

**Translation. Only the Danish version is authentic.**

*Danish Maritime Authority Technical Regulation no. 5 of 18 May 2000*

**Technical Regulation on the Construction and Equipment, etc.  
of Mobile Offshore Drilling Units  
(MODU Codes with Supplementary Provisions)<sup>1</sup>**

In pursuance of Section 1 (2), Sections 3-5, Section 17 (5), and Section 32 (4) of the Danish Safety at Sea Act no. 900 of 16 December 1998, and in pursuance of Section 1 (2), Sections 3-8, Section 11 (2), Section 12 (2), and Section 28 of the Danish Safety of Ships' Act no. 98 of 12 March 1980, as amended, and in consultation with the Minister for the Environment and Energy, the Faroese regional government and the Greenland Home Rule, and by authority of the Minister for Trade and Industry, the following is laid down:

*Application*

**Section 1.** This technical regulation shall apply to mobile offshore drilling units (MODUs).

*Subsection 2.* This technical regulation shall, however, not apply to mobile offshore drilling units operating in the area of the Danish continental shelf or in Danish territorial waters if they are carrying out operations in connection with the prospect for or extraction of oil and gas from the seabed, cf. the Act on certain offshore installations.

*Safety provisions*

**Section 2.** Mobile offshore drilling units shall comply with the provisions of the IMO Code for the Construction and Equipment of Mobile Offshore Drilling Units, as amended. When deciding what version of the MODU Codes and what amendments apply to a mobile drilling unit, reference is made to the provisions hereon in the codes and the amendments.

*Subsection 2.* Accommodation, etc. on mobile drilling units shall comply with the provisions hereon in Notice B from the Danish Maritime Authority, Chapter II-3, taking into consideration, however, the specific conditions prevailing on board such units.

*Subsection 3.* Furthermore, mobile offshore drilling units constructed after 1 June 2001 shall comply with the supplementary provisions stipulated in the annex to this technical regulation.

*Penalty clause, entry into force, etc.*

**Section 3.** Contraventions of the provisions of Section 2 shall be punished by fine, simple detention or imprisonment for a term not exceeding 1 year.

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1. *This technical regulation has been notified as a draft in accordance with European Parliament and Council Directive 98/34/EC (the directive on information procedures), as amended by Directive 98/48/EC.*

*Subsection 2.* The penalty may be increased to simple detention or imprisonment for a term not exceeding 2 years, if

- 1) the contravention has resulted in damage to health or provoked danger hereof,
- 2) previous injunctions or orders have been issued for the same or similar behaviour, or
- 3) the contravener or others have obtained or intended to obtain a financial benefit from the contravention.

*Subsection 3.* It shall be considered especially aggravating circumstances if damage has been caused to the life or health of young persons below the age of 18 or if danger of such damage has been provoked, cf. Subsection 2 (-1).

*Subsection 4.* If the financial benefit obtained by the contravention is not confiscated, special consideration shall be paid to the size of such an obtained or intended financial benefit when the fine, including additional fine, is fixed.

*Subsection 5.* Liability to punishment may be imposed on companies, etc. (juridical persons) according to the provisions of Chapter 5 of the Penal Code.

*Subsection 6.* In case the contravention is covered solely by the Danish Act on the Safety of Ships, etc., the penalty may only be a fine or simple detention.

**Section 4.** This technical regulation shall enter into force on 1 July 2000.

*The Danish Maritime Authority, 18 May 2000*  
Christian Breinholt / Peter Lauridsen

**Annex to Technical Regulation on the Construction and Equipment,  
etc. of Mobile Drilling Units  
(1989 MODU Code with Supplementary Provisions)**

*Introduction*

According to Section 2 of the technical regulation, mobile offshore drilling units constructed after the entry into force of the technical regulation shall comply with the provisions of the IMO Code for the Construction and Equipment of Mobile Offshore Drilling Units, as amended. Furthermore, such mobile offshore drilling units shall comply with the supplementary provisions stipulated in this annex.

The numbering of the annex refers to the numbering of the 1989 MODU Code.

Text given in ordinary printing type refers to the text as it appears in the 1989 MODU Code, whereas text given in italics refers to the supplementary national provisions. Where the MODU Code text is given, this has only been done to facilitate the comprehension of the supplementary text.

At the moment, the following amendments have been made to Resolution A.649(16) Code for the Construction and Equipment of Mobile Offshore Drilling Units (1989 MODU Code):

- MSC/Circ. 561 of 3 July 1991, "Amendments to the MODU Code", and
- Resolution MSC.38(63) of 19 May 1994 "Adoption of Amendments to the Code for the Construction and Equipment of Mobile Offshore Drilling Units, 1989".

Attention is drawn to the fact that, in addition to these provisions, the regulations on occupational health issued by the Danish Maritime Authority shall apply, including technical regulation no. 5 of 3 July 1997 on noise in ships, with remarks in Notices from the Danish Maritime Authority 4/98.

**Regulations and Principles for the Construction and Equipment  
of Mobile Offshore Drilling Units**

**Chapter 1 – General**

**1.5 Equivalentents**

1.5.1 Where the Code, *the technical regulation or this annex* requires that a particular fitting, material, appliance, apparatus, item of equipment or type thereof should be fitted or carried in a unit, *or that special requirements should be made as to the design and construction*, or that any particular provision should be made, or any procedure or arrangement should be complied with, the *inspecting authority* may allow any other fitting, material, appliance, apparatus, item of equipment or type thereof to be fitted or carried, *or that the unit is designed or constructed in accordance with another design*, or any other provision,

procedure or arrangement to be made in that unit, if *the inspecting authority* is satisfied by trial thereof or otherwise that such fitting, material, appliance, apparatus, item of equipment or type thereof, *or design and construction*, or that any particular provision, procedure or arrangement is at least as effective as that required by the Code.

