

**REGULATIONS RELATING TO DESIGN AND OUTFITTING OF
FACILITIES ETC. IN THE PETROLEUM ACTIVITIES
(THE FACILITIES REGULATIONS)**

**Petroleum Safety Authority Norway (PSA)
Norwegian Pollution Control Authority (SFT)
Norwegian Social and Health Directorate (NSHD)**

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CHAPTER I INTRODUCTORY PROVISIONS

Section 1 Definitions

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

Class A fire division

A division made of non-combustible materials fulfilling the following criteria:

- a) it shall be sufficiently braced
- b) it shall prevent the propagation of flames and smoke for a minimum of one hour of the standardised fire test,
- c) it is designed so that the average temperature and the temperature at any single point on the unexposed side does not exceed 140 degrees C and 180 degrees C respectively above the initial temperature within the time limits stated below:
 - Class A-60: 60 minutes,
 - Class A-30: 30 minutes,
 - Class A-15: 15 minutes,
 - Class A- 0: 0 minutes,
- d) insulation materials, if any, shall be fire tested at an institution which is internationally or nationally recognised in the specific technical field

Class B fire division

A division made of non-combustible materials fulfilling the following criteria:

- a) it shall prevent the propagation of flames for a minimum of one half hour of the standardised fire test,
- b) it is designed so that the average temperature on the unexposed side does not exceed 140 degrees C above the initial temperature. Furthermore the temperature shall not at any single point exceed 225 degrees C above the initial temperature within the time limits stated below:
 - Class B-30: 30 minutes
 - Class B-15: 15 minutes
 - Class B- 0: 0 minutes

Class H fire divisions

A division made of non-combustible materials fulfilling the following criteria:

- a) it shall be sufficiently braced,
- b) it shall prevent the propagation of flames and smoke for a minimum of two hours of the standardised fire test,
- c) it is designed so that the average temperature and the temperature at any single point on the unexposed side does not exceed 140 degrees C and 180 degrees C respectively above the initial temperature within the time limits stated below:
 - Class H- 120: 120 minutes,
 - Class H-60: 60 minutes,
 - Class H-0: 0 minutes,
- d) insulation materials, if any, shall be fire tested at an institution which is internationally or nationally recognised in the specific technical field

Loadbearing structures:

Those parts of the facility for which the main purpose is transfer of loads

Design load:

Characteristic load multiplied by load coefficients.

Dimensioning accidental load:

Accidental load that the facility or a function shall be able to withstand during a required period of time.

Dynamic positioning system (DP-system):

A system where power supply, thruster system and control system are assembled and can be operated so that a fixed position is maintained automatically.

Simpler facilities with overnight stay possibility

Facilities which are normally unmanned, and which are equipped with emergency quarters.

Simpler facilities without overnight stay possibility

Facilities without accommodation possibilities and helicopter deck, and which

- a) are only manned in connection with maintenance,
- b) are only manned in daylight and in satisfactory weather conditions so that personnel can leave the facility safely after completed work,
- c) are not included as a part of an integrated development concept or do not constitute a danger to other facilities in the area or otherwise affect the operation of other facilities in an unacceptable way.

Anchoring system

Anchoring system of a catenarian construction or a combination of a thruster system and catenary anchoring system

Functional loads

Loads which are caused by physical existence, use and treatment of the facility.

High pressure and high temperature wells (HPHT wells)

Wells having an expected shut-in wellhead pressure greater than 69 MPa (690 bar), or a temperature exceeding 150 °C.

Lifting appliance

Combined unit used for hoisting and lowering of cargo, with or without horizontal movement.

Lifting gear:

Components or equipment used between the lifting appliance and the cargo or on the cargo to grip it, and which is not an integrated part of the lifting appliance.

Environmental loads

Loads caused by natural conditions.

Permanently manned facilities:

Facilities that are continuously manned, or which are incorporated as a part of an integrated development concept with bridge connections.

Safety system:

A system which realises one or more active safety functions.

Safety functions

Physical measures which reduce the probability of a situation of hazard and accident occurring, or which limit the consequences of an accident.

Pipeline systems:

Subsea pipelines and risers which transport hydrocarbons and other media, with associated safety systems, valves, locks, corrosion protection systems and other equipment.

Accidental loads:

Loads which the facility can be subjected to when incorrectly used, in the event of technical failure or an undesirable external effect.

Section 2

Systems and other equipment for manned underwater operations from vessels

Requirements to facilities in these regulations also apply to systems and equipment necessary to carry out manned underwater operations from vessels.

CHAPTER II GENERAL PROVISIONS

Section 3

Choice of development concept

In choosing a development concept the following shall be taken into consideration:

- a) major accident risk,
- b) form of operation,
- c) risk of pollution,
- d) geographic location,
- e) location conditions,
- f) reservoir properties,
- g) requirements to regularity,
- h) life time,
- i) subsequent removal, if any,
- j) need for development of new technology.

Section 4

Design of facilities

Facilities shall be based on robust and the simplest possible solutions and shall be designed so that

- a) they can withstand loads as mentioned in [Section 10](#) on loads, load effects and resistance,

- b) the major accident risk becomes as low as practically possible,
- c) failure of a component, a system or one single mistake does not lead to unacceptable consequences,
- d) the main safety functions, as mentioned in [Section 6](#) on main safety functions, are maintained,
- e) transport and handling of materials can take place efficiently and safely, cf. [Section 12](#) on handling of materials and transport routes, access and evacuation routes,
- f) provision is made for a sound working environment, cf. [Chapter III-II](#) on design of work areas and accommodation spaces,
- g) operational prerequisites and limitations are duly complied with,
- h) there are adequate provisions in place to ensure health and hygiene on board,
- i) provision is made for the lowest possible risk of pollution,
- j) provision is made for fully satisfactory maintenance.

