

GUIDELINES REGARDING THE TECHNICAL AND OPERATIONAL REGULATIONS

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CHAPTER I INTRODUCTORY PROVISIONS

Re Section 1 Scope

These regulations have a limited scope in relation to the [Framework Regulations](#). The regulations are limited to apply to activities at onshore facilities, and they do not regulate the Climate and Pollution Agency's area of responsibility. As regards health related matters, the regulations apply to onshore facilities covered by the [Petroleum Act](#), cf. [Section 2](#) and [Section 16, third subsection of the Framework Regulations](#).

The regulations stipulated by the Directorate for Civil Protection and Emergency Planning (DSB) and the Norwegian Labour Inspection Authority also apply to onshore facilities covered by these regulations. This typically regards regulations that do not govern "the core activities" of the petroleum activities, and which there is no need to specifically regulate in petroleum regulations. This ensures that the industry is subject to corresponding requirements in different authorities' areas of responsibility, to the extent possible. In addition, regulations stipulated by Royal Decree or by the ministries within the regulations' enabling acts, apply. A reference list at the end of the guidelines provides an overview of the key regulations that apply to onshore facilities in addition to the Technical and Operational Regulations.

Special rules for the onshore facilities are included in these regulations, which will apply instead of some of the Norwegian Labour Inspection Authority's and DSB's regulations. The regulations that do not apply, are therefore exempt, see Section 4 with Guidelines.

DSB and the Norwegian Labour Inspection Authority have prepared several guidelines for their regulations, which, in addition to these guidelines, can also be used as a basis for understanding and fulfilment of requirements in the Technical and Operational Regulations, unless the guidelines belong to regulations that are exempt for the petroleum activities. In particular, this is of significance for the part of the industry that carries out services across the various areas of authority.

Re Section 2 Responsibilities

No comments.

Re Section 3 Definitions

Definitions and abbreviated forms that follow from the [Framework Regulations](#) are not repeated in these guidelines. These guidelines clarify or provide supplementary information for definitions as mentioned in this section.

Main areas can be

- a) process area
- b) auxiliary plant
- c) tank area
- d) pipe trenches
- e) flares
- f) control rooms
- g) manned buildings in general (workshop, laboratory, fire station, administration buildings)
- h) unmanned buildings (substations, analyser building, warehouse)
- i) quays
- j) vehicle loading/offloading areas
- k) parking lots
- l) temporary office buildings, containers, etc.

Safety functions can be

- a) process sectionings
- b) fire detection,
- c) gas detection,
- d) ignition source disconnection,
- e) maintaining overpressure in unclassified rooms,

- f) starting and stopping fire pumps, both manually and automatically,
- g) active fire-fighting
- h) active smoke control,
- i) securing processes,
- j) depressurisation,
- k) general alarm and evacuation alarm,
- l) production and distribution of emergency power,
- m) emergency lighting.

Re Section 4

Regulations stipulated by other authorities

Regulations listed in Section 4 are exempt and replaced by special rules through these regulations. However, some of these regulations are referenced as standards in these guidelines. An overview of key HSE regulations and their application in the scope of these regulations, can be found in the reference list. Reference is also made to [Section 24 of the Framework Regulations](#).

CHAPTER II

GENERAL PROVISIONS FOR DESIGNING ONSHORE FACILITIES

Re Section 5

Choice of development concept

When choosing a development concept, the following should be considered:

- litera a: important contributors to risk, cf. Sections 4 and 17 of the Management Regulations,
- litera b: organisation, manning, maintenance, transport solutions, working environment, manned underwater operations, if applicable,
- litera c: infrastructure, neighbour relations, agriculture, aquaculture and shipping lanes,
- litera d: topography conditions, ground conditions, weather conditions, harbour conditions, vegetation, ground water level,
- litera e: delivery commitments and finances,
- litera f: flexibility and expected changed operating conditions, as well as future use,
- litera g: removal and reuse.

The need for qualification of new technology, cf. Section 9, should also be considered.

Re Section 6

Design of onshore facilities

For general risk reduction requirements, see [Section 11 of the Framework Regulations](#), and Chapters II and V of the Management Regulations.

As regards design of work sites and workplaces, reference is made to the Regulations relating to work sites and workplaces.

To fulfil the requirements related to design as mentioned in the first subsection, the facility should be designed such that the probability and consequences of accidents are reduced by having areas, equipment and functions arranged, located and oriented such that, to the extent possible,

- a) the possibility of collection and spread of hazardous substances is limited,
- b) the probability of ignition is limited,
- c) areas that contain hazardous substances are separated from each other and from other areas, and
- d) consequences and escalation of fires and explosions are reduced.

