

Proposal for Regulations concerning drinking water and drinking water systems on mobile offshore units

Laid down by the Norwegian Maritime Authority on dd.mm.20yy under the Act of 16 February 2007 No. 9 relating to Ship safety and Security (Ship Safety and Security Act) sections 2, 6, 9, 11 and 26, cf. Royal Decree of 16 February 2007 No. 171 and Formal Delegation of 31 May 2007 No. 590 by the Ministry of Trade, Industry and Fisheries.

EEA references: EEA Agreement, Annex II Chapter XIX point 1. Directive 98/34/EC (amended by Directive 98/48).

Chapter 1. Scope of application

Section 1 Scope of application

These Regulations apply to Norwegian mobile offshore units.

Chapter 2. Requirements for the drinking water

Section 2 Requirements for quality and water treatment

- (1) The drinking water shall be hygienically safe. It shall:
 - a) be clear and without conspicuous odour, taste or colour;
 - b) not contain physical, chemical or biological components that could lead to a risk of harm to human health;
 - c) comply with requirements for quality and sampling in Annex to Regulations of 4 December 2001 No. 1372 concerning water supply and water intended for human consumption.
- (2) Drinking water shall be disinfected as a final step of treatment when the drinking water is brought out of the drinking water tank for consumption.
- (3) Chemical products for treatment of drinking water or drinking water systems shall be on the Norwegian Food Safety Authority's or the Norwegian Institute of Public Health's list of such products.
- (4) For the purpose of these Regulations, "drinking water" means all water intended for drinking, cooking, food preparation or other domestic purposes.

Section 3 Drinking water bunkered from shore or supply vessels

- (1) Drinking water being bunkered from shore or from supply vessels shall come from officially approved water supply systems.
- (2) The drinking water shall be chlorinated during transfer to the unit's drinking water tanks.

Section 4 Drinking water produced from seawater

- (1) Intake of seawater shall not take place in near-coastal areas, ports or other areas where seawater may be polluted.
- (2) For drinking water produced by means of:
 - a) evaporation, a maximum salinity of 30 ppm shall be permitted, corresponding to a specific electric conductivity of 6 mS/m at 25°C measured at the evaporator outlet;
 - b) reverse osmosis, a maximum of 200 ppm chloride and 130 ppm sodium shall be permitted, corresponding to a specific electric conductivity of 75 mS/m at 25°C measured at the outlet of the osmosis installation.

Chapter 3. Design, operation and cleaning of drinking water systems

Section 5 Risk assessment and control

- (1) A risk and vulnerability analysis shall be carried out for the drinking water system. The analysis shall take account of:
 - a) potential contaminants;
 - b) implementation of necessary risk mitigating measures;
 - c) establishment of emergency plans;
 - d) the necessary number of sea water inlets and protection against backflow from other sea water consumers
 - e) that there shall always be enough water available.
- (2) Procedures describing the control of critical points in the water supply shall be available.
- (3) It shall be documented that the use of protective coatings in tanks for drinking water is in conformity with the supplier's recommendation for pretreatment, application, hardening and cleaning.

Section 6 General requirements for drinking water systems

- (1) Drinking water systems shall be dimensioned for a consumption of at least 200 litres of drinking water per person per day.
- (2) Tank volume shall ensure that enough water is always available, and shall consist of at least two separate storage tanks. Units which do not produce their own drinking water shall have at least three separate storage tanks.
- (3) Chlorination in accordance with section 3 second paragraph shall be carried out with a system installed before the drinking water tank, and the system shall be dimensioned for maximum water supply. Chlorination systems shall be designed so that it is possible to add and mix in extra chlorine if water analyses indicate that this is necessary, cf. section 14 subparagraph f.
- (4) Drinking water systems shall be protected against frost and heat. Hot water shall have a temperature of 65°C at the heater outlet, and at least 60°C after one minute of tapping at any point on the water mains.
- (5) Materials that come into contact with drinking water shall not give off substances to the water in such quantities as to make the water hazardous to health or unsuitable as drinking water, and shall be capable of tolerating the drinking water quality for which the system is designed.
- (6) The drinking water system shall have two independent systems with salinometers and dump valves which give off an alarm and shut off the water supply when the salt content of the produced water is too high, cf. section 4 second paragraph.
- (7) The drinking water system shall have testing points making it possible to trace water quality changes through the system.

