

Regulations of 11 April 2003 No. 480 on welding equipment, etc. for the welding gases acetylene and oxygen in mobile offshore units

Legal basis: Laid down by the Norwegian Maritime Authority on 11 April 2003 under the Act of 9 June 1903 No. 7 relating to public control of the seaworthiness of ships etc. Legal basis amended to Act of 16 February 2007 No. 9 relating to ship safety and security (Ship Safety and Security Act) sections 7, 9, 11, 13, 16, 21, 28a, 41, 43, 45 and 47, cf. Formal Delegation of 16 February 2007 No. 171, Formal Delegation of 31 May 2007 No. 590 and Formal Delegation of 19 August 2013 No. 1002.

EEA references: EEA Agreement Annex II Chapter XIX point 1 (Directive 98/34/EC).

Amendments: Amended by Regulations of 29 June 2007 No. 1006, 18 January 2011 No. 56, 19 August 2013 No. 1036, 5 July 2016 No. 897.

Section 1

Scope of application

- (1) These Regulations shall apply to offshore units which either are entered or are to be entered in a Norwegian ship register.
- (2) Offshore units entered in a Norwegian ship register may, until the next certificate issue, comply with the requirements in force at the time of the latest certificate issue.

Section 2

Definitions

For the purpose of these Regulations, the following definitions shall apply:

- a) *Acetylene:* C₂H₂ for storage in special gas cylinders (15 to 19 bar at 15°C).
- b) *Recognized classification society:* Any classification society with which the Ministry has entered into an agreement pursuant to section 41 of the Ship Safety and Security Act:
 1. American Bureau of Shipping (ABS)
 2. Bureau Veritas (BV)
 3. DNV GL
 4. Lloyd's Register of Shipping (LR)
 5. Nippon Kaiji Kyoaki (Class NK)
 6. Rina Services S.p.A (RINA).
- c) *Recognized standard:* Standard issued by NS/BS/API/DIN/NFPA/ISO/CEN/IEC or any other standard or body of rules, as appropriate, which is recognized nationally and/or internationally for a particular sphere of application. The Norwegian Maritime Authority may in each individual case decide which standard is considered to be recognized.
- d) *Mobile offshore unit:* A mobile platform, including drillship, equipped for drilling for subsea petroleum deposits, or a mobile platform used for other purposes than drilling for subsea petroleum deposits.
- e) *Competent person:* Person with qualifications to install, test and check a central plant and issue an Installation Certificate, cf. section 7.
- f) *MOU classification society:* A recognized classification society with which there is an additional agreement on its carrying out inspections and surveys, etc. on mobile offshore units. The following societies are MOU classification societies:
 1. American Bureau of Shipping (ABS)
 2. DNV GL
 3. Lloyd's Register of Shipping (LR).
- g) *Oxygen:* O₂ for storage in special gas cylinders (150 or 200 bar at 15°C).
- h) *Company:* Cf. the definition given in section 4 of the Ship Safety and Security Act.

Amended by Regulations of 29 June 2007 No. 1006 (in force on 1 July 2007), 18 January 2011 No. 56, 5 July 2016 No. 897.

Section 3

Duties

The company, employer, offshore installation manager and others who have their work on board shall perform their duties in accordance with the Ship Safety and Security Act and the supplementary provisions laid down in these Regulations.

Amended by Regulations of 29 June 2007 No. 1006 (in force on 1 July 2007), 19 August 2013 No. 1036 (in force on 20 August 2013).

Section 4

Mutual acceptance

- (1) Where these Regulations require that specific fittings, materials, equipment or devices, or types of equipment, etc. shall be acquired or be found in an offshore unit or a particular measure shall be taken or specific requirements apply to its design or construction, the Norwegian Maritime Authority shall permit the arrangement or fitting of other

appurtenances, materials, devices or apparatus, or types of such, or that other measures are taken in the offshore unit, or that the offshore unit is constructed or designed in another way.

(2) The prerequisite for such Norwegian Maritime Authority acceptance is as follows: It must be documented by testing or otherwise that any appurtenances, materials, pieces of equipment or devices, or types of such, or the arrangement, design or construction are at least as effective as those prescribed by the Regulations.