The facility should be divided into main areas according to their function, and should use distance to separate high risk areas from areas with low risk, as well as the personnel's regular work sites.

Risk analyses as mentioned in Chapter V of the Management Regulations and land-use plans as mentioned in the second subsection, should be used as a basis for placement and design of equipment and installations, and establishment of area restrictions surrounding onshore facilities.

As regards pipeline systems, the land-use plan should show the route, placement of buildings and facilities that are part of the system, transport concepts for both the construction and operations phases and any other area interventions.

In order to fulfil the requirement for a strategy as mentioned in the second subsection, the NS-EN ISO 13702 standard, Chapter 4 should be used.

The requirement for measures as mentioned in the last subsection, can be fulfilled using both technical and operational measures.

As regards classification of explosive areas, IEC 60079-10-1 and IP 15 should be used.

Re Section 7

Installations, systems and equipment

Reference is made to the NS-ISO 11064 standard as regards human errors.

As regards marking requirements as mentioned in the second subsection, reference is made to Section 11 of the Regulations relating to handling of hazardous substances, with the following addition: main components of the facilities should be marked with function, and pipe installations should be marked with relevant content and direction of flow.

In cavern installations where the ground water level ensures a barrier against leakage of stored substances, the ground water level above the cavern should correspond to the substance's vapour pressure at the storage temperature plus a 20-metre water column as security against structural defects in the rock.

For design of quays, reference is made to the Regulations relating to harbour work.

See also Section 6.

Re Section 8

Materials

When selecting materials with regard to technical fire qualities as mentioned in litera d, non-flammable materials should be chosen. In those cases where flammable materials are nevertheless used, such materials should have limited ability to spread flames, develop little smoke and heat and have a low level of toxicity. In areas for accommodation, electrical installations should be made from halogen-free materials. The flame spread and smoke development qualities of the materials should be considered when textiles or surface treatment with paint or other coating is used.

When choosing materials with regard to the employees' health and working environment as mentioned in litera g, materials should be used that neither alone nor in combination with other materials or gases are harmful to the employees. When choosing materials and surfaces, emphasis should be placed on comprehensive solutions adapted to the intended use and cleaning and maintenance requirements.

Re Section 9

Qualification and use of new technology and new methods

New technology as mentioned in the first subsection, can be new products, analysis tools or known products used in a new way.

Qualification as mentioned in the second subsection, includes investigation and provision of objective evidence that the needs are satisfied with respect to a specific, intended use, cf. Section 21 of the Management Regulations.

The methodology, the procedures and the equipment that will be used in the qualification, should also be used in the further work.

Re Section 10

Safety functions

Safety functions are defined in Section 3.

As regards the choice and design of safety functions as mentioned in the first subsection, the NS-EN ISO 13702 standard should be used. To stipulate the performance for instrumented safety functions as mentioned in the second subsection, the IEC 61508 and 61511 standards should be used.

The safety functions as mentioned in the first subsection, form part of the barriers against accident and hazard situations as mentioned in Sections 4 and 5 of the Management Regulations.

To ensure that the safety functions are always able to safeguard their functions as mentioned in the first subsection, they should be designed such that they can be tested and maintained without impairing the functions' performance. As regards disconnection of safety functions, see Section 42 of these regulations.

CHAPTER III DESIGN OF AREAS, INSTALLATIONS, SYSTEMS AND EQUIPMENT

Re Section 11

Materials handling and transport routes, access and evacuation routes

Stairs, doors and hatches, etc. are also included in the terms access, transport and escape routes.

When designing for handling of materials and personnel traffic as mentioned in the first subsection, account should be taken, inter alia, of the following:

- a) the need for, type and quantity of lifting and transport appliances, including cranes and lifts,
- b) the need for loading and unloading areas, provision for forklifts, trolleys, etc.,
- c) access to areas and workplaces in connection with operations and maintenance,
- d) safe handling of loads.

The various work sites should be designed so that they can be serviced and maintained without the use of temporary equipment such as scaffolding, ladders, etc. As a permanent solution, stepladders should be selected in favour of vertical ladders.

Escape routes as mentioned in the third subsection, should have a satisfactory guiding system.

As a recommended standard for lifting operations, [NORSOK R-005](#) Safe use of lifting and transport equipment at onshore petroleum facilities, should be used.