Section 7 Drinking water tanks

- (1) Drinking water tanks shall have:
 - a) cofferdams on tank sides which are not adjoining other drinking water tanks;
 - b) openings for inspection and cleaning. The openings shall have a tight manhole cover and be so located that inspection and cleaning may take place when the unit is in operation;
 - c) drainage facilities so that the tanks can be emptied completely;
 - d) sufficient ventilation. The ventilation pipes shall be so constructed that seawater cannot penetrate, and the openings shall be protected by a fine net of corrosion proof material;
 - e) as few interior frames and struts as possible. Interior surfaces and structures shall be easy to clean and maintain. If the tank is over four metres high permanent interior access platforms shall be installed.

- (2) Pipes which carry other products than drinking through drinking water tanks, shall be lead through open ducts (pipe-in-pipe).
- (3) In the event of initial application and complete renewal of protective coatings in drinking water tanks, the work shall be approved by a FROSIO level III certified inspector or a NACE level 2 certified inspector. Protective coatings for drinking water tanks shall be suitable for drinking water purposes, and be medically assessed by the Norwegian Institute of Public Health.
- (4) A mobile offshore unit need not comply with the requirements of the first paragraph subparagraph a when one of the following requirements is met:
 - a) the unit is certified before 1 January 2015;
 - b) building contract has been placed before 1 January 2015.

Section 8 UV units

- (1) UV units shall have:
 - a) sufficient processing capacity at maximum water supply and at the poorest water quality, cf. section 2 first paragraph subparagraph c;
 - b) timer;
 - c) intensitometer;
 - d) signal lamps for each UV tube;
 - e) solenoid valve which shuts off the supply of water in the event of alarm or power failure.
- (2) UV units shall be on the Norwegian Institute of Public Health's list of biosimetrically tested UV units.
- (3) A mobile offshore unit initially certified before 1 January 2015 needs not comply with the requirement of the second paragraph until replacement of the UV unit.

Section 9 Alkalisiation plants

In alkalisiation plants means shall be provided for:

- a) sufficient return flushing of the filter;
- b) easy access for interior maintenance, and replacement of the filter materials.

Section 10 Pipes in the drinking water system

- (1) Pipes in the drinking water system shall be:
 - a) clearly marked "Drikkevann/Drinking water";
 - b) lead through open ducts (pipe-in-pipe) when they penetrate other tanks.
- (2) The pipe network shall be so designed that:
 - a) water temperatures between 20 and 60°C are prevented;
 - b) the water rate is kept high;
 - c) the amount of water remaining lentic over time is minimised.
- (3) There shall not be blind pipes in the drinking water system.
- (4) Pipes in the drinking water system shall be protected against pollution through backflow in accordance with the following requirements:
 - a) As protection against pathogenic microbes an unrestricted air gap between the drinking water and technical connections shall be provided. The air gap shall be at least 20 mm and at least twice the pipe diameter, measured from the crane's underside to the highest possible fluid level.
 - b) As protection against toxic, radioactive, mutagenic or carcinogenic substances there shall be a barrier in accordance with subparagraph a, or backflow protection with controllable zone with reduced pressure. The backflow protection shall have a guard valve before and after, and a particle filter upstream.

c) As protection against water which does not constitute a health risk, but which may have altered taste, odour, colour or temperature, a barrier according to subparagraph a or b, or a controllable non-return valve shall be provided.

(5) As an alternative to the requirements of the fourth paragraph other relevant technical barriers as described in NS-EN 1717 may be used.

Section 11 Seawater inlets

(1) Seawater inlet for drinking water shall be so located that the risk of influences from discharges from the unit is as low as possible. In the event of several inlets, the inlet which at any time is most favourable in relation to conditions of current and pollution shall be used.

(2) On units certified after 1 January 2015 seawater inlets used in the production of drinking water shall be separated from inlets for cooling water for machinery. The drinking water inlet shall be physically closed off when the unit is in near-coastal areas, ports or other areas where seawater may be polluted.