*1.5.2 The Danish Maritime Authority shall approve tests carried out by independent, recognised test laboratories, including test laboratories in other EC and EEA member states that issue appropriate and satisfactory guarantees of a technical, professional and independent nature in the European Union.*

## **Chapter 2 – Construction, strength and materials**

### **2.1a Provisions on construction**

*2.1a.1 All drilling units shall in their entire design have the strength requisite for the intended purpose.*

*2.1a.2 All drilling units shall be classified by one of the recognised classification societies.<sup>2</sup>*

*2.1a.3 In addition to the requirements of this technical regulation, drilling units shall be designed, constructed and maintained in accordance with the rules issued by a classification society recognised by the Danish Maritime Authority in accordance with the provisions stipulated in the technical regulation of the Danish Maritime Authority on the approval and authorisation of organisations carrying out inspections and surveys of ships with a view to hull construction, strength, scantlings, anchors, chains, windlasses and tow lines, machinery, boilers and electrical installations, or comply with the national standards of the Danish Maritime Authority, which shall ensure an equivalent level of safety.*

*2.1a.4 For each unit concerned, information shall be submitted to the Danish Maritime Authority about the parts or fields that are, either wholly or partly, not covered by the rules and surveys of the class.*

## **Chapter 3 – Subdivision, stability and freeboard**

*In addition to the provisions of Chapter 3 of the MODU Code, mobile drilling units shall comply with the recommendations for mobile offshore drilling units (MODUs) in the Code on Intact Stability for All Types of Ships Covered by IMO Instruments (resolution A.749(18)), as amended.*

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<sup>2</sup>. Cf. technical regulation on the approval and authorisation of organisations carrying out inspections and surveys of ships issued by the Danish Maritime Authority.

## **Chapter 4 – Machinery installations for all types of units**

### **4.1 General**

*4.3.1.1 Self-propelled drilling units shall, with regard to machinery and electrical installations, in addition to the provisions of Chapters 4, 5 and 6, comply with the provisions in force of SOLAS 74, when relevant.*

*4.1.3.2 All engine spaces shall be sufficiently ventilated taking into account the application of the space. With a view to the personnel's safety and health as well as the operation of the engines, there shall, in category A engine spaces, be sufficient air supply to the spaces when the machinery or boilers in these spaces are operating at full power under all weather conditions, including rough weather.*

*4.1.3.3 To the extent necessary, strong and properly secured railings, base mouldings or the like shall be fitted. Floors and gratings shall be skid-proof and be made of steel or other non-combustible material.*

*4.1.3.4 It shall be ensured that all exhaust pipes and silencers are tight, shielded and insulated with non-combustible material to the extent necessary.*

*4.1.3.5 All exhaust pipes from machinery of the internal combustion type shall be separately led to the open air.*

*4.1.3.6 Engine spaces shall be well lit with electrical light and the installations shall be divided into at least two groups.*

### **4.4 Steam pipe systems**

*4.4.4 Steam pipes shall be insulated, covered by non-combustible material and shielded to the extent required to avoid accidents.*

### **4.13 Machinery installations for the operation of the lifting system for self-elevating units**

*4.13.1 Machinery installations for the operation of elevating systems shall be constructed in accordance with the rules of a recognised classification society.*

*4.13.2 The elevating system shall be so constructed that the position of the drilling unit can be maintained during a failure in the normal power supply to the elevating system or in case of total damage of any of the elevating units of each leg.*

*4.13.3 Hydraulically driven machinery for the operation of elevating systems shall be so constructed that loss of pressure in any hose or pipe because of damage to these shall not involve any safety risk in connection with the maintenance of control of the drilling unit.*

4.13.4 Hydraulic systems shall have at least two main pumps, each with a 100 per cent capacity and with separate electrical power supply from each part of a separate main switchboard.

4.13.5 The elevating system shall be so designed and constructed that it has the capacity of lifting and lowering the unit safely to the maximum lifting and lowering loads defined for the unit. In addition, the system shall be able to tolerate the forces imposed on it in the static condition from the maximum preload and storm loads defined for the unit.

#### **4.14 Control and alarm systems for elevating systems**

4.14.1 It shall be possible to manoeuvre and operate the elevating system from a central point, and furthermore it shall be possible to operate the elevating system for each leg locally if the drilling unit is provided with a clamping system.

4.14.2 At the central control station, an alarm system covering the elevating system shall be located.

4.14.3 At the central control station, there shall be instruments showing:

- .1 the total effect or power consumption when jacking.
- .2 the inclination of the drilling unit around two axes perpendicular on each other.

These instruments may be executed as one instrument showing a combination of the two values.

4.14.4 A communication system shall be available from where each leg can be locally operated to the central control station.

4.15.5 Visual and acoustic alarms shall be installed so that an alarm sounds when the system is not functioning within the limits defined.

### **Chapter 5 – Electrical installations for all types of units**

#### **Chapter 6 – Machinery and electrical installations in hazardous areas for all types of units**

##### **6.2 Classification of hazardous areas**

6.2.1 [After the MODU Code text, the following shall be added:] *When determining "areas of explosion hazards", the following factors shall be taken into consideration:*

- a. *Spillage and discharge areas.*
- b. *The amount and extent of the spillage or discharge.*
- c. *Ventilation.*

- d. *Properties of the combustible gases, vapours or liquids (temperature, flash point, density, concentration).*
- e. *Consequences.*
- f. *Special safety measures.*

**(In the MODU Code, guidelines for the extent of the zones under normal conditions are stipulated subsequently).**

#### **6.4 Ventilation of spaces**

6.4.4 *If mechanical ventilation is used to reclassify an area, arrangements shall be made to monitor pressure. Such arrangements shall, independent of each other, disengage electrical equipment that is not of the explosion-proof type and equivalent to the classification that would be applicable without ventilation. Disconnection shall be made in unclassified areas or by explosion-proof material. See, furthermore, the guidelines in IEC 61892-7, section 8.*

6.4.5 *Ventilation systems shall be constructed so that, both during operation and stoppage, air from classified areas is prevented from percolating into unclassified areas.*

#### **6.6 Electrical installations in hazardous areas**

6.6.2 (MODU Code text)