As regards design of scaffolding, the Regulations relating to scaffolding, ladders, etc. should be used.

Re Section 12

Lifting appliances, lifting gear and equipment for personnel transport

See also Section 62.

As a recommended standard for lifting operations, [NORSOK R-005](#) Safe use of lifting and transport equipment at onshore petroleum facilities, should be used.

Re Section 13

Safety signs

No comments.

Re Section 14

Pipeline systems

As regards the design of pipeline systems, ISO 13623 and DNV-OS-F101 Appendix F should be used, with the following addition: The pipeline system should be laid and designed such that the risk of fire, explosion and other unintended incidents is minimised, and such that the surroundings are affected as little as possible. Distances between pipelines, associated equipment and the surroundings shall be evaluated based on the content's properties, temperature and pressure. The distanced should be dimensioned based on the risk of undesirable incidents such as fire, explosion or spread as a result of emissions/discharges.

The pipeline system should be marked such that its location in the terrain is clearly visible. The parts of the pipeline system that are not covered should be secured so that they are not accessible to unauthorised personnel.

The pressure in the chambers as mentioned in the second subsection, should be possible to read both before start-up and during operation.

For general requirements related to design, see Sections 6, 7, 8 and 20.

Re Section 15 **Electrical installations**

Protection against health hazard as a result of electromagnetic fields as mentioned in litera k, is regulated separately in Section 26 of the Radiation Protection Regulations.

As regards design of electrical installations and electrical equipment, reference is made to the following regulations:

- a) Regulations relating to low voltage electrical installations,
- b) Regulations relating to maritime electrical installations, and
- c) Regulations relating to electrical equipment.

In addition, the Regulations relating to electrical supply installations and standards designated in NEK 400 Electrical low voltage installations, NEK 420 Electrical installations in explosive areas with gas and dust and NEK 440 Station facilities exceeding 1 kV should be used.

Re Section 16 **Drainage systems**

The requirement for drainage systems entails e.g.

- a) that, in addition to handling of the actual fuel leak, there is sufficient capacity to drain water that gathers in the installation during precipitation and during fire-fighting,
- b) that any oily surface water is cleaned out before discharge,
- c) that the collection system has a shutdown device,
- d) that tank drain valves are located and sheltered such that they can be operated in the event of fire,
- e) that drainage, including the drainage system, is carried out such that it is not obstructed by the formation of ice, foreign bodies, etc., and
- f) that the bottom of the collection system slopes towards the drainage opening.

Re Section 17 **Exhaust ducts**

Exhaust ducts should be designed such that the exhaust gases are routed to unclassified areas.

Re Section 18 **Accommodation**

The capacity requirement as mentioned in the second subsection, means that the living quarters are dimensioned with sufficient margins to avoid bed scarcity during peak manning. The accommodation should be designed such that personnel can sleep undisturbed and be assured of satisfactory restitution.

Particular attention should be given to prudent hygienic standards in bedrooms, dayrooms and areas where food is stored, prepared and served, cf. also the Guidelines regarding Section 68.

Reference is also made to the Regulations relating to environmental public health service.

Re Section 19 **Ventilation and indoor climate**

To fulfil the requirement for **ventilation** as mentioned in the first subsection, the NS A ISO 15138 standard together with the IEC 60079-10-1 and IEC 60079-13 standards should be used, with the following addition: when determining the need for air exchange, the danger of accumulation of hazardous and flammable gas and the need for weather protection should all be taken into account, cf. Section 24 of these regulations.

The requirements for **indoor climate** as mentioned in the second subsection, apply to indoor work areas.

The requirements entail that consideration is taken for the fact that the air quality is influenced by building materials and fixtures, personnel, activities and processes, cleaning and maintenance. In order to fulfil these requirements, the following should be used:

- a) the Norwegian Labour Inspection Authority's guidelines regarding climate and air quality at work and
- b) the National Institute for Public Health – recommended technical standards for indoor climate.

Requirements for ventilation and indoor climate shall be seen in the context of Section 20.

Reference is also made to the Regulations relating to environmental public health service.

Re Section 20
Chemicals and chemical exposure

Under normal operations, the concentration of hazardous materials in the work atmosphere, as well as skin contact with such chemicals, shall be as low as is reasonably possible. This means that onshore facilities should be designed with a safety factor in relation to the Norwegian Labour Inspection Authority's administrative standards for pollution in work atmospheres.