(3) The Norwegian Maritime Authority shall accept the results of tests performed at recognized testing institutions, including testing institutions in other EEA countries. This acceptance shall be subject to the tests yielding appropriate and satisfactory results of a technical, professional and independent nature.

Section 5

Exemptions

The Norwegian Maritime Authority may, on the basis of any proposal for an equivalent solution or upon a safety assessment, grant an exemption from the requirements of these Regulations upon application from the company. If the requirements of the coastal state and the requirement contained in these Regulations are irreconcilable, the Norwegian Maritime Authority may grant exemptions from the requirements of these Regulations insofar as safety is not jeopardized. Exemptions can only be granted when they do not contravene international agreements to which Norway has acceded.

Section 6

Documentation

The company shall be able to document that the requirements of these Regulations are complied with. Documentation shall be sent to the Norwegian Maritime Authority on request. The contents, scope and type of documents and the time of submission shall be decided by the Norwegian Maritime Authority.

Amended by Regulation of 29 June 2007 No. 1006 (in force on 1 July 2007)

Section 7

Competent person

The competent person shall:

- a) possess all necessary qualifications for the installation of piping and equipment in mobile offshore units,
- b) have special knowledge about the problems and safety precautions associated with installing, testing, checking and using central plants and practical experience in this area, and
- c) use, during the installation, the accessories, drawings and directions of the equipment vendor.

Section 8

Central plant

(1) Central plants shall be installed where the number of gas cylinders on board containing acetylene and/or oxygen exceeds 4. This requirement applies regardless of cylinder size.

(2) Central plants shall consist of a gas cylinder central fitted with a non-return valve for each gas cylinder, high-pressure hoses, manifold, stop valves, regulators, and pipes with outlet stations. All parts of the plant shall comply with the provisions of these Regulations.

(3) Any plant with permanently fitted pipes for acetylene and oxygen shall be considered a central plant, even if the number of gas cylinders is 4 or lower. All parts of such plants shall also comply with the provisions of these Regulations.

Section 9

Gas cylinder central

(1) In deciding the location and protection of gas cylinder centrals, consideration shall be given to possible fire and explosion hazards in adjacent spaces. An assessment shall be made of the consequences of an explosion in the gas cylinder central itself for the offshore unit's structural integrity and areas where personnel are normally found.

(2) The gas cylinder central shall be a separate room for the storage and connection of acetylene and oxygen cylinders. The room shall have a bulkhead, deck and ceiling made of steel and be gas-tightly separated from adjacent spaces. The gas cylinder central shall have direct access to the open deck.

(3) The gas cylinder central shall be so insulated, ventilated and arranged that the temperature will not normally exceed 40°C. Where the location of the room and the temperature allow, natural ventilation may be used. Materials used in connection with insulation, etc. shall be of an incombustible type. The ventilation arrangement shall not be connected to other ventilation systems on board. In addition, the room shall be ventilated in such a way that there is no risk of gas accumulation. Safety valves and similar devices shall have a vent point in a safe place on the open deck, see section 11 first paragraph (c).

- (4) The room shall not be used for other purposes than gas cylinder storage. Pipelines for combustible liquids and gases shall not penetrate the gas cylinder central.
- (5) When the total number of acetylene and oxygen cylinders (regardless of size) including spare cylinders does not exceed 8, both gases may be kept in the same room.
- (6) When the total number of acetylene and oxygen cylinders (regardless of size) including spare cylinders exceeds 8, the gas cylinder central shall consist of two gas-tight separated rooms, one for acetylene and the other for oxygen.
- (7) Gas cylinder centrals shall be clearly marked with signs showing that oxygen and acetylene cylinders are stored there. The text of the sign shall be as prescribed by section 16 first paragraph.
- (8) Electrical installations shall satisfy the regulations in force at any time on the installation of electrical components in spaces with a gas hazard.
- (9) In mobile offshore units not used for exploration for or exploitation (production) or storage of petroleum products, open gas cylinder centrals may be accepted if there is an appropriate and reasonable explanation for such an arrangement. For such installations, the following provisions shall apply:
 - a) Gas cylinders in a central shall be placed in separate and solid racks within a marked zone on the open deck. The gas cylinders, accessories and piping, etc. shall be effectively protected against mechanical damage, direct sunlight, and weather and wind exposure. The central shall be protected by a tight and solid roof or a steel cover, a solid mesh/grille or similar protection which can be easily opened or removed.
 - b) There shall be a marked division between the acetylene and oxygen bottles of the gas cylinder central.
 - c) Pipelines on the open deck shall have a wall thickness of at least 2.5 mm.