- .1 *Electrical equipment in hazardous areas shall be constructed, installed and maintained so that it will not give rise to ignition of flammable gases/air mixtures in and around the equipment.*
- .2 *Electrical equipment in hazardous areas shall be able to tolerate the environmental influences in the area.*
- .3 *Electrical equipment protected against explosion shall be constructed in accordance with the specifications and recommendations laid down by the IEC or other recognised standards. A recognised test laboratory shall certify the equipment as being suitable for the flammable gases/air mixtures that may occur.*
- .4 *All equipment protected against explosion shall be marked in accordance with the provisions on construction and shall be easily identifiable.*

6.6.4 (MODU Code text)

- .1 *Cables for intrinsically safe circuits shall not be conveyed together with other cables within or outside hazardous areas, cf. IEC 61892-7, section 7.9.7.*

### **Chapter 7 – Machinery and electrical installations for self-propelled units**

## **Chapter 8 – Periodically unattended machinery Spaces for all types of units**

### **8.3 Fire safety**

#### 8.3.9 (MODU Code text)

- .1 [After "or" in the MODU Code text, the following shall be inserted:] *the fire control station (if any) and in the office of the master of the unit; or*

### **8.4 Protection against flooding**

8.4.4 *The control devices for any valve serving a sea valve, an overboard cable below the waterline or a bilge ejector system shall be located so that there is sufficient time to operate them in the event of the space being flooded, taking account of the time assumed necessary to reach and operate these control devices. If the level of height to which the space might be flooded with the drilling unit in the fully loaded condition so requires, measures shall be taken to operate the control devices from a point above this level.*

8.4.5 *In periodically unattended engine spaces, it shall be possible to operate each individual sea connection from an easily accessible point above the engine floor or grating to which there is unimpeded access from above.*

*The floor or grating from where the operation of the valves shall be carried out shall be located at such a high level that the water, in the event of a pipe burst at the largest sea connection, will not reach that level within a period of 10 minutes from the moment when the flooding alarm or the alarm for drop of pressure in the system has sounded. The operating handles shall be provided with an easily visible indication showing whether the valve is open or closed. Where doubt may arise as to the question of whether the valves are located in a sufficient height above the tank top, it shall, by making an assessment of the flooding, be possible to prove that the requirement has been complied with.*

### **8.8 Specific requirements for machinery, boiler and electrical installations**

#### **8.10 Periodically unattended spaces for the propulsion machinery**

*Drilling units constructed to engage on voyages without any assistance from the outside and with periodically unattended machinery spaces provided with machinery for seaborne propulsion shall comply with the relevant provisions of SOLAS.*

## **Chapter 9 – Fire safety**

### **9.1 Structural fire protection**

*Windows leading to the drilling deck shall be executed as a type-approved class A-60 structure.*

9.1.8 [After the MODU Code text, the following shall be inserted:] *and it shall not be possible to secure them in the open position. Weather-tight doors that are not of the self-*

*closing type may be accepted as an equivalent to class A-0 doors. The doors shall be provided on both sides with the following text: "FIRE DOOR – MUST BE KEPT CLOSED".*

*9.1.9 All accommodation spaces shall be located outside of, and as far away as practicable from, areas of explosion hazards.*

## **9.2 Protection of accommodation spaces, service spaces and control stations**

9.2.1 All bulkheads required to be "A" or "B" class divisions (the remaining part of the MODU Code text is unaltered).

9.2.5 Except for insulation in refrigerated compartments, insulation material, pipe and vent duct lagging, ceilings, linings and bulkheads should be of non-combustible material. Insulation of pipe fittings for cold service systems and vapour barriers and adhesives used in conjunction with insulation *as well as insulation material for water pipes* need not be non-combustible ... [followed by the rest of the MODU Code text, including the note].

9.2.16 (MODU Code text)

- .2 a fire damper located in the lower end of the duct as well as a fire damper located in the upper end of the duct;*
- .5 means for operating fire dampers, stopping the intake ventilation and releasing the fire extinction installation shall be located in the same place and immediately outside the space, but sheltered from a fire; and*
- .6 at the point of release, clear instructions of how to operate the fire extinction arrangement shall be affixed.*

## **9.3 Means of escape**

9.3.2 Two means of escape should be provided from every machinery space of category A by one of the following:

- .1 (MODU Code text). The protected escape route shall be fire protected to class A-60 standard; or*
- .2 (MODU Code text)*
- .3 All ladders forming part of escape routes in category A machinery spaces shall be made of steel and shall be shielded on the lower side.*

*9.3.6 If there is no direct access to the open deck from a radio station, there shall be two escape routes from such a station. (This does not apply to the alternative radio station introduced by the 1991 amendments). One of these escape routes may be a porthole or a window of sufficient size or another approved arrangement.*

## **9.5 Fire-extinguishing systems in machinery spaces and in spaces containing fired processes**

### **9.5.5 High-pressure CO<sub>2</sub> installations**

- .1 The installation shall be so designed and constructed that operating valves, etc. are easily accessible and not easily cut off in case of fire.*
- .2 The installation shall be manually operated.*

#### **CO<sub>2</sub> spaces**

- .3 The space in which the CO<sub>2</sub> cylinders are stored shall have direct access to the open deck and may not be used for other purposes.*
- .4 The space shall be insulated, ventilated and arranged so that the temperature will not normally exceed 40 °C.*
- .5 Drains shall be led separately to the open deck or overboard.*
- .6 It shall be possible to operate all doors and hatches from both sides in a simple way.*
- .7 Communication shall be possible by ordinary telephones, portable radiotelephones, etc. between the wheelhouse or fire control stations and the release points of the installation.*
- .8 The CO<sub>2</sub> cylinders shall be solidly secured in an upright position and be so placed that the cylinder valves are easy to check. In addition, they shall be elevated above the floor and be protected against corrosion.*