Measures to protect facilities against fire and explosion shall be based on a strategy.

The areas on the facility shall be classified in such way that design and location of areas and equipment contribute to reducing the risk related to fire and explosion.

Areas where personnel are staying, or where equipment of significance to safety is placed, shall not be within reach of waves with an annual probability greater than 1×10^{-2} .

Section 5

Design of simpler facilities without overnight stay possibility

Simpler facilities without overnight stay possibility shall be designed to accommodate the requirements to acceptable risk, cf. the [Management Regulations Section 6](#) on acceptance criteria for major accident risk and environmental risk. Provision shall also be made for sound working environment and satisfactory hygienic conditions during stays on the facility.

Where these regulations describe specific solutions, simpler solutions may be chosen for such facilities than those given here, if it can be demonstrated through specific assessments that this is justifiable.

Correspondingly, simpler solutions may be considered than those recommended in the comments to the individual provisions contained in these regulations.

Section 6

Main safety functions

The main safety functions shall be defined unambiguously in respect of each individual facility in order to ensure the safety for personnel and to limit pollution.

With regard to permanently manned facilities the following main safety functions shall be maintained in the event of an accident situation:

- a) preventing escalation of accident situations so that personnel outside the immediate vicinity of the scene of accident, are not injured,
- b) maintaining the main load carrying capacity in load bearing structures until the facility has been evacuated,
- c) protecting rooms of significance to combating accidental events, so that they are operative until the facility has been evacuated, cf. [Section 29](#) on fire divisions,
- d) protecting the facility's safe areas so that they remain intact until the facility has been evacuated,
- e) maintaining at least one evacuation route from every area where personnel may be staying until evacuation to the facility's safe areas and rescue of personnel has been completed.

Section 7

Safety functions

Facilities shall be equipped with necessary safety functions which at all times are able to

- a) detect abnormal conditions,
- b) prevent abnormal conditions from developing into situations of hazard and accident,
- c) limit harm in the event of accidents.

Requirements to performance shall be set in respect of safety functions.

The status of safety functions shall be available in the central control room.

CHAPTER III MULTIDISCIPLINARY PROVISIONS

III-I MULTIDISCIPLINARY COMMON REQUIREMENTS

Section 8

Qualification and use of new technology and new methods

Where the petroleum activities involve use of new technology or new methods, criteria shall be prepared with regard to development, testing and use in order to fulfil the requirements to health, environment and safety. The criteria shall be representative of the relevant operational conditions, and the technology or the methods shall be adapted to already accepted solutions.

Qualification or testing shall demonstrate that applicable requirements can be fulfilled by use of the relevant new technology or new methods.

Section 9

Plants, systems and equipment

Plants, systems and equipment shall have a design which is robust and as simple as possible, so that

- a) the possibility of human errors or mistakes is limited,
- b) they or it can be operated, tested and maintained without danger to personnel and with the lowest possible pollution risk,
- c) they are or it is suitable for use and capable of withstanding the loads they or it may be subjected to during operation.

Plants, systems and equipment shall be marked in order to provide for safe operation and fully satisfactory maintenance.

Work equipment comprised by Sections 2 and 4 of [regulations of 26 June 1998 No. 608 relating to use of work equipment](#), last amended 13 December 2004, shall be designed in accordance with the provisions contained in said regulations chapters IV, V and VI.

Section 10

Loads, load effects and resistance

The loads that may affect facilities or parts of facilities, shall be determined. Accidental loads and environmental loads with an annual probability greater than or equal to 1×10^{-4} shall not cause the loss of a main safety function, [cf. Section 6](#) on main safety functions.

When loads are determined, the effects of seabed subsidence above or in connection with the reservoir shall be taken into account.

Functional and environmental loads shall be combined in the most unfavourable way.

Facilities or parts of facilities shall be able to withstand the design loads and the probable combinations of these loads at all times.

Section 11

Materials

Materials to be used in or on facilities shall be selected with a view to

- a) the requirements to loads as mentioned in [Section 10](#) on loads, load effects and resistance,
- b) manufacturing, assembling and construction processes,
- c) use of material protection, if any,
- d) fire technical properties,
- e) probable changes in operational conditions,
- f) possibilities for reduction of future use of chemicals and pollution,

- g) possibilities for reduction of, re-use and recycling of waste,
- h) the employees' health and working environment,
- i) possible future removal.

Section 12

Handling of materials and transport routes, access and evacuation routes

Facilities and transport routes shall be designed so that handling of materials and personnel traffic can take place efficiently and safely. Handling of materials shall to the extent possible take place by means of mechanical systems and technical appliances.

Where the access between two different levels is used on a daily basis, there shall be a stairway or access ramp.

Evacuation routes shall be designed so that all evacuation can take place in a simple, quick and safe way. From areas with general movement there shall be at least two evacuation routes.

Section 13

Ventilation and indoor climate

Ventilation in indoor and outdoor areas shall satisfy the need for air change and provide acceptable air quality. The ventilation shall furthermore be arranged so that smoke from fires can be controlled, and so that flammable gases cannot penetrate into enclosed unclassified areas.