Section 10

Gas cylinders, accessories, etc.

- (1) Gas cylinders for acetylene and oxygen shall be of types certified by a recognized classification society or public authority. Cylinders of greater volume than 50 litres are not permitted.
- (2) Gas cylinders, including spare cylinders, shall be placed in erect position and securely fastened. The fastening arrangement shall be so designed that a rapid disconnection of cylinders may be carried out.
- (3) Storage of acetylene and oxygen cylinders in the engine-room is not permitted.
- (4) Burners, stop valves, regulators, non-return devices, high-pressure pipes and other accessories in connection with the welding equipment shall be of makes that comply with relevant standards, cf. section 12.
- (5) When the central plant is not in use the gas cylinder valves and the other valves shall be kept closed.

Section 11

Piping installations, etc.

- (1) High-pressure side. Piping and accessories between gas cylinders and regulator.
 - a) Acetylene pipes.
 1. Pipes shall be of stainless steel. All pipes shall be seamless. Piping and accessories shall have a 300-bar certificate.
 2. Copper or copper alloys containing more than 65% of copper shall not be used in connection with acetylene.
 3. In central plants where two or more cylinders of acetylene are connected to a manifold, the supply pipes between the cylinders and the manifold shall be fitted with non-return valves that comply with relevant standards, cf. section 12.
 - b) Oxygen pipes.
 1. Pipes shall be of stainless steel. All pipes shall be seamless. Piping and accessories shall have a 300-bar certificate.
 2. In central plants where two or more cylinders of oxygen are connected to a manifold, the supply pipes between the cylinders and the manifold shall be fitted with non-return valves that comply with relevant standards, cf. section 12.
 - c) Safety valves and similar devices.

Safety valves and similar devices fitted in a gas cylinder central shall have a vent point on the open deck. The vent point shall be in a safe place at a height of minimum 3 metres above deck. The location of the vent point shall be marked as prescribed by section 16 fourth paragraph.

See also section 9 third paragraph.
- (2) Low-pressure side.
 - a) Pipes shall be seamless, made of ST 35 material or equivalent material with a wall thickness of minimum 2.0 mm and/or in conformity with the requirements of a recognized classification society. Pipes on the open deck shall have a thickness of at least 2.5 mm.
 - b) Pipelines shall be laid freely and be so arranged that they are protected against damage. They shall not penetrate unventilated rooms, lockers, etc. or be laid in crew or passenger accommodation.
 - c) Expansion loops shall be placed where necessary and piping that penetrates a deck or bulkhead shall be sheathed in protection tubes of hard plastics or fibre material. All pipes shall be securely fastened so as to be protected against damage. The distance between fastening clamps shall not exceed 2.5 metres.

- d) Pipelines shall be laid with as few joints as possible. Joints shall be expertly welded with a TIG or acetylene/oxygen unit. Joints shall be fitted in places readily accessible for inspection.
 - e) Disconnectable couplings are not accepted as a substitute for welded joints.
- (3) Outlet stations.
- a) An outlet station is a bracket with stop valves, regulators, manometer, and non-return devices for acetylene and oxygen located in a cabinet or otherwise satisfactorily protected.
 - b) Outlet stations shall be located in a well-ventilated place and in such a way as to be protected against mechanical load.
 - c) The stop valves of outlet stations shall be closed when the system is not in use.