#### **CO<sub>2</sub> cylinders**

- .8 The CO<sub>2</sub> cylinders shall comply with the Danish provisions on containers of the kind in question in force at any time. CO<sub>2</sub> cylinders of foreign origin may be permitted if they comply with the rules of a recognised classification society for such cylinders.*
- .9 Any cylinder or cylinder valve shall be provided with a burst disk which according to the manufacturer's guarantees secures the cylinder against harmful overpressure, and the arrangement shall permit free passage of gas from the cylinder in case the burst disk bursts.*
- .10 The tare and gross weight shall be stamped on the cylinders as well as the month and year of the latest pressure test and the test pressure.*

- .11 *The recharging companies are responsible for the degree to which the cylinders are recharged, which may not exceed 0.67 kg per litre cylinder capacity. The recharging companies shall issue certificates stating the degree to which the cylinders have been recharged.*
- .12 *If, in connection, with the control weighing or the control measuring of CO<sub>2</sub> cylinders, a weight reduction of or above 10 per cent is found in relation to the stamped on weight, the cylinder concerned shall be recharged.*
- .13 *The CO<sub>2</sub> cylinders shall be pressure tested every 20 years by a recognised test laboratory, a recognised classification society or by the chief engineer of the ship in question. In case more than 5 years have elapsed since the latest pressure test, a discharged cylinder may not be recharged until another pressure test has been carried out with a satisfactory result.*

#### **CO<sub>2</sub> pipes, etc.**

- .14 *All pipes outside engine and boiler spaces shall be galvanised on the inside as well as on the outside, and the fittings used shall be corrosion-proof.*
- .15 *Between cylinder valves and manifolds of CO<sub>2</sub> cylinders, only flexible high-pressure hoses shall be permitted.*
- .16 *The inside diameter of the connections of the CO<sub>2</sub> cylinders to manifolds shall be at least 10 mm.*
- .17 *Non-return valves shall be fitted between the single cylinders and the manifold in order that a cylinder may, if necessary, be removed from the battery without this being set out of operation. The non-return valve shall be securely fitted on the manifold.*
- .18 *CO<sub>2</sub> pipes, including manifolds, shall be made of seamless certificate pipes of steel. Only flanges for pressure level 10 N/mm<sup>2</sup> may be used. The manifold shall be fitted with a safety valve, the outlet pipe of which shall be led to the open air. The valve shall open at 13 N/mm<sup>2</sup> and be dimensioned so that it prevents harmful overpressure in the manifold. Outside diameters and wall thicknesses shall be in accordance with table 1. Derogation from wall thicknesses may be permitted for pipes made according to other standards.*
- .19 *Immediately after the main stop valve, there shall be a possibility of connecting a device for blowing through the CO<sub>2</sub> pipelines.*

<i>Manifolds, including pipes for main stop valve</i>	
<i>Diameter in mm Inside-outside</i>	<i>Wall thickness in mm</i>
<i>21.3-26.9</i>	<i>3.2</i>
<i>30-48.3</i>	<i>4.0</i>
<i>51.-60.3</i>	<i>4.5</i>
<i>63.5-76.1</i>	<i>5</i>
<i>82.5-88.9</i>	<i>5.6</i>
<i>101.6</i>	<i>6.3</i>
<i>108-114.3</i>	<i>114.3</i>
<i>127</i>	<i>8</i>
<i>133-139.7</i>	<i>8</i>
<i>152.4-168.3</i>	<i>8.8</i>

- .20 *To avoid freezing over, distributing valves for holds shall be of the rapid-opening type, and they shall be so marked that it is clearly indicated to what spaces the pipes lead.*
- .21 *All fittings used between cylinder valves and main stop valves/valve register shall be made of steel. Thread fittings may be used only in installations with up to 2 inches RG.*
- .22 *Main stop valves shall be made of steel or other equivalent approved material and designed to a working pressure of 10 N/mm<sup>2</sup>.*
- .23 *Derogation from wall thicknesses may be permitted for pipes made according to other standards.*
- .24 *All fittings used between main stop valves and/or between the valve register and discharge nozzles may be made of tough-hard metal or the like, and the joints shall be made so that there are no free threads.*
- .25 *Pipes from main stop valves/valve register to discharge nozzles shall, as a minimum, have a wall thickness as that stipulated in table II.*
- .26 *Pipes from CO<sub>2</sub> cylinders to valves shall, as a minimum, have an outside diameter and wall thickness as that stipulated in table I.*

<i>From main stop valves/valve register to discharge nozzles</i>	
<i>Diameter in mm Inside-outside</i>	<i>Wall thickness in mm</i>
21.3-26.9	2.6
30-48.3	3.2
51-60.3	3.6
63.5-76.1	3.6
82.5-88.9	4
101.6	4
108-114.3	4.5
127	4.5
133-139.7	5
152.4-168.3	5.6

- .27 *CO<sub>2</sub> pipes for "total flooding" installations to engine spaces shall be dimensioned according to the quantity of CO<sub>2</sub> that they are to carry. The permissible maximum quantity of CO<sub>2</sub> to be carried in the pipes may not exceed those stipulated in table III.*

<i>Table III</i>	
<i>CO<sub>2</sub> quantity</i>	<i>Inside pipe diameter</i>
45 kg	13 mm
100 kg	19 mm
135 kg	25 mm
275 kg	32 mm
450 kg	38 mm
1100 kg	50 mm
2000 kg	76 mm
3250 kg	89 mm
4750 kg	101 mm
6800 kg	114 mm
9500 kg	127 mm
15250 kg	152 mm

### ***Pressure test of pipes***

- .28 *The entire pipe system shall be pressure tested by hydraulic pressure. The test pressure between cylinder valves and the blind flange and between cylinder valves and valve register to holds shall be at least 19 N/mm<sup>2</sup>, and the test pressure in the rest of the pipe system shall be at least 2.5 N/mm<sup>2</sup>. Steering chains shall, however, be pressure tested to 1.3 x the working pressure.*
- .29 *The pressure test of manifolds, etc. mentioned in .1 above may be carried out before installation on board; in this case, however, the test certificate of the manufacturer shall be available.*
- .30 *When the pressure tests mentioned in .1 and .2 above have been carried out, a leakage test of the entire pipe system shall be carried out. The pressure shall be 1 N/mm<sup>2</sup> and the test may be carried out by the use of air.*