The indoor climate shall be adapted to the individual room with regard to air requirement, draught, humidity and temperature. Indoor air shall be free of pollution harmful to health.

Section 14

Chemicals and chemical exposure

Technical solutions which prevent harmful chemical exposure to human beings and the environment, and which reduce the need for use of chemicals, shall be chosen.

When choosing, designing and locating facilities for storage, use, recycling and destruction of chemicals, account shall be taken of

- a) health and safety of personnel,
- b) corrosion and other forms of disintegration of materials,
- c) fire and explosion hazard,
- d) pollution risk.

[Regulations of 25 January 2005 No. 47 relating to soluble chromium VI in cement](#) shall apply to the scope of application of these regulations.

Section 15

Flammable and explosive goods

The area for storage of flammable goods and explosives shall be designed to minimise the consequences of fire and explosion.

Provision shall be made so that explosives that may constitute a danger, can easily be handled and removed in the event of a situation of hazard and accident.

Explosives shall be secured against unintentional discharge during storage and use.

Section 16

Instrumentation for monitoring and recording

Facilities shall be equipped with the necessary instrumentation for monitoring and recording of conditions and parameters that may be of significance in the verification of results from analyses and calculations and parameters of significance to the integrity of the facility.

Facilities shall in addition be equipped with instrumentation for recording of environmental data that may be of significance to the petroleum activities. Instrumentation for aviation weather service

on facilities shall fulfil the requirements of section 31 in the Civil Aviation Authority's [regulations of 26 October 2007 No. 1181 relating to continental shelf aviation – commercial air transport to and from helidecks on facilities and vessels at sea](#), last amended 28 January 2008, and of the [Civil Aviation Authority's regulations 28 January 2008 no. 81 relating to meteorological services for aviation](#).

The first facility of a new type shall have instrumentation for acquisition of data to verify the calculations. Fixed reference electrodes shall be installed on the first facility in areas where the corrosive conditions deviate from areas of past experience.

Section 17

Systems for internal and external communication

Temporarily or permanently manned facilities shall be equipped with communication systems making internal communication on the facility, as well as between the facility and ships, aircraft and land, possible at all times. Furthermore these facilities shall be equipped with alarm systems capable of alerting the personnel to situations of hazard and accident at all times. It shall be possible to give the following sound and light alarms:

- a) general alarm in the form of intermittent audible signals and yellow flashing light,
- b) prepare for evacuation in the form of uninterrupted audible signals and yellow flashing light:

There shall be established at least two independent warning routes to shore, preferably by means of permanent communication systems.

Section 18

Communication equipment

Equipment for external communication shall be chosen on the basis of operational needs, type of activity and defined situations of hazard and accident, cf. the [Management Regulations Section 15](#) on quantitative risk analyses and emergency preparedness analyses.

Communication equipment and associated power supply shall be designed and protected to remain functional in the event of situations of hazard and accident.

III-II

DESIGN OF WORK AREAS AND ACCOMMODATION SPACES

Section 19

Ergonomic design

Work areas and work equipment shall be designed and placed in such way that the employees are not subjected to adverse physical or mental strain as a result of manual handling, work position, repetitive movements or work intensity etc. that may cause injury or illness.

Workplaces and work equipment shall also be designed and placed in such way that the danger of mistakes that may be significant to safety, is reduced.

Workplaces shall provide for the possibility of individual work positions.

When carrying out work operations from their normal position and with a good working posture the employees shall have a view which enables them to make sure that the work can be carried out safely.

Section 20

Man-machine interface and information presentation

Screen-based equipment and other technical equipment for monitoring, controlling and running machinery, plants or production processes, shall be designed in such way that the danger of mistakes that may be significant to safety, is reduced.

Information transmitters and operating devices shall be designed, placed and grouped to allow simple and quick reception of necessary information and conduct of necessary actions. The information presented shall be correct and easily understandable.

In the event of incidents, deviations or failures in systems of significance to safety, alarms that stand out clearly from other information shall be given. The alarms shall be given in such way that they can be perceived and acted on in the period of time required for safe operation of equipment, plants and processes.

Section 21

Outdoor work areas

Outdoor work areas shall have adequate weather protection so that the danger of health complaints and mistakes is reduced.

Weather protection in outdoor areas shall be adapted to anticipated periods of stay, the extent and character of the work, representative weather conditions and risk conditions.

Section 22

Noise and acoustics

Facilities shall be designed so that no employee is exposed to noise that is harmful to hearing. By noise that is harmful to hearing is meant a daily noise exposure which in the course of a workshift exceeds a twelve-hour equivalent sound level of 83 dB(A), or an impulsive sound level of $L_{peak} = 130$ dB(C).

Requirements shall be set with regard to noise and acoustics in the individual areas based on the planned manning and the functions to be provided for in the areas. Noise level and acoustics shall not obstruct communication which is of significance to safety. The noise level in cabins, break rooms and recreation rooms shall be reduced as much as possible to contribute to necessary restitution and rest.

Section 23

Vibrations

Facilities shall be designed so that vibrations will not harm personnel staying on the facility, or will make it difficult for the personnel to carry out important work tasks. [Regulations of 6 July 2005 No. 804 relating to protection against mechanical vibrations](#), last amended 19 December 2006, shall apply to the scope of application of these regulations.

Section 24

Lighting

Lighting shall be such that working environment and safety are fully satisfactory in respect of work, movement and restitution.

Daylight in and view from work and accommodation spaces shall if possible be provided.

Section 25

Radiation

Facilities shall be designed so that exposure to radiation is limited.