This section covers technical provisions to reduce acute and prolonged chemical influences related to transport, transfer, use and disposal of chemicals. The section also includes processes that produce chemical components.

For use of chemicals, see Section 48 of these regulations.

For design and placement as regards fire and explosion hazard as mentioned in the second subsection, litera c, reference is made to Section 29 of these regulations.

Re Section 21
Human-machine interface and information presentation

During design as mentioned in the first subsection, an analysis of the human-machine interface, including necessary task and function analyses, should be carried out. For such analyses, Part 2 of the NS-EN 614 standard should be used.

The NS-EN ISO 11064 standard should be used for design of the central control room.

In order to fulfil the requirement for information as mentioned in the second subsection, Part 1 of the NS-EN 614 standard and Parts 1 through 3 of the EN 894 standard should be used, with the following addition: the information should be suitably structured and consistent with regard to the use of colour, text and symbols.

The design of alarms as mentioned in the third paragraph, should be such that

- a) alarms that are presented, are easy to register and understand, and clearly show where possible deviations and dangerous situations have arisen,
- b) the alarms are coded, categorised and assigned priority based on the safety significance of the alarms and how quickly personnel shall react in order to avoid undesirable consequences,
- c) alarm systems provide for suppressing and reducing alarms, so as to avoid mental stress on the part of control room personnel during interruptions in operations and accident incidents.

Re Section 22
Communication systems and equipment

In order to fulfil the requirement for communication systems as mentioned in the first subsection,

- a) two-way communication systems or internal radio communication should be used where necessary to communicate important information or to quickly achieve contact with personnel,
- b) speaker systems that can provide notifications to strategic locations on onshore facilities should be used, so that all personnel can be notified regarding hazard and accident situations, see also Section 67. The central control room should be given priority to send messages via the PA system.

Protection as mentioned in the second subsection, means e.g. that the equipment shall be located such that communication is not interrupted.

The requirement for alarm systems as mentioned in the third subsection, entails that the general alarm and evacuation alarm can be activated from the central control room. Alarm systems include both audio and visual signals.

CHAPTER IV

WORKING ENVIRONMENT FACTORS IN THE DESIGN OF ONSHORE FACILITIES

Re Section 23 **Ergonomic design**

As regards ergonomic design, reference is also made to the Norwegian Labour Inspection Authority's guidelines regarding organisation and arrangement of work – guidelines for Sections 4-1 through 4-4 of the Working Environment Act.

To fulfil the requirements for design, the ISO 6385 standard should be used. In addition, there should be

- a) easy and safe access for operation, inspection, reading and maintenance,
- b) possibility to operate outdoor handles, switches, etc. wearing gloves.

As regards monitor workstations, see Sections 21 and 48 of these regulations.

Re Section 24 **Outdoor work areas**

Risks as mentioned in the second subsection, can include accumulation of flammable gases, hazard of increased explosion pressure and potentially reduced access for fire-fighting.

With regard to new constructions and modifications, weather protection requirements should be specified at an early point in time.

Re Section 25 **Noise and acoustics**

When planning the design of onshore facilities, it should be taken into account that the use of hearing protection is not an adequate measure to fulfil the noise requirement, cf. Section 48 of these regulations.

The highest permissible noise limit (95 dB(A)) should only be allowed in connection with brief inspections or work tasks that are to be carried out in an area where there is no passage through to other areas. Provisions should be made for noise-deflection of noisy equipment when maintenance or other work is carried out in the area, cf. Section 46 of these regulations.

Re Section 26 **Vibrations**

In order to assess the reaction of human beings to low-frequency vibrations, the NS 4931 standard should be used.

Re Section 27 **Lighting**

Lighting as mentioned in the first subsection, can be artificial lighting, daylight or direct sunlight. The lighting should be especially good and proper in the control room, cabins and other rooms where sight-intensive work takes place, where display screen equipment is used on a regular basis and where the work requires good visibility during various weather conditions. There should also be specific lighting if the general lighting is not adequate for readings, service and maintenance.

Re Section 28 **Radiation**

Radiation as mentioned in the first subsection, means ionising and non-ionising radiation.

CHAPTER V

FIRE AND EXPLOSION PROTECTION IN THE DESIGN OF ONSHORE FACILITIES

Re Section 29

Hazardous materials and explosives

To assess and select measures to prevent or reduce the risk of fire and explosion, relevant parts of ISO 13702 (Chapter 7, Annexes A and B, Table C2) and EN 1127-1 should be used.

As regards marking, handling and storage of hazardous substances, the Regulations relating to handling of hazardous substances, should be used.

