

Regulations of 17 December 1986 concerning welding equipment, etc. for the welding gases acetylene and oxygen on mobile offshore units

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Laid down by the Norwegian Maritime Directorate pursuant to the Act of 9 June 1903 No. 7 relating to Public Control of the Seaworthiness of Ships, etc., §§ 1, 9a and 42, cf. Royal Decrees of 12 October 1962, 5 April 1963, 1 December 1978 and 25 May 1984, and Formal Delegations of 15 January 1979 and 6 June 1984.

§ denotes Section

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§ 1

Definitions

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

1. **Acetylene:** C_2H_2 for storage in special gas cylinders (15 — 18 kp/cm² at 15°C)
2. **Oxygen:** O_2 in gaseous form for storage in special gas cylinders (150 or 200 kp/cm² at 15°C).
3. **Gas cylinder central:** Space for storage and connection of acetylene and oxygen bottles.
4. **Gas cylinder cabinet:** Locker of steel or other approved material, designed for storage and connection of acetylene and oxygen cylinders.
5. **Central system:** Gas cylinder central or gas cylinder cabinet with fixed manifolds (high pressure hoses, non-return valves, pipe lines and stop valves) and regulators as well as pipe lines with gas outlet stations.
6. **Outlet station:** Bracket with stop valves, regulators, manometer and non-return valves, for acetylene and oxygen placed in a locker or protected in another satisfactory way.
7. **Burner:** Welding burner or cutting burner of type-approved make, designed for the use of acetylene and oxygen.
8. **Portable welding equipment:** One acetylene cylinder and one oxygen cylinder, regulators, non-return valves, hoses and burners, etc., adapted to a portable appliance suitable for the purpose.
9. **Equipment supplier:** Firm supplying approved fittings/accessories and instructions to the installer.

Kilde: Sjøfartsdirektoratet
"Regler for flyttbare inn-
retninger" 1989-utg. (Utkommer i 1990)

10. *Installer*: Person or institution:
 - 10.1. having the qualifications necessary to carry out installation of piping and equipment on units,
 - 10.2. having specialist knowledge of the problems and safety precautions connected with installation, testing, inspection and use of central systems, and having practical experience in this field,
 - 10.3. complying with the special provisions and directions of the Norwegian Maritime Directorate at any installation of such systems, and being responsible that the regulations in force are met. It is the responsibility of the installer to ensure that the system to be installed, is approved.
 - 10.4. using the fittings, drawings, and instructions of the equipment supplier when carrying out the installation.
11. *Standard*: Norsk Standard (Norwegian Standard), NS.
12. *Approved*: Approved by the Norwegian Maritime Directorate.
13. *Unit*: Mobile platforms, including drilling ships, equipped for drilling for subsea petroleum deposits, and mobile platforms for other use than drilling for subsea petroleum deposits.
14. *Owner*: Whoever contracts and/or is responsible for the operation of a unit.
15. *Internal control*: All systematic measures to be taken by the owner in order to ensure that the activity is planned, organized, run and maintained in accordance with the requirements laid down in and pursuant to Acts and regulations, and also requirements and recommendations issued by the control institutions and recognized survey institutions concerned when carrying out control on behalf of the authorities.
16. *System audit*: Planned and systematic review of systems to ensure that these are established, followed and maintained as specified.
17. *System*: Formalized collection of mutually co-ordinated procedures.
18. *Verification*: Investigation/examination to confirm that an activity, product, or service is in accordance with specified requirements.

§ 2

Application

1. These regulations apply to units which are registered or which will be registered in a Norwegian Register of Ships.
2. Installation and testing of central gas systems shall be carried out in accordance with these regulations.

§ 3

Responsibility

1. It rests with the owner to ensure that the provisions of these regulations are complied with. The owner shall also ensure that whoever works for him, either in person, through employees or through independent contractors or sub-contractors, complies with the provisions of these regulations. Furthermore, it rests with the owner to see to it that welding equipment is maintained in a safe operational condition and in accordance with the regulations at all times.
2. The owner shall make the required arrangements and give the platform manager the necessary instructions by means of the operation manual or similar, so that the platform manager as part of the day to day operation can ensure that the operational requirements are complied with.

§ 4

Drawings

1. One copy of drawings of the central gas system, showing installations of equipment and piping, and also information required under the provisions of these regulations, shall be submitted to the Norwegian Maritime Directorate.
2. Drawings and information shall be submitted before the work is commenced. For units purchased from abroad for registration under Norwegian flag, drawings and information shall be submitted before the unit is put into operation under Norwegian flag.
3. It rests with the owner to ensure that corrected drawings are submitted in those cases where alterations are made during the building period.
4. Before being submitted to the Norwegian Maritime Directorate, drawings, information, etc. referred to in this section shall be checked by the owner through the system of internal control.