Provision shall primarily be made for technical solutions which reduce the need for use of radioactive substances. Where radioactive substances nevertheless have to be used, provision shall be made for safe transport, handling and storage of the substances.

Section 26

Equipment for transportation of personnel

Equipment for transportation of personnel shall be designed to ensure the safety of personnel that are carrying out activities above normal working height, or that are being transported by means of such equipment..

Personnel winches shall be such that spooling can be performed safely and be secured against uncontrolled unwinding so that users cannot fall freely.

Section 27

Safety signs

If it cannot be avoided through technical measures or other arrangements that employees are subjected to risk of accidents or injury, safety signs shall be installed.

Safety signs shall be installed at the entrance to rooms and near zones or equipment where the employees may be subjected to risk of accidents or health injury.

Equipment for danger limitation, rescue and evacuation, and the access way to this equipment, shall also be marked with such signs.

Signposting with safety signs comprised by [regulations of 6 October 1994 N. 0972 on safety signposting in the workplace](#), last amended 30 June 2003, shall be designed in accordance with the provisions of the said regulations.

III-III

PHYSICAL BARRIERS

Section 28

Passive fire protection

Where passive fire protection is used, it shall be designed so as to give relevant structures and equipment adequate fire resistance with regard to load bearing properties, integrity and insulation properties during a dimensioning fire.

In the design of passive fire protection, the cooling effect from fire-fighting equipment shall not be taken into account.

Section 29

Fire divisions

The main areas on facilities shall be separated by fire divisions capable of resisting the dimensioning fire and explosion loads and shall at least fulfil fire class H-0 if they may be exposed to hydrocarbon fires.

Spaces with important functions and important equipment and spaces with a high fire risk shall be separated from the surroundings by fire divisions.

Fire divisions shall be designed to resist dimensioning fire and explosion loads so that the main safety functions are maintained for a sufficient period of time, but always at least one hour. Penetrations shall not weaken fire divisions. Doors in fire divisions shall be of an automatic closing type.

Section 30

Fire divisions in living quarters

Living quarters shall be protected by fire divisions which at least fulfil fire class

- a) H-60 for outer walls facing a processing or drilling area and which may be exposed to fire from these,
- b) A-60 for all other outer walls,
- c) A-0 for outer walls of living quarters placed on a separate facility at safe distance from production or drilling facilities, and for outer walls of the emergency quarters of simpler facilities

with overnight stay possibility, if the emergency quarters are separated from the production or wellhead area with a main fire division corresponding at least to fire class H-0.

The interior design of living quarters shall be such that it reduces spreading of fire.

Section 31

Fire and gas detection systems

Facilities shall have a fire and gas detection system which ensures rapid and reliable detection of outbreak of fires, fires and gas leakages. The system shall be able to perform the intended functions independently of other systems.

In fire and gas detection, automatic actions shall limit the consequences of the fire or gas leakage. Placing of detectors shall be based on relevant scenarios, simulations and tests.

Section 32

Emergency shutdown systems

Facilities shall have an emergency shutdown system which is able to prevent situations of hazard and accident from developing and to limit the consequences of accidents, *cf. Section 7* on safety functions. The system shall be able to perform the intended functions independently of other systems.

The emergency shutdown system shall be designed so that it will go to or remain in a safe condition in the event of a failure which may prevent the functioning of the system. The emergency shutdown system shall have a simple and unambiguous command structure. The system shall be capable of being activated manually from release stations located at strategic places on the facility. It shall be possible to activate functions manually from the central control room so that the facility is brought to a safe condition in the event of failure in the programmable parts of the system.

Emergency shutdown valves shall be installed which are capable of stopping streams of hydrocarbons and chemicals to and from the facility, and which isolate the fire areas on the facility.

Section 33

Process safety systems

Facilities equipped with or connected to a processing plant shall have a process safety system. The system shall be able to perform the intended functions independently of other systems.

The process safety system shall be designed so that it will go to or remain in a safe condition in the event of a failure which may prevent the functioning of the system.

The process safety system shall be designed with two independent safety levels for protection of equipment.

Section 34

Gas release systems

Facilities equipped with or connected to a processing plant shall have a gas release system. The system shall prevent escalation of situations of hazard and accident by rapid reduction of the pressure in the equipment, and it shall be designed so that release of gas does not cause injury or harm to personnel or equipment.

The depressurisation shall be possible to activate manually from the central control room.

Liquid separators installed in the gas release system shall be secured against overfilling.

Section 35

Fire water supply

All facilities with overnight accommodation possibilities shall have sufficient fire water supply to fight fires and if necessary to dampen gas explosions.

Permanently manned facilities shall have fire water supply from fire pumps or other independent supply so that there is sufficient capacity at all times, even if parts of the supply are inoperative.

Simpler facilities with overnight accommodation possibility shall have fire water supply from fire pumps or other equivalently reliable supply. Simpler facilities without overnight accommodation possibility shall have the necessary fire water supply to enable protection of the personnel against fires that may occur when the facility is manned.

The fire water system shall be designed so that a pressure stroke does not make the system or parts of the system inoperative.

On facilities where fire water is supplied from fire pumps, the pumps shall start automatically when there is a pressure drop in the fire main and when fire detection has been confirmed. It shall in addition be possible to start fire pumps manually from the central control room and from the prime mover. The prime mover for fire pumps shall be equipped with two independent starting arrangements. Automatic disconnection devices shall be as few as possible.