Section 12 Bunkering station

(1) Bunkering stations shall be provided with a shut-off valve. Between the shut-off valve and the hose connection there shall be a water test tap and a flush valve.

(2) The flush valve shall be readily accessible and shall have the same capacity as the bunkering pipe.

Section 13 Measuring equipment

There shall be equipment on board mobile offshore units for measuring electric conductivity (salinity), PH value, colour and chlorine content.

Section 14 Bunkering documentation

Bunkering shall be documented. The declaration shall contain information about:

- a) supply vessel and whether the vessel has added chlorine to the water;
- b) the water works used ashore and the water works' default value for electric conductivity;
- c) colour, odour, taste, clarity, electric conductivity and pH value for each tank from which the supply vessel supplies water;
- d) amount of water bunkered;
- e) amount of chlorine added;
- f) chlorine measurements for each tank where water has been bunkered. The measurements shall be made at least 30 minutes after the bunkering is completed, and the residual chlorine value shall be above 0.05 mg/l Cl₂.

Section 15 Cleaning of tanks, pumps and pipe systems

(1) Tanks, pipes and pipe systems for drinking water shall be kept clean on the inside.

(2) The drinking water system shall be cleaned and disinfected at least once a year, before the unit leaves the yard and after repairs of the drinking water system.

(3) Lentic water shall be flushed weekly with full pressure.

(4) Shower heads and shower hoses shall be disinfected at least every quarter of the year.

Chapter 4. Final provisions

Section 16 Exemptions

(1) The Norwegian Maritime Authority may exempt a mobile offshore unit from one or more of the requirements of the Regulations if the company applies for an exemption in writing and one of the following requirements is met:

a) it is established that the requirement is not essential and that it is justifiable in terms of safety;

b) it is established that compensating measures will maintain the same level of safety as required by these Regulations;

c) it is established that the requirement hinders the development and use of innovative solutions when such solutions will maintain the same level of safety as required by these Regulations.

(2) Statement from safety representative shall be attached to the application for exemption.

Section 17 Transitional provision

As an alternative to sections 2 to 16 Appendix I may be complied with until the next certificate renewal if one of the following requirements is met:

a) the unit is certified before 1 January 2015;

b) building contract has been placed before 1 January 2015.

Section 18 Entry into force

(1) These Regulations enter into force on 1 January 2015.

(2) As from the same date the Regulations of 4 September 1987 No. 860 concerning potable water system and potable water supply on mobile offshore units are repealed.

Appendix I

Cf. section 17

(Excerpts from Regulations of 4 September 1987 No. 860 concerning potable water system and potable water supply on mobile offshore units).

Section 6

Quantity and quality requirements

Potable water shall be available in sufficient quantities, be hygienically satisfactory and shall also be clear, without smell, flavour or colour and satisfy the quality requirements of the Ministry of Health in force at any time.

Section 7

Potable water supplied from ashore

1. For units on the Norwegian part of the Continental Shelf, potable water supplied from ashore shall only be taken from filling points connected to water works which are officially approved and deliver water in accordance with valid quality requirements.
2. Potable water supplied from ashore shall be chlorinated during transfer to the unit's storage tanks.

Section 8

Potable water produced from sea water

1. Intake of sea water for production of potable water shall not take place when there is reason to believe that the sea water is particularly polluted. All harbour areas in all parts of the world shall be regarded as being particularly polluted.
2. From installations producing fresh water by means of distillation, a maximum salinity of 30 ppm shall be permitted, corresponding to a specific electric conductivity of 6 m S/m at 25°C at the evaporator outlet. From installations producing fresh water by means of reverse osmosis, a maximum of 200 ppm chloride and 130 ppm sodium shall be permitted, corresponding to a specific electric conductivity of 75 m S/m at 25°C at the outlet of the osmosis installation.
3. Chemicals wanted for use in the desalination plant shall be certified.

Section 9

Requirements for water treatment

All potable water shall be disinfected at the time of consumption. Additives (treatment chemicals) for potable water shall be certified.

Section 10

Control of potable water on board

1. At least once a day a check shall be made to verify that all parts of the potable water system function satisfactorily, and the results shall be recorded in a special operation log.
2. Where UV lamps are used for the disinfection of potable water, burning hours of the lamps shall also be recorded in the operation log.
3. The company shall ensure that at least one person on board is qualified for checking the potable water as mentioned above.