§ 5

Approval — system audit — verification

1. The documentation referred to under § 4, will normally not be subject to approval by the Norwegian Maritime Directorate.
2. The documentation submitted will normally be used for information and in connection with possible approaches from the owner concerning interpretation, evaluation of equivalent solutions and deviations. The documentation may furthermore be used in connection with system auditing and verification.
3. System auditing may be carried out by the Norwegian Maritime Directorate in order to check that the owner and whoever might be carrying out work on his behalf, have the required system and use it in such a way that the regulations are complied with.
4. Verification may be carried out by the Norwegian Maritime Directorate during the phases of construction and operation in order to ensure that activities, products or services which come under these regulations are in accordance with specified requirements.
5. The conditions mentioned in these regulations may be required verified to the extent the Norwegian Maritime Directorate finds necessary prior to the certificates of the unit being issued for the first time and at subsequent renewals of the certificates.

§ 6

Central gas system

A central gas system shall be installed where the number of gas cylinders on board exceeds one cylinder and one spare cylinder for acetylene and oxygen respectively, or a total of four gas cylinders. This number applies irrespective of cylinder size.

§ 7

Gas cylinder central

1. The gas cylinder central shall normally be a separate room. In deciding the location of the gas cylinder room, regard shall be taken to possible hazards of fire and explosion in case of fire on board. The room shall have bulkhead, deck and ceiling/roof made of steel and be gas-tightly separated from adjacent spaces. It shall have direct access from an open deck.
2. The gas cylinder central may be placed on an open deck. In that case, the gas cylinders in the central shall be placed in solid racks, and they shall be effectively protected against mechanical damage, direct exposure to sun, weather and wind. Above the central, there shall be a tight roof or cover of steel, and fittings, piping, etc. in the central shall be protected by e.g. a cover of steel, solid wire netting/grille or similar, which can be easily opened or removed for replacement of cylinders, etc. in the central.

3. The gas cylinder central shall be so insulated, ventilated and arranged that the temperature normally does not exceed 40°C. Where the location of the room and the conditions of temperature so permit, natural ventilation may be used. Materials used in connection with insulation, etc. shall be of an incombustible type. The ventilation system shall not be connected with other ventilation systems on board. Further, the room shall be ventilated in such a way that there is no risk of gas accumulation. Safety valves, etc. shall have outlet to an appropriate place on an open deck, see § 9 subsection 1.3.
4. The room shall not be used for other purposes than storage of gas cylinders. Pipe lines for inflammable liquids and gases shall not be carried through the central gas cylinder central.
5. Where the total number of acetylene and oxygen cylinders (irrespective of size), spare cylinders included, does not exceed 8, both gases may be kept in the same room.
6. Where the total number of acetylene and oxygen cylinders (irrespective of size), spare cylinders included, exceeds 8, the gas cylinder central shall consist of two gas-tightly separated rooms, one for acetylene and one for oxygen. Where the gas cylinder central is placed on an open deck, the arrangement shall be such as to leave a marked line of demarcation between the acetylene and oxygen cylinders in the central.
7. Electrical installations shall satisfy the regulations in force at the time in question concerning electrical installations on board ships and maritime appliances, laid down by the Norwegian Water Resources and Energy Board.
8. The gas cylinder central shall be clearly marked with signs stating that oxygen and acetylene cylinders are stored in the central or cabinet. The text of the sign shall furthermore be as required in § 13 subsection 1.
9. Fire or explosion in the gas cylinder central shall not imply serious consequences to the main strength of the unit, or to persons on board.

§ 8

Gas cylinders, accessories, etc.

1. Gas cylinders for acetylene and oxygen shall be of types approved by a recognized classification society or public authority. Cylinders of a greater volume than 50 litres are not allowed.
2. Gas cylinders, spare cylinders included, shall be stowed in an erect position and shall be securely fastened. The fastening arrangement shall be of a construction which permits rapid disconnection of cylinders.
3. Storage of acetylene and oxygen cylinders in machinery spaces are not permitted.
4. Burners, stop valves, regulators, non-return valves, high pressure pipes and other accessories in connection with the welding equipment shall be of type-approved makes.
5. In the case of replacements of accessories or part of accessories, only approved original parts shall be used in accordance with the instructions of the equipment supplier.

§ 9

Piping, etc.