Fire water piping shall be designed and located so as to ensure sufficient supply of fire water to every area on the facility.

Section 36

Fixed fire-fighting systems

Fixed fire-fighting systems shall be installed in hazardous areas and in other areas representing a major fire risk. The systems shall in addition cover equipment containing significant quantities of hydrocarbons. The systems shall be designed so that fire-fighting can take place quickly and efficiently at all times.

The systems shall be automatically activated on signal from the fire detection system. In the event of gas detection the systems shall be automatically activated if this can entail lower explosion pressure.

In areas where gas is used as extinguishing medium, warning systems shall be installed which give warning when gas is released.

Manual activation of fire-fighting systems shall activate the general alarm of the facility.

Section 37

Emergency power and emergency lighting

Facilities shall have a reliable, robust and simple emergency power system that will ensure sufficient power supply to equipment and systems that must function in the event of a main power failure.

In the changeover between main power and emergency power it shall be ensured that a cutting off does not entail operational problems to the emergency power consumers.

The emergency power system shall have as few automatic disconnection devices as possible in order to ensure continuous operation.

Facilities shall be equipped with emergency lighting which ensures necessary lighting of the facility if the main lighting fails.

Section 38

Ballasting systems

Mobile facilities shall be equipped with a system capable of ballasting any ballast tank under normal operational conditions.

In the event of unintentional flooding of any space adjacent to the sea it shall nevertheless be possible for ballasting to take place.

Ballasting systems shall be in accordance with the Norwegian Maritime Directorate's [regulations of 20 December 1991 No.879 concerning ballast systems on mobile offshore units](#), last amended 14 March 2008, Section 2 and Sections 7 to 22 inclusive.

Section 39

Open drainage systems

Facilities shall be equipped with open drainage systems capable of collecting and drain off oil and chemicals so that the risk of fire, injury to personnel and pollution is reduced.

The system shall be designed so that possible discharges of oil and chemicals will cause as little pollution to the marine environment as possible, and so that the requirements contained in the [Activities Regulations Chapter X-II](#) are fulfilled.

III-IV

EMERGENCY PREPAREDNESS

Section 40

Equipment for rescue of personnel

Facilities shall at all times have available equipment for quick and cautious rescue of personnel who fall into the sea, cf. also the [Activities Regulations Section 68](#) on handling of situations of hazard and accident. This equipment shall not subject the rescue personnel or the personnel to be rescued to unacceptable risk.

Diving facilities shall at all times have available equipment so that personnel in diving bells, submerged habitat and submersible crafts can be rescued in an emergency situation.

Section 41

Material for action against acute pollution

Material for action against acute pollution shall fulfil the requirements ensuing from the analyses mentioned in the [Management Regulations Section 15](#) on quantitative risk analyses and emergency preparedness analyses and [Section 16](#) on environmentally aimed risk and emergency preparedness analyses.

Facilities shall at all times have access to material that can be efficiently put to use in an action against acute pollution, cf. the [Framework Regulations Chapter III](#) on principles relating to health, environment and safety.

The material shall have been tested under realistic conditions with regard to functional and operative qualities and collection efficiency. The material shall be adapted to the physical and chemical properties of the pollution and to operative conditions at sea, along the coast and shore.

Weather, wind and current related efficiency figures shall be determined in respect of different types of material based on documented and relevant capacity figures.

Section 42

Standby vessels

The need for standby vessels and the requirements relating to the emergency response function of the vessels shall appear from the analyses mentioned in [Section 15 of the Management Regulations](#) on quantitative risk analyses and emergency preparedness analyses.

Standby vessels that are part of the management of and conduct of actions against acute pollution shall be designed so that they can carry out their functions at sea, near the coast and in the shore zone.

Section 43

Means of evacuation

It shall be possible to carry out quick and effective evacuation of personnel on facilities to a safe area in all weather conditions, cf. the [Activities Regulations Section 68](#) on handling of situations of hazard and accident litera d.

The choice of means of evacuation, their placing and protection shall be based on the defined situations of hazard and accident, cf. the [Activities Regulations Section 64](#) on establishing emergency preparedness.

As means of evacuation in respect of evacuation to sea, free-fall lifeboats supplemented by escape chutes and associated life rafts shall be used.

Separate assessments of the need for and selection of equipment for hyperbaric evacuation may be carried out. Hyperbaric evacuation units shall be designed so that they can be towed and lifted or in other ways be recovered from the water in the weather conditions relevant for the use of such evacuation units.

Section 44

Survival suits and life jackets etc.

It shall be possible to keep personal survival suits in the cabins. In addition there shall be placed a number of survival suits and life jackets within easy reach on the facility, based on the results from the emergency preparedness analysis mentioned in [Section 15 of the Management Regulations](#) on quantitative risk analyses and emergency preparedness analyses.

It shall be possible to store the survival suits and life jackets in such way that the quality is not deteriorated.

Life buoys shall be placed within easy reach on the facility.

Section 45

Manual fire-fighting and fireman's equipment

The facility shall be equipped with sufficient manual fire-fighting and fireman's equipment in order to ensure effective fire-fighting of outbreaks of fires and to prevent escalation.

III-V

ELECTRICAL INSTALLATIONS

Section 46

Electrical installations

Electrical installations shall be designed with safeguards and other protection so that abnormal conditions and failures that may entail a danger to the personnel and to the facility are avoided. The installations shall be designed with sufficient protection against, inter alia

- a) electric shock during normal operation and in the event of failure,
- b) thermal effects,
- c) overcurrent,
- d) fault currents,
- e) overvoltage,
- f) undervoltage,
- g) voltage and frequency variations,
- h) power supply failure,
- i) ignition of explosive gas atmosphere,
- j) electromagnetic interference,
- k) health injury from electromagnetic fields.