### ***Release of CO<sub>2</sub> installations***

- .31 If the CO<sub>2</sub> quantity exceeds 225 kg, a servo arrangement for the opening of cylinder valves and main stop valves shall be available for release of the cylinders. Tensile wires may not be used in such installations.*
- .32 A servo-operated release point for CO<sub>2</sub> shall, if located at the CO<sub>2</sub> space, be divided from this by bulkheads. The operating point shall be directly accessible from the open deck.*
- .33 The servo arrangement shall be so designed and constructed that any failure in the sequence of operations does not impede the discharge of the CO<sub>2</sub> quantity.*
- .34 It shall be possible locally to open and close main stop valves manually at full CO<sub>2</sub> pressure in the manifold. The valve shall be provided with an indication for the open and closed positions, and it shall be placed so that it is easily accessible.*
- .35 Where air and/or a hydraulic servo arrangement is used, an intermediate valve shall be placed on the pipeline between the starting cylinders and the servo cylinders, which can be operated from the point where the installation is released.*
- .36 If CO<sub>2</sub> is used for the operation of the servo installation, it shall not be possible to ventilate the installation to a closed space, e.g. the CO<sub>2</sub> space, unless the CO<sub>2</sub> quantity liberates a concentration of less than 3 per cent in the space concerned.*
- .37 Operating devices and all components related to servo equipment, including any power sources and wires, shall, with regard to the technical aspects of fire, be independent of the space or spaces protected by the installation.*
- .38 The installation shall be provided with a pneumatically activated and driven arrangement (time delay) ensuring that CO<sub>2</sub> is not released to a space until the CO<sub>2</sub> alarm has been activated for between 30 and 60 seconds. Such activation shall be independent of the activation required in 2.11. The arrangement shall be provided with by pass.*

### ***Alarm equipment, etc. for "total flooding" installations***

- .39 In a CO<sub>2</sub> protected space, there shall be an acoustic alarm transmitter, which shall be automatically activated before the first move of release has been made. It shall be possible to hear the alarm everywhere in the CO<sub>2</sub> protected space, at a maximum noise level in the space, and it shall not be possible to confuse the alarm for other alarm transmitters. Alarm devices shall be marked "CO<sub>2</sub>-ALARM".*

- .40 *Proper measures shall have been taken to prevent negligent handling of the alarm system. Such measures comprise, for example, marking and blocking in the open position of certain valves for propellant air to alarm transmitters, and special marking of electrical switches and fuses. It may not be possible to put the alarm system out of operation because of a fire in the CO<sub>2</sub> protected space, and electrical alarm systems shall be power supplied from the emergency power supply. Alarm signal systems driven by the escaping CO<sub>2</sub> cannot be approved as complying with the requirements for alarm signal systems in working spaces.*
- .41 *The main manifold shall be provided with a manometer and a pressure switch. The pressure switch shall be connected to the engine alarm installation or other appropriate alarm transmitter.*

### ***Testing of the installation***

- .42 *Tests of the completed installation shall be carried out to the satisfaction of the Danish Maritime Authority. Among other things, such tests shall comprise:*
- .1 *Leakage tests and pressure tests, provided that the latter have not been carried out at an earlier stage.*
- .2 *Checks of free passage by a blow-through of all pipes and nozzles.*
- .3 *The functioning of the alarm system.*
- .4 *The functioning of the operation devices, including release of the system up to the main stop valve, and then up to the blind flange (the "total flooding" test) mentioned in 2.13.1.*

### ***Special provisions***

- .43 *It shall be possible to protect the installation against unintended release when in shipyards, etc. by installing blind flanges (slide flanges) after the main stop valves.*
- .44 *CO<sub>2</sub> installations installed with the purpose of extinguishing fires in the machinery, e.g. fires caused by scavenging air in diesel engines, may be permitted at an appropriate point in the machinery space if the CO<sub>2</sub> concentration does not exceed 3 per cent in the space concerned.*

### ***Low-pressure CO<sub>2</sub> installations***

- .45 *With the exception of the section on CO<sub>2</sub> cylinders, the provisions on high-pressure CO<sub>2</sub> installations shall apply equivalently, though calculations on*

*pipes and nozzles shall be submitted to the Danish Maritime Authority in each individual case.*

- .46 Tanks for the storage of CO<sub>2</sub> shall, with a view to construction, material, scantlings and test pressure, comply with rules equivalent to those applied by a recognised classification society or a recognised authority. The tanks shall be marked in order that they can be identified, and the test pressure and date as well as working pressure, capacity and the inspector's identification mark shall be stamped on them.*
- .47 New CO<sub>2</sub> tanks shall be pressure tested before being installed on board. Hereafter, the tanks, including fittings, shall be inspected externally every 5 years. The pressure test and external inspection shall be carried out either by the Danish Maritime Authority or by a recognised classification society or by the chief engineer of the ship concerned. At the external inspections every 5 years, the tank insulation shall be removed only at places where it is assumed necessary in the relevant case. Pipes and valves at transfers between insulated and non-insulated areas (cold-conductors) and tank supports, flange sockets and valves shall be covered by the external inspection every 5 years. In addition, the chief engineer of the ship shall at least once a year carry out a thorough internal inspection of the tank supports, flange sockets and valves mentioned above. The result of such an inspection shall be entered into the ship's survey book stating the date and place.*
- .48 At least two safety valves shall be fitted directly on each tank. A three-way valve may be fitted between the safety valves and the tank if the valve is so designed that only one safety valve can be blocked at a time and that, notwithstanding the position of the valve, there is always free passage.*
- .49 The opening pressure of the safety valves may not exceed the permitted working pressure of the tank, and the area of passage of each valve shall be of such a capacity that the tanks are not exposed to overpressure even if both cooling components mentioned in 2.14.11 above fail.*
- .50 Discharge pipes from safety valves shall be led to the open deck, and the mouth of the pipe shall be so placed that CO<sub>2</sub> cannot escape into the interior of the ship. The area of passage of the pipe shall be at least twice the total area of passage of the valves.*
- .51 At least one pressure gauge shall be fitted on each tank, and it shall be possible to bar the pressure gauge from the tank.*
- .52 On each tank, an outside tube for measuring the level of the CO<sub>2</sub> liquid shall be fitted, and each tank shall have an automatically operating level control sounding an alarm at a minimum CO<sub>2</sub> content of 95 per cent.*