1. High pressure side. Piping and accessories between gas cylinders and regulator.
 - 1.1. Acetylene pipes
 - 1.1.1. Pipes shall be of stainless steel. All pipes shall be seamless. Piping and accessories shall be dimensioned for 300 kp/cm² and shall be hydraulically tested at this pressure prior to installation.
 - 1.1.2. Copper and copper alloys with more than 65 % copper shall not be used in connection with acetylene.
 - 1.1.3. In central systems where two or more acetylene cylinders are connected with a manifold, the supply pipes between cylinders and manifold shall be fitted with type-approved non-return valves.

- 1.2. Oxygen pipes
 - 1.2.1. Pipes shall be of stainless steel or copper. All pipes shall be seamless. Piping and accessories shall be dimensioned for 300 kp/cm² and shall be hydraulically tested at this pressure prior to installation.
 - 1.2.2. In central systems where two or more oxygen cylinders are connected with a manifold, the supply pipes between cylinders and manifold shall be fitted with a type-approved non-return valve.
- 1.3. Safety valves, etc.

Safety valves and similar devices positioned in a gas cylinder central or cabinet shall have outlet to an open deck. The outlet shall be arranged in a safe place and at a height of at least 3 m above deck. The outlet shall be marked as required in § 13 subsection 4. See also § 7 subsection 3.
2. Low pressure side
 - 2.1. Pipes shall be seamless, made of ST 35 or equivalent material, and have a wall thickness of at least 2.5 mm.
 - 2.2. Pipe lines shall be laid freely and so that they will not be easily damaged. It shall be ensured that pipe lines are not carried through unventilated rooms, lockers, etc. Pipe lines shall not be laid in accommodation spaces for crew or passengers.
 - 2.3. Expansion loops shall be placed where necessary, and piping carried through decks or bulkheads shall be laid in protection tubes of hard plastics or fibre material. All pipes shall be securely fastened and where necessary be protected against damage. The distance between fastening clamps shall not exceed 2.5 metres.
 - 2.4. Pipe lines shall be laid with as few joints as possible. Joints shall be expertly welded, end to end. Joints shall be fitted in places readily accessible for inspection.
 - 2.5. Bulkhead penetrations and clamps shall be approved.
3. Outlet stations
 - 3.1. Outlet stations shall be located in a well ventilated place, and in such a way as to be protected against mechanical loads.
 - 3.2. Outlet stations on open decks shall be in lockers.

§ 10

Testing and control of central systems

1. Prior to installation of acetylene and oxygen pipe lines, piping as well as connections shall be thoroughly cleaned to remove grease, oil and other combustible substances. For the degreasing, trichloroethane or an equally effective degreasing agent may be used. Petrol shall not be used. After the degreasing, the pipes shall be rinsed with a 10 % solution of trisodium phosphate in water, with a view to corrosion protection. Pipe lines and connections shall then be blown clear with nitrogen, both prior to and after installation. Compressed air from an oil lubricated compressor or oxygen shall not be used.
2. After completed installation or repairs of a central gas system and otherwise at 5-year intervals, cf. § 11, all pipe lines shall be blown through and leakage tested before the system is put into service.
3. Blow-through of acetylene and oxygen piping shall be carried out with nitrogen. Nitrogen shall be blown in from the high pressure side and carried off at an outlet station. The outlet station(s) shall be removed during the blow-through process. At blow-through, the pressure shall be gradually increased to approx. 10 kp/cm² and the blow-through shall continue till dirt no longer escapes from the pipes. High pressure pipes shall be blown through separately.
4. For leakage testing of acetylene piping on the low pressure side, nitrogen shall be used, and the test pressure shall be 10 kp/cm². All valves, joints and other connections shall be swabbed with soapy water. After 8 hours, the pressure drop shall not exceed 0.4 kp/cm².
5. Acetylene piping on the high pressure side shall be leakage tested with nitrogen at 60 kp/cm². All valves, joints and other connections shall be swabbed with soapy water.

6. Oxygen piping on the low pressure side shall be leakage tested with nitrogen, and the test pressure shall be 12 kp/cm². All valves, joints and other connections shall be swabbed with soapy water. After 8 hours, the pressure drop shall not exceed 0.4 kp/cm².
7. Oxygen piping on the high pressure side shall be leakage tested with 200 kp/cm² oxygen or nitrogen. All valves, joints and other connections shall be swabbed with soapy water.