CHAPTER IV

SPECIFIC SUPPLEMENTARY PROVISIONS

**IV-1
DRILLING AND WELL SYSTEMS**

**Section 47
Well barriers**

Well barriers shall be designed such that the well integrity is ensured and the barrier functions are working as intended in the lifespan of the well.

Well barriers shall be designed so that unintentional well influx and outflow to the external environment is prevented, and so that they do not obstruct well activities.

When a well is temporarily and permanently abandoned, the barriers shall be designed so as to provide for well integrity for the longest period of time that the well is expected to be abandoned, inter alia so that outflow from the well or leakages to the external environment do not occur.

When a well is plugged, it shall be possible to cut the casing without harming the surroundings. Well barriers shall be designed so that their performance can be verified.

**Section 48
Well control equipment**

Well control equipment shall be designed and shall be capable of being activated so as to provide for barrier integrity as well as well control. In the case of drilling of top hole sections with riser or conductor, equipment with capacity to conduct shallow gas and formation fluid away from the facility until the personnel has been evacuated shall be installed.

Floating facilities shall have an alternative activation system for activating critical functions on the blow out preventer for use in the event of evacuation.

Floating facilities shall also have capacity to disconnect the lower marine riser package after the shear ram has cut the work string.

The pressure control equipment used in well interventions shall have remote control valves with mechanical locking devices in closed position. The well intervention equipment shall have a remote control blind/shear ram as close to the christmas tree as possible.

**Section 49
Compensator and disconnection systems**

Design of compensator systems shall be based on robust technical solutions so that failures do not lead to unacceptable consequences, cf. [Section 4](#) on design of facilities litera c.

Floating facilities shall be equipped with a disconnection system that secures the well and releases the riser before a critical angle occurs.

**Section 50
Drilling fluid system**

The drilling fluid system shall be designed so that it will mix, store, circulate and clean a sufficient volume of drilling fluid with the necessary properties to ensure the drilling fluid's drilling and barrier functions.

The high pressure part of the drilling fluid system with associated systems shall in addition have capacity and working pressure to be able to control the well pressure at all times.

**Section 51
Cementing unit**

The cementing unit shall be designed so that it will mix, store and deliver exact volume of cement with the necessary properties to ensure fully satisfactory anchoring and barrier integrity. The unit shall be designed so that remains of unmixed chemicals as well as ready-mixed cement are handled in accordance with the principles of the [Pollution Control Act](#).

If the cementing unit with associated systems is intended to function as backup for the drilling fluid system, it shall have capacity and working pressure to be able to control the well pressure at all times.

Section 52
Casings and anchoring of wells

This section no longer applies.

Section 53
Equipment for completion and controlled well flow

Equipment in the well and on the surface shall be designed to handle controlled well flow, cf. [section 11](#) on materials.

The well flow line and the annulus shall be equipped with necessary down hole safety valves (SCSSV) and with necessary equipment to monitor well parameters.

During well testing it shall at all times be possible to control the well flow through the work string and the choke manifold.

Section 54
Christmas tree and well head

Christmas trees and well heads shall be designed so as to provide for prudent production, re-entry, well intervention and well control.

The christmas tree shall have at least two main valves, and at least one of these shall be of an automatic type.

Section 55
Remote operation of pipes and work strings

Repealed.

See [section 70](#) on lifting appliances and lifting gear.

IV-II
PRODUCTION PLANTS

Section 56
Production plants

Production plants shall be designed so that the use of chemicals and energy is reduced, and so that the external environment is polluted as little as possible.

Production plants shall have a control system which provides a stable regulation of the plant.

Treatment systems for produced water shall be designed so that the oil content in each discharge stream is as low as possible, cf. the [Activities Regulations Section 55](#) on discharge of oil-contaminated water. The discharge point for produced water shall be placed so that the discharges will cause the least possible harm to the marine environment.

If there is a risk of ignition, the vessels in the system shall be designed so as to prevent air from entering.

Production plants also comprise sub sea production plants.

**IV-III
MAIN LOAD BEARING STRUCTURES AND PIPELINE SYSTEMS**

Section 57

Main load bearing structures

Main load bearing structures shall be designed so that single component failure or water penetration through outer walls facing the sea cannot lead to unacceptable consequences.

Section 58

Pipeline systems

Pipeline systems shall be designed so that internal maintenance can be carried out.

Launchers and receivers for cleaning and inspection tools (pigs) shall be designed so that they cannot be opened under pressure.

With regard to flexible pipeline systems and pipeline systems made of a material other than steel, usage factors and, if applicable, load and material factors shall be determined so as to ensure that the safety level for such systems is not lower than that of pipelines and risers made of steel.

**IV-IV
LIVING QUARTERS**

Section 59

Living quarters

The layout and capacity of living quarters shall ensure an fully satisfactory living environment and shall be adapted to the various functions to be provided for, and the anticipated need for personnel during the various phases of the petroleum activities.

The living quarters shall be equipped and furnished in such a manner so as to enable the maintenance of an adequate standard of hygiene therein.

Emergency quarters on simpler facilities with overnight accommodation shall be dimensioned to accommodate the maximum need for personnel. With regard to safety and standard of hygiene, the same requirements apply to simpler facilities with overnight accommodation as those applying to living quarters.

