential auxiliary machinery and equipment to be operationally tested and protective devices verified.
- ix)* All essential piping systems to be examined under pressure, checked for leaks, and over-pressure relieving arrangements verified. All connections to the sea and their respective valves and non-metallic expansion pieces to be examined.
- x)* All required fire extinguishing arrangements to be examined, including fire pumps, and operationally tested as necessary.
- xi)* The rotary assembly, top drive, leg and raw-water jacking machinery, derrick skidding gear, racks and pinions, should be re-lubricated, operationally tested and safety or protective devices verified.
- xii)* The condition of hazardous-areas doors and closures in boundary bulkheads should be checked.
- xiii)* The drilling and well-control equipment should be examined prior to re-installation, function tested as considered necessary and verified in proper working condition.

### 3.7 Electrical

- i)* Insulation resistance of all power and lighting circuits together with generators, motors and switchgear, to be tested, results evaluated and low-reading components dealt with as necessary.
- ii)* Generators to be tested under operating conditions, and switches, circuit breakers and electrical protective devices verified.
- iii)* Electrical lighting, electrical fixtures, and instrumentation in hazardous areas to be verified in satisfactory condition.



### **3.9 Tensioner System and Motion Compensator**

Tensioner system and heave compensators should be examined, trial actuated to full stroke, and re-conditioned as necessary.

### **3.11 Control and Instrumentation**

All essential control systems, monitoring instrumentation, limit alarms and emergency shut-offs to be verified in working order.

### **3.13 Trials**

In addition to the operational tests of individual units of machinery, for self propelled units, a dock trial and subsequent sea trial if deemed necessary or applicable, should be carried out to the satisfaction of the attending Surveyor.

### **3.15 Documentation and Certification**

- i)* The validity of the various statutory or operating documents such as the Register of Lifting Appliances, IMO MODU Code, MARPOL, Load Line and any applicable SOLAS Certificates should be checked and up-dated or renewal surveys carried out as necessary.
- ii)* Statutory certificates issued by this Bureau that are still valid at the time of the Reactivation Survey will require at least a general examination of the covered items to confirm continued validity.
- iii)* Possible changes or revisions in international convention requirements since the time of lay-up or in the interpretations of same by the registry Administration should be investigated.

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