- .53 Measures to control the CO<sub>2</sub> quantity shall be so constructed that damage does not cause leakage.*
- .54 It shall be possible to bar all pipes that lead from the tank with the exception of the assembling branch for the safety valve by a closing device fitted directly on the tank.*
- .55 CO<sub>2</sub> low-pressure tanks shall have at least two cooling components that are mutually totally independent and have equal capacity and are provided with alarms for operational failure.*
- .56 Provisions shall be made for automatically operating alarms for CO<sub>2</sub> leakage in the tank space. The alarm shall be connected to the engine alarm system, and it shall be activated before the concentration has reached 3 per cent.*
- .57 It shall be possible to lock the main stop valve in the closed position.*

## **9.6 Portable fire extinguishers in accommodation, service and working spaces**

*9.6.1 Spare charges shall be available in accordance with the requirements of the Danish Maritime Authority.*

- .1 At least one spare charge shall be available for each prescribed fire extinguisher of types that can be recharged on board.*
- .2 As to fire extinguishers of types that cannot be recharged on board, at least one complete spare fire extinguisher shall be available for each prescribed four fire extinguishers or part thereof.*

*9.6.2 Fire extinguishers containing an extinguishing agent that, according to the inspecting authorities, either spontaneously or under the expected conditions of use, liberates toxic gases of such quantities that they present a danger to the persons on board may not be used.*

*9.6.3 A portable foam aggregate for use in connection with the fire line shall be composed of a foam ejector and an air foam jet pipe, which can be connected to the main fire line by means of a fire hose and a portable tank. The spray nozzle shall be capable of producing effective foam suitable for extinction of an oil fire at a speed of at least 1.5 m<sup>3</sup> per minute.*

*9.6.4 Fire extinguishers shall be subjected to periodic surveys and such tests as may be required by the Danish Maritime Authority.*

*9.6.5 One of the portable fire extinguishers for use in specific spaces shall be located in the vicinity of the entrance to the spaces involved.*

*9.6.7 Accommodation, service spaces and control stations shall be provided with portable fire extinguishers of an appropriate type and in sufficient numbers to the satisfaction of the Danish Maritime Authority.*

9.6.8 *Technical regulations on periodic surveys, etc. of fire extinguishers.*

### **9.6.9 General**

- .1 *Fire extinguishers and spare charges shall be permanently kept in order and be subjected to routine checks.*
- .2 *A suitable number of the portable fire extinguishers on board the ship, from both the accommodation and engine spaces, shall systematically be functionally tested in connection with fire drills.*
- .3 *The inspections prescribed in .2 and .3 above shall be carried out on board under the responsibility of the master, chief engineer or chiefmate of the ship in question on the condition that the manufacturer's service instruction for each individual type of fire extinguisher on board is followed. The pressure tests specified in 8.4 above may be carried out on board by the chief engineer of the ship involved on the condition that the person in question has acquired a certificate as chief engineer. If the above-mentioned inspections and pressure tests are not carried out on board, they shall be carried out in Denmark by recognised firms, persons or test laboratories. Abroad, the inspections and tests may be carried out by local, recognised firms.*

### **9.6.10 Four-monthly inspections of certain foam extinguishers**

- .1 *As to protein foam extinguishers with mixed foam charge that are located in engine spaces or in spaces where the normal temperature of the space exceeds 25 °C, the charge shall be renewed every 4 months by a new spare charge furnished with the supplier's date mark, which may not be older than 1 year. Spare charges shall be stored at a temperature below 15 °C.*

### **9.6.11 Annual inspections – all types of extinguishers**

#### **.1 CO<sub>2</sub> extinguishers**

*The extinguisher shall be control weighed in fully assembled condition. In case a reduction of more than 15 per cent of the weight of charge marked on the cylinder is demonstrated, the extinguisher shall be recharged.*

#### **.2 Nitrogen or CO<sub>2</sub> pressure charged powder extinguishers**

*It shall be checked that the manometer is capable of functioning.*

*In addition, it shall be checked that the manometer shows the correct driving pressure at normal temperature. If the driving pressure is below the normal level specified on the manometer, the extinguisher shall be recharged. In connection with the pressure tests prescribed in .4 above, the powder charge shall be replaced.*

**.3 Cartridge-operated powder, water and foam extinguishers**

- .3.1 Drive cartridges, etc. shall be dismantled and the charge shall be replaced by a new one. Foam charges shall, however, not be replaced if it can be distinctly demonstrated that the powder is "easy-flowing" and absolutely dry.*
- .3.2 The drive cartridge shall be cleaned and control weighed. If a reduction of above 10 per cent of the charge weight stamped on the cartridge is not shown, the cartridge may be reused. In connection with the periodic pressure tests prescribed in 8.4, the drive cartridge shall be replaced by a new one.*