Section 60

Health department

Permanently manned facilities shall have a health department. It shall have the facilities required to enable the health personnel therein to perform adequately their duties.

Such a health department shall have the equipment required to provide first aid, and adequate medical treatment both on the installation and during the transport of patients.

It shall be possible to have telephone contact between the health department and a medical practitioner ashore. There shall be permanent means of internal communications between the health department and the manned control room. Such means of communication shall be capable of normal function in the event of general power failure.

In the event of power failure, the health department shall continue to have adequate working light therein, and at least two emergency power outlets, [cf. Section 37](#) on emergency power and emergency lighting.

On simpler facilities with overnight accommodation there shall be an adequately equipped first aid post.

Section 61

Emergency unit

Permanently manned facilities shall have an emergency unit in addition to a health department.

Treatment capacity of such an emergency unit shall be commensurate with the defined situations of hazard and accident as mentioned in the [Management Regulations Section 15](#) on quantitative risk analyses and emergency preparedness analyses.

The emergency unit shall be equipped in such a manner so as to provide adequate first aid and medical treatment.

Section 62 **Supply of food and drinking water**

Water supply of a facility is subject to the [regulations laid down by the Ministry of Health and Social Affairs](#).

The relevant facilities, such as the drinking water supply, shall be so designed that they fulfil the requirements mentioned in the [Activities Regulations Section 11](#) on food and drinking water. A facility shall have the necessary means of ensuring the quality of food and drinking water used on board.

IV-V **MARITIME INSTALLATIONS**

Section 63 **Stability**

Floating facilities shall be in accordance with the requirements contained in the Norwegian Maritime Directorate's [regulations of 20 December 1991 No. 878 concerning stability, watertight subdivision and watertight/weathertight closing means on mobile offshore units](#), last amended 14 March 2008, Sections 8 to 51 inclusive.

There shall be weight control systems on floating facilities, which shall ensure that weight, weight distribution and centre of gravity are within the design assumptions. Equipment and structural parts shall be secured against displacements that can affect stability.

Section 64 **Anchoring, mooring and positioning**

Floating facilities shall have systems to enable them to maintain their position at all times and, if necessary, be able to move away from the position in the event of a situation of hazard and accident.

The anchoring system shall be in accordance with the Norwegian Maritime Directorate's [regulations of 10 July 2009 No. 998 relating to positioning and anchoring systems on mobile offshore units \(the anchoring regulations 09\)](#) Sections 6 to 17 inclusive. Vertical forces as mentioned in the regulations Section 14 litera i, can be accepted in respect of some types of anchors, such as pile or suction anchors.

The mooring system shall be in accordance with the requirements of the Norwegian Maritime Directorate's [regulations of 10 February 1994 No. 123 for mobile offshore units with production plants and equipment](#), last amended 14 March 2008, Section 35.

Dynamic positioning systems shall be designed so that the position can be maintained in the event of defined failures and damage to the system and in case of accidents. Components and equipment shall be designed so that the total system fulfils the requirements to a specific equipment class, cf. the [Activities Regulations Section 81](#) on positioning.

Section 65 **Turret**

Turrets shall be designed so that they are in accordance with the requirements of the Norwegian Maritime Directorate's [regulations of 10 February 1994 No. 123 for mobile offshore units with production plants and equipment](#), last amended 14 March 2008, Section 15 subsections 1 to 4 inclusive.

IV-VI DIVING SYSTEMS

Section 66

Systems and equipment for manned underwater operations

Diving bells shall have an inside volume of at least 4.5 m³. If the diving bell is intended for more than two divers, there shall be an additional inside volume of 1.5 m³ per diver in excess of two.

Chamber complex for saturation diving shall have an inside height of at least 200 cm measured over the deck plates in the middle of the chamber. There shall be an inside volume of at least 4 m³ for each person.

It shall be possible to carry out a controlled disconnection of the umbilical for submerged habitat if the support vessel loses its position. In addition, it shall be easy to retrieve the umbilical so that necessary supplies to the submerged habitat can be re-established.

IV-VII OTHER SUPPLEMENTARY PROVISIONS

Section 67

Loading and discharging facilities

Loading and discharging facilities for oil and chemicals shall be designed so that the risk of pollution of the external environment is acceptable, cf. the [Management Regulations Section 6](#) on acceptance criteria for major accident risk and environmental risk.

Section 68

Waste

Facilities shall be designed so that waste can be collected, stored and treated fully satisfactorily with regard to health and environment, as mentioned in the [Activities Regulations Section 63](#) on waste.

Section 69

Exhaust ducts

Exhaust ducts for combustion products shall be placed and designed so that hot surfaces and sparks cannot ignite potential leakages of flammable fluids and gases, and so that flue gases do not inconvenience personnel, or create dangerous situations for helicopter traffic.

Vents from atmospheric tanks and containers shall be placed and designed so that discharge of toxic or flammable gases will not entail increased risk to the personnel or the facility.

Section 70

Lifting appliances and lifting gear

Lifting appliances and lifting gear on facilities shall be designed based on the conditions under which the lifting gear and lifting appliances are to be used, cf. [Section 12](#) on handling of materials and transport routes, access and evacuation routes. A corresponding requirement applies to the safety of lifting appliances and lifting gear on vessels participating in the petroleum activities.

In the choice of lifting appliances and lifting gear on floating facilities, particular consideration shall be given to the movements of the facility.