As regards marking and storage of explosives, reference is made to the Regulations relating to explosive substances, in particular Sections 2-7, 2-8 and Chapter 7.

Re Section 30

Passive fire protection

As regards stipulation of fire loads from a design fire load as mentioned in the first subsection, see Section 6, litera a.

Adequate fire resistance as mentioned in the first subsection, should be stipulated in relation to recognised standards or calculation models. When stipulating fire resistance for load-bearing structures, varying material utilisation can be taken into account.

As regards gas and liquid-filled vessels and pipe sections, the passive fire protection should be sufficient to prevent rupture before depressurisation is carried out.

Re Section 31

Fire divisions

Fire divisions with coated or sprayed-on fire protection material that does not fulfil the requirements for incombustibility, can be used if an overall assessment indicates that this is prudent from a safety point of view, cf. Section 8.

Examples of penetrations in fire divisions as mentioned in the third subsection, can include ventilation ducts, pipes, cables and beams, as well as windows and doors.

As regards fire requirements for physical fire divisions, the ISO 834 standard should be used.

Re Section 32

Fire and gas detection system

As regards the design of the system as mentioned in the first subsection, Chapter 10 of the NS-EN ISO 13702 standard as well as Attachment B.6 should be used.

The requirement for independence as mentioned in the first subsection, implies that the fire and gas detection system comes in addition to systems for management and control and other safety systems. The fire and gas detection system can have an interface with other systems as long as it cannot be adversely affected as a consequence of system failures, failures or individual incidents in these systems.

The requirement regarding limiting the consequences as mentioned in the second subsection, entails that relevant safety functions shall be activated.

Re Section 33

Emergency shutdown system

As regards the design of the emergency shutdown system, Chapters 6 and 7 of the NS-EN ISO 13702 standard, as well as Attachments B.2 and B.3 should be used.

The requirement for independence as mentioned in the first subsection, implies that the fire and gas detection system comes in addition to systems for management and control and other safety systems. The emergency shutdown system can interface vis-à-vis other systems if it cannot be adversely affected as a consequence of system failures, failures or individual incidents in these systems.

An unambiguous command structure as mentioned in the second subsection, means that the flow of signals and command hierarchy is clearly stated. The requirement to be able to activate functions manually in

the event of failure in the programmable parts of the system, implies that the activation of the functions shall be functionally designed and physically different from the programmable parts of the system.

The requirement for shutdown and isolation as mentioned in the third subsection, entails that sectioning valves in the process facility and isolation valves towards pipeline systems shall normally be emergency shutdown valves.

The number and placing of sectioning valves in the processing plant should be determined on the basis of the fire and explosion strategy, cf. Section 6.

The emergency shutdown system should be verified in accordance with the safety integrity levels set based on the IEC 61508 and 61511 standards. As regards facilities that are not covered by this standard, the operability should be verified through a full-scale function test at least once each year. The test should cover all parts of the safety function, including closing of valves. The test should also include measurement of interior leakage through closed valves. Recording of the plant's or equipment's functionality in situations where the function is triggered or put to use, can replace testing of the installation or the equipment.

Re Section 34

Process safety systems

The requirement for independence as mentioned in the first subsection, implies that the fire and gas detection system comes in addition to systems for management and control and other safety systems. The process safety system can interface with other systems if it is not adversely affected as a consequence of system failures, failures or individual incidents in these systems.

Process safety functions should be identified and implemented using a systematic approach based on an established risk-based methodology.

The requirement for two independent safety levels as mentioned in the third subsection, implies that the process safety levels shall be protected against dependent failures, so that a single failure does not lead to the failure of both safety levels. For example, the overpressure protection should consist of two independent protection levels, of which one is normally a pressure safety valve (PSV).

The overpressure protection should be designed in accordance with API RP 520/ISO 4126 and API 521/ISO 23251.

As regards instrumented/electronic safety functions, the IEC 61508 and 61511 standards should be used.

Re Section 35

Depressurisation and flare system

The requirement for a depressurisation and flare system as mentioned in the first subsection, entails that combustible or hazardous gases shall be directed to a safe emission location, and that any heat load shall be calculated.

To fulfil the requirement for depressurisation and flare systems as mentioned in the first subsection, Chapter 6 of the NS-EN ISO 13702 standard as well as Attachment B.2, and the ISO 23251 standard should be used, with the following additions:

- a) fire protection,
- b) when designing depressurisation and flare systems, external environment considerations should be safeguarded by preferably flaring flammable, toxic or corrosive gases.