**.4 Provisions applying to the extinguishers mentioned in .3.1, .3.2 and .3.3**

- .4.1 The container shall be inspected for external deformities and external corrosion. The container for the extinguishers mentioned in .3 shall also be inspected internally. If incipient corrosion is found, this shall be removed and the container shall be repainted. If serious external deformities and/or serious external corrosion are found, the container shall be either scrapped or pressure tested and inspected internally in accordance with 8.4 with a satisfactory result.*
- .4.2 Valves and hoses, etc. shall be undamaged. Any damaged parts shall be replaced. It shall be thoroughly checked that there is free passage. In connection with any replacement of damaged parts, the following shall apply:
  - .1 Joints shall be made of oil-, weather- and age-resistant rubber of good quality or of another material with similar properties,*
  - .2 Hoses shall have an adequate length, and they shall be made of oil-, weather- and age-resistant rubber of good quality or of another material with similar properties.*
  - .3 Hoses with associated fittings for CO<sub>2</sub> extinguishers shall be capable of tolerating a test pressure of 25 N/mm<sup>2</sup> and for other types of extinguishers twice the working pressure.**
- .4.3 It shall be ascertained that the instruction for operating the extinguisher is undamaged and easily legible. If not, the instruction shall be replaced.*
- .4.4 The inspection shall be completed by sealing off the operating handle of the extinguisher and providing the extinguisher with a durable control label stipulating:*

- .1 *the month and year of the latest annual survey,*
- .2 *the name and address of the person or firm, cf. 1.3, which has carried out the survey.*

#### **9.6.12 Periodic pressure tests, etc.**

##### **.1 CO<sub>2</sub> extinguishers**

- .1.1 *Containers for CO<sub>2</sub> extinguishers shall be cleaned, inspected internally and pressure tested every 10 years. The test pressure shall be 20N/mm<sup>2</sup> or 25N/mm<sup>2</sup>, dependent on the test pressure stamped on the container.*
- .1.2 *If 5 years have elapsed since the latest pressure test, a discharged CO<sub>2</sub> extinguisher may not be recharged until another pressure test has been carried out with a satisfactory result.*

##### **.2 Nitrogen or CO<sub>2</sub> pressure charged extinguishers**

- .2.1 *Containers for pressure charged extinguishers shall be cleaned, inspected internally and pressure tested every 10 years. The test pressure shall be 1.5 x the pressure of admission, however, not below 1 N/mm<sup>2</sup>, cf. the test pressure stamped on the container.*
- .2.2 *If more than 5 years have elapsed since the latest pressure test, a pressure charged extinguisher may not be recharged until another pressure test has been carried out with a satisfactory result.*

##### **.3 Cartridge-driven powder, water and foam extinguishers**

- .3.1 *Containers for extinguishers with propellant cartridges shall be cleaned, inspected internally and pressure tested every 5 years. The test pressure shall be 1.5 x the working pressure, however, not below 1 N/mm<sup>2</sup>, cf. the pressure test stamped on the container.*

##### **.4 Common provisions applying to the extinguishers mentioned in .1, .2, and .3**

- .4.1 *All pressure tests shall be carried out with hydraulic pressure, and it shall be thoroughly ascertained that the container is totally filled with liquid. The test pressure shall be kept constant for at least 15 seconds, and the containers may not show signs of leakage or permanent transformations. After the pressure test, the container shall be carefully dried up.*
- .4.2 *The month and year of the pressure test shall be marked durably on the container.*

## 9.9 Firemen's outfits

9.9.1 At least six firemen's outfits' complying with the requirements of regulation II-2/17.1 and 17.2 and two sets of personal equipment<sup>3</sup>, each set comprising the items stipulated in regulation II-2/17.1.1.1, 17.1.1.2 and 17.1.1.3 of the 1974 SOLAS Convention shall be provided.

- .3 *The quantity of spare air for breathing apparatuses on cargo ships shall be in compliance with the provisions of either .3.1 or .3.2:*
  - .3.1 *For each breathing apparatus, filled-up spare containers shall be available totalling at least 3600 litres air measured at atmospheric pressure, or*
  - .3.2 *for each breathing apparatus, filled-up spare containers shall be available totalling at least 1200 litres air measured at atmospheric pressure, and, furthermore, for recharging all spare containers on board, an approved high-pressure compressor shall be available independently powered or driven by the emergency power supply of the ship.*
- .4 *The quantity and arrangement of spare air for breathing apparatuses on passenger ships shall be in compliance with the provisions of .4.1 to .4.3.*
  - .4.1 *At least 3600 litres spare air distributed on three air cylinders for each required fireman's outfit and an approved air compressor for the recharging of cylinders with a capacity of 3600 litres per hour per fireman's outfit shall be available. The capacity need not, however, exceed 25000 litres air per hour.*
  - .4.2 *The air compressor shall be power supplied from the emergency supply or be independently diesel-powered, or be so constructed or equipped that the air cylinders may be used immediately after the recharging.*
  - .4.3 *The air compressor shall be suitably located on the upper deck of the ship.*
- .5 *Cylinders with a working pressure of up to 30 N/mm<sup>2</sup> may be used.*
- .6 *For new and existing ships, breathing apparatuses and smoke helmets shall be inspected according to the manufacturer's instructions. The inspection may be carried out either by the master, chief engineer or chiefmate of the ship or the manufacturer or his representatives.*

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3. With regard to "personal equipment", the following regulation on axes applies: An axe considered satisfactory to the Administration is an axe weighing about 2.5 kg and provided with a butt spike and a solid stick of high strength and of a length of about 60 cm.

## **9.11 Provisions for helicopter facilities**

9.11.1 [After the MODU Code text, the following shall be inserted:] *As an alternative to the "A-0" requirement, an air space of at least 1 meter between the top of the deck house and the lower side of the helicopter deck may be accepted. The top of deckhouses located immediately under helicopter decks may not have any openings. The deck shall be provided with means to avoid accumulation of liquids on the helicopter deck and to prevent such liquids from being spread to or falling down onto other parts of the unit.*

9.11.15 *Provisions on the tanking of aircraft are stipulated in Provisions for Civic Air Navigation, BL 3-6 Tanking of Aircraft, etc.*

## **Chapter 10 – Life-saving appliances and equipment**

### **10.3 Survival craft muster and embarkation arrangements**

10.3.7 (MODU text)

- .1 Provisions shall be made for landings (resting platforms) to ensure proper embarkation, or where specific structural circumstances render the setting up of landings impossible, other suitable arrangements shall be made to ensure secure embarkation.*
- .2 Landings shall be provided with effective lighting. The water surface close to landings shall be effectively lit as well. It shall be possible to deliver power supply for such lighting from the electrical emergency power supply.*

10.3.8 If fixed ladders cannot be installed, alternative means of escape with sufficient capacity to permit all persons on board to descend safely to the waterline, *within a maximum of 10 minutes from the moment when the starting signal has been given*, should be provided.