Section 11

Equipment and design

1. The following requirements shall apply for dimensioning and design of potable water plant:

- a) Designed consumption shall be at least 200 litres potable water per person per day,
- b) there shall at all time be a minimum reserve of potable water corresponding to 2 days' consumption,
- c) there shall be at least two separate storage tanks for potable water,
- d) it shall be separated from other systems for fluids on board by means of a discontinued connection, double non-return valves or equivalent arrangements,
- e) it shall be protected against frost and heat and capable of tolerating the potable water quality for which the system is designed,
- f) it shall include a permanently installed system for chlorination of potable water supplied from supply vessels. The chlorine dosage point shall be located at the tank's filling pipe or recirculation pipe,
- g) it shall be possible to add and mix in extra chlorine if water analyses indicate that this is necessary,
- h) materials that come into contact with potable water shall not give off substances to the water in such quantities as to make it hazardous to health or unsuitable as drinking water. Protective coating (paints) shall be certified,
- i) there shall be testing points making it possible to trace water quality changes through the system,
- j) at the outlet of the potable water from any desalination unit, a salinometer shall be installed, which gives alarm and shuts off water supply when the salt content is too high,
- k) where UV units are used, the UV unit shall have sufficient disinfecting capacity at the maximum water supply. The UV unit shall also have a timer, an intensitometer, signal lamps for each UV tube, and a solenoid valve which shuts off the supply of water in the event of an alarm or power failure,
- l) where alkalization plants are used, means shall be provided for sufficient return flushing of the filter and easy access for the filter maintenance and replacement of the filter materials, and
- m) hot water shall have a temperature of at least 65°C at the heater outlet. Additives for use in any heating medium shall be certified.

2. The following requirements apply to potable water tanks:

- a) they shall have no joint walls with other tanks carrying petroleum products, liquid chemicals etc.,
- b) if pipes not carrying potable water have to be carried through a potable water tank, they shall be carried through open ducts,
- c) they shall be provided with an opening for access for inspection and cleaning. The openings shall have a tight manhole cover and be so located that inspection and cleaning of the tank may take place while the unit is in operation,
- d) there shall be satisfactory means for draining the tanks so that the tanks easily can be emptied completely,
- e) sounding pipes and feeding pipes for portable tanks shall have a height above deck or tank top of at least 300 mm and have caps. The cap shall be attached to the pipe by a chain so that the cap cannot come into contact with the floor/deck or tank top, and
- f) they shall have sufficient ventilation. The ventilation pipes shall be so constructed that seawater cannot penetrate. The openings shall be protected by a fine net of corrosion proof material.

3. The following requirements apply to pipes in potable water systems:

- a) if pipes carrying potable water have to be carried through other tanks, they shall be carried through open ducts,

- b) the pipes shall be clearly marked "Drikkevann/Potable water" and be painted or marked in blue colour,
- c) the hose connections etc. located outside the living quarter shall be secured by means of a non-return valve or an equivalent arrangement, and
- d) where connected to machinery equipment (such as washing machines), the potable water system shall be protected against back-suction/back-flow.

4. Seawater intake

For production of potable water by evaporation of seawater, there shall as a minimum be two alternative seawater intakes. The intakes shall be so located that the risk of influence from discharges from the unit is as low as possible, and it shall be possible to use the intake which at any time is most favourable in relation to conditions of current and pollution. Branch-offs from seawater pipe that serves desalination units shall be equipped with backflow preventor.

5. Bunkering station

Bunkering stations shall be provided with a shut-off valve. Between the shut-off valve and the hose connection there shall be a water test tap and a flush valve. The flush valve shall be readily accessible and appropriately designed, its diameter corresponding to the capacity of the bunkering pipe.

6. Measurement equipment

There shall be laboratory equipment for measuring electric conductivity (salinity), PH value and chlorine content on board.

Section 12

Cleaning of tanks, pumps and pipe systems

Tanks, pipes and pipe systems for potable water shall at all times be kept clean on the inside all the way to the tapping points. Cleaning and disinfection of the entire potable water system shall be carried out before the unit leaves the yard, after repairs and then at least once a year.