§ 11

Installation Certificate

1. After the completed installation, testing and inspection of a central system, an Installation Certificate shall be issued on a form prescribed by the Norwegian Maritime Directorate. The Installation certificate shall be issued by the person responsible for installation and inspection of the system. The person issuing the Installation Certificate shall by his signature certify that the system has been inspected and tested as required by the regulations, and that the system in other respects is in compliance with the regulations.
2. The Installation Certificate shall be issued for a period of maximum 5 years. The Certificate ceases to be valid if the system should be altered or suffers damage which might affect its fitness for use or its safety. After damage, alterations or replacement of vital parts of the system, the system shall be re-inspected, and a new Installation Certificate shall be issued. This certificate shall be clearly marked «Renewal of Installation Certificate».
3. The Installation Certificate (the original) shall be posted in the gas cylinder central or in the gas cylinder cabinet, and be so framed that it can be taken out for endorsements of annual inspections.
4. Copy No. 1 of the Installation Certificate shall be submitted to the Norwegian Maritime Directorate. Copy No. 2 shall be kept for at least 5 years by the person who issued the certificate.

§ 12

Portable welding equipment

1. Portable welding equipment consists of one bottle for oxygen and acetylene respectively, placed in a suitable portable appliance. The volume of the cylinder shall not exceed 50 litres.
2. 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 cylinders in one room shall not exceed eight, including cylinders used for portable welding equipment.
3. Storage of acetylene and oxygen cylinders is not allowed in machinery spaces or other rooms representing a fire hazard.

§ 13

Directions for use, signs/notices and marking¹

1. Entrance doors to gas cylinder centrals or rooms where acetylene and oxygen cylinders are stored, shall be equipped with warning notices in accordance with NS 6033, which in writing and illustrations clearly express:

GAS UNDER PRESSURE

Remove cylinders to safety in case of fire

GASS UNDER TRYKK

Beholderne skal bringes i sikkerhet under eventuell brann

The door shall also be fitted with prohibition signs in accordance with NS 6033 with a text clearly expressing:

GAS DANGER
Fire, open light and smoking prohibited

GASSFARE
Åpen ild og røyking forbudt

NO ADMITTANCE

ADGANG FORBUDT

2. In the immediate vicinity of gas central accessories, regulator and bottles, etc. a sign shall be posted with directions for use of the central system. The directions for use shall have a heading and a clearly worded text, giving the necessary detailed instructions for use of the gas cylinder central. The directions for use shall be in English and Norwegian.
3. In the immediate vicinity of regulators, signs shall be posted clearly stating the maximum allowable pressures in the pipe lines between the regulators and the outlet stations.
4. Venting from safety valves and similar devices shall be marked with a prohibition notice NS 6033 with the following wording:

GAS DANGER
Fire, open light and smoking prohibited

GASSFARE
Åpen ild og røyking forbudt

5. At the outlet stations, signs indicating working pressure shall be posted. There shall also be signs clearly stating that the valves shall be shut when the system is not in use.
6. 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 carried in the pipes. Marking of gas pipes shall be in accordance with Norwegian Standard (NS) 813.
7. Directions for use of the central system and portable welding equipment as referred to in subsection 2 above, shall be provided by the equipment supplier.

¹ The texts of warning notices and prohibition signs shall be in Norwegian as well in English.

§ 14

Carriage and handling of gas cylinders

1. A means of conveyance suited for the purpose shall be used for the carriage of acetylene and oxygen cylinders on board mobile offshore units and to and from such units.
2. A protective cap shall always be screwed on gas cylinders during transport and furthermore whenever the gas cylinders are not in use.
3. Gas cylinders shall not be exposed to bumps and jolts during transport or other handling.

§ 15

Operational provisions

1. When the central gas system is not in use, gas cylinder valves and other valves shall be closed.
2. Shut off valves at outlet stations shall be closed when the system is not in use.
3. Leakage control of pipings shall be carried out by the technical section leader or a person authorized by him at least once a year at ordinary operation pressure for oxygen and acetylene respectively. Gas supplies to the pipes shall be stopped by closing the central regulator, and the pressure in the pipes shall then keep constant for at least 8 hours. If there is a pressure fall in pipes for oxygen and/or acetylene, the system shall be inspected and repaired by an installer, and a new Installation Certificate shall be issued. The annual test shall be endorsed in the Installation Certificate in the gas cylinder central.

§ 16

Deviations

1. The Norwegian Maritime Directorate may deviate from the requirements of these regulations where special reasons make this necessary or reasonable.
2. If the requirements of the coastal state and the requirements of these regulations are incompatible, the Norwegian Maritime Directorate may deviate from the requirements to the extent this is deemed justifiable.

§ 17

Penalty

Wilful or negligent violation of these regulations is punishable by fines pursuant to the General Civil Penal Code of 22 May 1902 No. 10, § 339 subsection 2, provided no stricter penalty is applicable pursuant to other statutory provisions.

§ 18

Entry into force, etc.

These regulations enter into force on 2 February 1987.