Section 12

Requirements for equipment and installations

Equipment and installations shall conform to the following standards:

- a) NS-EN 730 Gas welding equipment. Equipment used in gas welding, cutting and allied processes, safety devices for fuel gases and oxygen or compressed air. General specifications, requirements and tests.
- b) NS-EN 961 Gas welding equipment. Manifold regulators used in welding, cutting and allied processes up to 200 bar.
- c) NS-EN ISO 14113 Gas welding equipment. Rubber and plastic hoses assemblies for compressed or liquefied gases up to a maximum design pressure of 450 bar (ISO 14113:1997).
- d) NS-EN ISO 2503 Gas welding equipment. Pressure regulators for gas cylinders used in welding, cutting and allied processes up to 300 bar (ISO 2503:1998).
- e) NS-ISO 9090 Gas tightness of equipment for gas welding and allied processes (=29090:1992).
- f) NS-ISO 9539 Materials for equipment used in gas welding, cutting and allied processes (= EN 29539:1992).
- g) EN ISO 14114 Gas welding equipment. Acetylene manifold systems for welding, cutting and allied processes. General requirements (ISO/DIS 14114:1997).

Section 13

Installation, testing and checks of central plants

(1) Installation of a central plant.

Prior to the installation of acetylene and oxygen pipelines, piping as well as connections shall be thoroughly cleansed to remove all grease, oil and other combustible substances. No combustible or organic solvent may be used for this purpose. After the degreasing, pipelines and connections shall be blown clean with fat-free nitrogen, both prior to and after the installation. Compressed air from an oil-lubricated compressor or oxygen shall not be used.

(2) Blow-through and non-leakage testing after the installation, etc.

- a) After completed installation or repairs of the central plant and otherwise at 5 year intervals, cf. section 14, all pipelines shall be blown through and be non-leakage tested. The testing shall be carried out by a competent person.
- b) Blow-through of acetylene and oxygen piping shall be carried out with fat-free nitrogen. Nitrogen shall be blown in from the high-pressure side and be carried off at the outlet station. The outlet station(s) shall be removed during the blow-through process. At blow-through, the pressure shall be gradually increased to approximately 12 bar and the blow-through process shall continue till dirt no longer escapes from the pipe. High-pressure pipes shall be blown through separately.
 - 1. Low-pressure side
Fat-free nitrogen shall be used for non-leakage testing of acetylene and oxygen piping and the test pressure shall be 12 bar. After 8 hours, the pressure drop shall not exceed 0.4 bar.
 - 2. High-pressure side.
Acetylene piping shall be non-leakage tested with fat-free nitrogen at 25 bar. Oxygen piping shall be non-leakage tested with 200 bar oxygen or fat-free nitrogen.
 - 3. Common provision.
As part of the non-leakage test, all valves, joints and other connections shall be checked for leakage by appropriate means.

(3) Annual checks.

Non-leakage tests of piping shall be performed at least once a year using the ordinary operating pressures for oxygen and acetylene respectively. The gas supply to the pipelines is stopped by the central regulator being closed and the pressure in the pipelines shall then remain constant for at least 8 hours. If pressure drop should occur in oxygen and/or acetylene pipelines the central plant shall be checked and repaired by a competent person and a new Installation Certificate shall be issued. The annual test shall be entered on the Installation Certificate in the gas cylinder central.

Section 14

Installation Certificate

- (1) After a central plant has been installed, tested and checked by a competent person, an Installation Certificate shall be issued by a competent person. The person who issues the Installation Certificate shall sign it to certify that the plant is checked and tested as prescribed and that the plant also complies with the other provisions of these Regulations.
- (2) The Installation Certificate shall be issued for a period of maximum 5 years. The certificate is invalidated if the plant is altered or has suffered such damage as may affect its functionality or safety.
- (3) Before the 5 year period expires, the plant shall be re-tested and re-inspected by a competent person and a new Installation Certificate shall be issued. A recognized MOU classification society may issue the certificate when the shipping company and the classification society concerned have jointly inspected the plant. The Installation Certificate shall be clearly marked: «Renewal of Installation Certificate».
- (4) Following damage, alterations or renewals affecting important parts of the plant, it shall be re-tested and re-inspected by a competent person and a new Installation Certificate shall be issued. The Installation Certificate shall be clearly marked: «Renewal of Installation Certificate».
- (5) The Installation Certificate (original) shall be posted in the gas cylinder central and be so framed as to allow it to be removed for entries of annual checks.
- (6) A copy of the Installation Certificate shall be kept for at least 6 years by the person who issued it and the shipping company.