Drilling and well areas, storage area included, shall be equipped for remote operation of pipes and work strings. The requirement to remote operation of pipes and work strings in the storage area applies from the pipes have been laid out on pipe deck and made ready for further transport to drill floor or work deck.

The requirement with regard to such remote operation of pipes and work strings is also applicable to lightweight rigs and snubbing units.

Section 71

Helicopter decks

Helicopter decks shall be designed and equipped so that they fulfil the requirements of the Civil Aviation Authority's [regulations of 26 October 2007 No. 1181 relating to continental shelf aviation – commercial air transport to and from helidecks on facilities and vessels at sea](#), last amended 28 January 2008.

Fire-fighting equipment on helicopter decks shall be designed and placed so that

- a) fires on the helicopter deck, on as well as inside helicopters, can be fought safely and effectively,
- b) rescue personnel and other personnel are protected during evacuation of helicopters.

The helicopter deck shall be equipped with one fire-fighting station at each access way.

Section 72

Marking of facilities

Facilities shall be marked so that they can be quickly identified and so that other traffic in the area is warned. Marking of facilities shall be in accordance with the provisions of the Coast Directorate.

The anchor and marker buoys shall be marked in a corresponding manner.

All navigation marks placed at sea in connection with the petroleum activities shall be in accordance with the IALA rules and of a type accepted by the Coast Directorate for such marking. When anchor points are placed outside the safety zone, the Petroleum Safety Authority may require them to be marked with yellow anchor buoys with yellow reflectors, if applicable with yellow flashing light.

Section 73

Marking of equipment and cargo

Cargo and equipment which is transported, or which is used for transport to or from facilities or vessels taking part in the petroleum activities, shall be clearly marked with the name of the owner, facility or vessel.

Section 74

Lifts

Lifts shall be designed based on the conditions under which they are to be used, and so that transport of personnel and materials can take place effectively and safely, [cf. Section 12](#) on handling of materials and transport routes, access and evacuation routes.

CHAPTER V IMPLEMENTATION OF EEA LAW

Section 75

Simple pressure vessels

Simple pressure vessels as defined in [regulations of 7 July 1994 relating to simple pressure vessels](#) (the SPV Regulations), last amended 6 November 2003, shall be in accordance with the requirements of the SPV Regulations, also when such vessels are used in the petroleum activities.

Section 76

Personal protective equipment

Personal protective equipment as defined in [regulations of 19 August 1994 No. 819 relating to construction, design and production of personal protective equipment](#) (the PPE Regulations), last amended 20 February 2004, shall be in accordance with the requirements of the PPE Regulations, also when such equipment is used in the petroleum activities.

An exception to this provision is the [PPE Regulations](#) Section 49 subsection 2 on diving equipment.

Section 77

Aerosols

Aerosols as defined in [regulations of 1 March 1996 No. 229 relating to aerosols](#) (the Aerosol Regulations), last amended 6 November 2003, shall be in accordance with the requirements of the Aerosol Regulations, also when such aerosols are used in the petroleum activities.

Section 78

EMC

Electrical appliances comprised by regulations of 31 October 2008 No. 1164 relating to electrical equipment (the EE Regulations), and which are used in the petroleum activities, shall be in accordance with the requirements of the EE Regulations as regards electromagnetic compatibility, with the exception of section 5 on notification duty.

Appliances and fixed installations comprised by the Norwegian Post and Telecommunications Authority's regulations of 22 January 2007 No. 89 relating to electromagnetic compatibility (EMC) for electronic communication shall be in accordance with the requirements of these regulations, also when such equipment is used in the petroleum activities.

Section 79

Ex-equipment

This section no longer applies.

Section 80

ATEX

Equipment and safety systems for use in explosive areas as defined in [regulations of 9 December 1996 No. 1242 relating to equipment and safety systems for use in explosive areas](#) (the ATEX Regulations), last amended 8 December 2003, shall be in accordance with the requirements of the ATEX Regulations, also when such equipment is used in the petroleum activities, with the exception following from the [ATEX Regulations](#) Section 1 fourth paragraph fifth item.

Section 81

Pressure equipment not comprised by the Facilities Regulations

These regulations do not apply to pressure equipment comprised by [regulations of 9 June 1999 No. 721 relating to pressure equipment](#), last amended 10 July 2002.

Section 82

Machinery and safety components not comprised by the Facilities Regulations

These regulations do not apply to products comprised by [regulations 20 May 2009 No. 544 relating to machinery \(the machinery regulations\)](#).

**CHAPTER VI
ENTRY INTO FORCE**

Section 83

Entry into force

- 1) These regulations enter into force 1 January 2002.
- 2) In the areas of health, working environment and safety, technical requirements in regulations that applied up to the time of entry into force of these regulations, may be used for existing facilities.
- 3) In the case of major rebuildings and modifications of existing facilities these regulations shall nevertheless apply to that which is comprised by the rebuilding and modification.
- 4) Requirements to instrumentation for aviation weather service as mentioned in [section 16](#) on instrumentation for monitoring and recording, enter into force 1 January 2008.
- 5) Requirements to helicopter decks as mentioned in [section 71](#) on helicopter decks, cf. the Civil Aviation Authority's [regulations of 26 October 2007 No. 1181 relating to continental shelf aviation – commercial air transport to and from helidecks on facilities and vessels at sea](#) chapters IV and V, do not apply to facilities built before 1 June 1993. The requirement in [said regulations](#) section 10 on size of helidecks, does not apply to facilities built before 1 January 2008.