### **10.4 Survival craft launching stations**

Launching stations should be in such positions as to ensure safe launching having particular regard to clearance from any exposed propeller *and heavily projecting parts of the hull as well as the subjacent structure*. As far as possible, launching stations should be located so that survival craft can be launched down a straight side of the unit, except for:

- .1 survival craft or life rafts specially designed for free-fall launching; and*
- .2 survival craft or life rafts mounted on projections intended to provide clearance from lower structures of the drilling unit.*

### **10.5 Stowage of survival craft**

10.5.1 (MODU text)

- .2 as near the water surface as is safe and practicable. *A survival craft or lowerable life raft shall be so positioned that the survival craft or raft is upon embarkation at least 2 metres above the water line when the unit is in damaged condition, as described in chapter 3, or has reached the angle of heel at which the edge of the weather deck of the drilling unit is in the water surface, according to what is less.*

## **10.6 Survival craft launching and recovery arrangements**

### 10.6.1 (MODU text)

- .1 *Special consideration shall be taken to ensure that in case of emergency the survival craft or raft is clear of subjacent structures, etc.*
- .2 *The recovery arrangement of each survival craft shall be provided with a device ensuring that the craft can be heaved on to the unit carrying a minimum of six persons.*

10.6.13 Notwithstanding the requirements of regulation III/48.2.6, the speed of lowering need not be greater than 1 m/s. *The maximum speed of lowering may not exceed 1.5 m/s for rescue boats, 1.3 m/s for survival craft and 1.0 m/s for life rafts.*

## **10.9 Rescue boat embarkation, launching and recovery arrangements**

10.9.2 Launching arrangements should comply with 10.6. *It shall, however, be possible to launch the rescue boat when the unit is moving in smooth water at a speed of up to 5 knots, if necessary by means of painters.*

## **10.10 Lifejackets**

10.10.1 (MODU text). *The number of spare lifejackets for persons on duty shall comprise at least 50 per cent of the number of persons on board.*

## **10.11 Immersion suits**

10.11.1 (MODU text). *At least three immersion suits suitable for the crew of the rescue boat shall be located in the immediate vicinity of this boat.*

## **10.12 Lifebouys**

10.12.3 (MODU Code text). *For self-elevating drilling units, consideration shall be taken of the maximum height above the water line, and for other drilling units the lightest condition. The lifeline shall be so stowed that it can easily and unimpededly run out.*

## **10.16 Emergency warnings**

*10.16.3 The main alarm system and the loudspeaker system (public address system) shall comply with the provisions of SOLAS, Chapter III, Regulations 6.4 and 6.5, and the provisions hereon in the IMO Code of Alarm and Indicators.*

### **10.16.3.2 Internal system of communication**

- .1 The drilling unit shall be provided with an internal two-way communication system connected to muster stations, means of escape, control stations, the bridge, the radio centre, mess rooms, recreational spaces, offices, engine spaces, the crane driver house(s), etc. as well as permanent working spaces. As to muster stations and means of escape, the internal two-way communication system may be replaced by portable radio equipment.*
- .2 It shall be possible to transmit information via loudspeakers, according to the principle of choice or mass transmittance, to control stations, permanent working spaces and the entire accommodation.*
- .3 Where an integrated communication and alarm system has been installed, two independent amplifying circuits shall be available with an automatic connection switch in the case of failure in one of the circuits. It shall be indicated to which circuit the system is at present connected, and whether the other circuit is intact. The power supply shall function as prescribed in 8.7. Each amplifier shall have sufficient capacity to operate the entire loudspeaker system. Circuits for the loudspeakers shall be so designed that satisfactory alarm is transmitted to all places from at least two independent circuits. Each circuit shall be protected against failure in the earth system and short circuit. The functioning of the alarm shall have higher priority than the functioning of the communication system.*

## **10.18 Operational readiness, maintenance and inspections**

### **Weekly Inspections**

#### **10.18.6 (MODU text)**

- .2 all engines in lifeboats and rescue boats should be run ahead and astern for a total period of not less than 3 minutes, on the condition that the ambient temperature is above the minimum temperature necessary to start the engine.*

## **Chapter 12 – Lifting devices**

### **12.1 Cranes**

12.1.1 Each crane, including its supporting structure, which is used for the transfer of material, equipment or personnel between the unit and attending vessels, should be of a design

and construction to the satisfaction of the Administration and adequate for the service intended in accordance with the requirements<sup>4</sup> of a recognised classification society or with national or international standards or codes.

## **12.2 Personnel lifts**

12.2.1 Personnel lifts should be of a design acceptable to the *inspecting authority*<sup>5</sup> and adequate for the service intended.

## **Chapter 14 – Operating requirements**

### ***Supplementary Provisions***

#### **14.3 Pollution prevention**

*Mobile drilling units shall comply with the provisions on pollution prevention in Notice B from the Danish Maritime Authority, Chapter XX to XXIV.*

#### **14.6 Diving systems**

14.6.2 Diving systems should be designed, constructed, maintained and certified in accordance with a national or international standard or code acceptable to the *inspecting authority*, such as the Code of Safety for Diving Systems (resolution A.831(19), which may be employed for fixed diving systems, if provided. *In addition, the Diving Act and the administrative regulations issued under the act shall be complied with.*

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4. *Lifting devices shall comply with the technical regulation of the Danish Maritime Authority on lifting devices in ships.*

5. *Acceptable to the inspecting authority means that the lifts with regard to construction and safety comply with the standards of ISO-standard 8383 (specific requirements for lifts in ships) and DS/EN 81-1 (safety regulations for the construction and installation of personnel lifts and service lifts).*