Section 15

Portable welding equipment

- (1) Portable welding equipment consists of 1 cylinder for oxygen and acetylene respectively, regulators, non-return devices, hoses, burners, etc. placed in a suitable portable appliance. The volume of the cylinders shall not exceed 50 litres.
- (2) In mobile offshore units provided with a central plant, portable welding equipment shall, when not in use, be stored in a rack in the gas cylinder central. The total number of acetylene and oxygen bottles in one room shall not exceed 8, including cylinders used for portable welding equipment.
- (3) In mobile offshore units not provided with a central plant, portable welding equipment shall, when not in use, be kept in a fixed position in a separate and well ventilated room on the open deck. This room shall be gas-tightly separated from other rooms.

Section 16

Directions for use, signs/notices and marking

- (1) Entrance doors in gas cylinder centrals or rooms where acetylene and oxygen cylinders are stored shall be fitted with warning notices in accordance with the NS 6033 which in writing and illustrations clearly express:

GASS UNDER TRYKK
Beholderne skal bringes i sikkerhet under eventuell brann.

GAS UNDER PRESSURE
Remove cylinders to a safe place in case of fire.

- (2) The door shall also be fitted with prohibition signs in accordance with NS 6033 with a text clearly indicating:

GASSFARE
Åpen ild og røyking forbudt.
ADGANG FORBUDT

GAS DANGER
Fire, open light and smoking prohibited.
NO ADMITTANCE

- (3) In the immediate vicinity of gas central accessories, regulator and cylinders, etc., a sign shall be posted with directions for use and clearly worded text giving the necessary detailed instructions for the use of the gas cylinder central. The directions for use shall be in English and Norwegian.
- (4) In the immediate vicinity of the regulators, notices shall be posted, clearly stating the maximum pressures in the pipelines permitted between the regulators and the outlet stations.
- (5) Venting from safety valves and similar devices shall be marked with prohibition notice NS 6033 with the following text:

GASSFARE
Åpen ild og røyking forbudt.

GAS DANGER
Fire, open light and smoking prohibited.

- (6) In the outlet stations, notices indicating the operating pressure shall be posted. Signs shall also be posted clearly stating that the valves shall be closed when the installation is not in use.
- (7) Low-pressure pipes between regulators and outlet stations shall be painted or marked in such a way that there will nowhere be any doubt as to which gases are conveyed by the pipes.
- a) Acetylene pipes shall be painted/marked in: Red.
 - b) Oxygen pipes shall be painted/marked in: Blue.
- (8) Directions for use for the central plant and portable welding equipment as mentioned in the second paragraph shall be supplied by the equipment vendor.

Section 17

The carriage and handling of gas cylinders

- (1) During the carriage of acetylene and oxygen cylinders on board mobile offshore units and during the transportation of such cylinders to and from mobile offshore units a means of conveyance suited for the purpose shall be used.
- (2) A protecting cover shall always be screwed on the gas cylinders during carriage or other transportation and also at all times when the gas cylinders are not in use.
- (3) The gas cylinders shall not be exposed to bumps and jolts during transportation and other handling.

Section 18

Maintenance

Welding equipment shall be part of the offshore unit's maintenance system. Users shall have prepared set routines for the necessary checking of the equipment (hoses, etc.) before and after use.

Section 19

Entry into force

- (1) These Regulations enter into force on 1 July 2003.
- (2) For mobile offshore units which are registered in a Norwegian ship register, these Regulations enter into force at the first expiry of the certificate, cf. section 1.
- (3) Regulations of 17 December 1986 No. 2317 on welding equipment, etc. for the welding gases acetylene and oxygen on mobile offshore units are repealed from 1 July 2008.

Amended by Regulation of 29 June 2007 No. 1006 (in force 1 July 2007, previously section 20).