In addition to manual activation as mentioned in the second subsection, activation signals can also come from relevant safety systems such as the emergency shutdown system.

Re Section 36

Firewater supply

Sufficient firewater supply as mentioned in the first subsection, means the quantity necessary to supply all fire-fighting equipment in the onshore facility's largest fire area with one fire pump out of operation and necessary additional capacity to ensure that the fire does not spread to other adjacent areas in accordance with the chosen strategy.

To fulfil the requirements in the second, third and fourth subsections, Chapter 11 of the NS-EN ISO 13702 standard, as well as Attachment B.8, should be used.

In cases where firewater is supplied from fire pumps, the pumps should start automatically in the event of a pressure drop in the fire main and upon confirmed fire detection.

Re Section 37

Fire-fighting equipment and systems for fire-fighting

To fulfil the requirement for depressurisation and flare systems as mentioned in the first subsection, Chapter 11 of the NS-EN ISO 13702 standard as well as Attachment B.8, and the ISO 23251 standard should be used, with the following additions:

- a) The risk represented by other potential fires should be reduced to the extent possible,
- b) CO₂ as an extinguishant should not be used in rooms where personnel can be present,
- c) in areas where strong winds can occur, this should be taken into account when placing nozzles and in relation to the need for increased capacity,
- d) water mist systems can be installed if realistic tests have been carried out showing that the system fulfils its planned function,
- e) as regards fire-fighting in engine rooms for diesel engines, particular consideration should be given to pumps and pipes in the fuel unit, and separate spot protection should be installed, if applicable,
- f) in the event of equal fire solutions, the one that utilises the least environmentally harmful extinguishant, should be selected, cf. Section 3a of the Product Control Act.

To fulfil the requirements for manual fire-fighting and fire-fighter equipment as mentioned in the second subsection, Attachment B.8.12 to standard NS-EN ISO 13702 should be used.

Re Section 38

Emergency power and emergency lighting

To fulfil the requirement for emergency power, Chapter 9 of the NS-EN ISO 13702 standard, as well as Attachment C.1, should be used.

For design of emergency lighting as mentioned in the last paragraph, the EN 1838 standard should be used. There should be emergency lighting in those areas where personnel can be located in an accident and hazard situation. The emergency lighting should contribute to ensure evacuation, and indicate the location of manual fire-fighting equipment and other safety equipment. The emergency lighting should be connected to the emergency power system or have its own battery power source.

CHAPTER VI

GENERAL PROVISIONS FOR CONDUCTING ACTIVITIES

Re Section 39

Installation and commissioning

Commissioning as mentioned in the second subsection entails e.g. that safety systems shall be function tested.

Re Section 40

Start-up and operation of onshore facilities

The operational organisation as mentioned in the second subsection, litera a, also means the emergency preparedness organisation.

Governing documents as mentioned in the second subsection, litera b, also mean the guidelines, procedures, plans and programmes that are prepared according to these regulations and the Management Regulations.

Re Section 41

Use of onshore facilities

Limitations for use as mentioned in the first subsection can ensue from the loads that the facility and its individual parts shall be able to withstand, cf. Section 11 of the Facilities Regulations. The loads can include chemical loads, environmental loads such as wind and temperature and functional loads such as pressure, weight, temperature and vibration.

Status as mentioned in the second subsection means, inter alia, the backlog of preventive maintenance and the outstanding corrective maintenance.

Re Section 42 Safety systems

Measures and limitations can be activity limitations, full shutdown or other measures that compensate for the impairment of safety functions that follows from overriding or interruption.

Re Section 43 Critical activities

Critical activities can be

- a) work on pressurised, electrified or hydrocarbon service systems,
- b) hot work,
- c) work with explosives or substances that can self-ignite,
- d) work on radioactive sources,
- e) work that entails risk of acute pollution,
- f) work that entails disconnection of safety systems,
- g) lifting operations, cf. Section 62.

When identifying important contributors to risk, one should, inter alia, use the results from the risk analyses performed and experience from hazard and accident situations.

The limitations can be requirements for implementing compensatory measures in connection with executing an activity, or duration or frequency limitations for executing a special type of activity.

Re Section 44 Simultaneous activities

Activities as mentioned in the second subsection can be production, maintenance and modification activities, including activities as mentioned in Section 43.

Measures as mentioned in the second subsection can be limitations or prohibitions that are to be implemented in connection with certain types of simultaneous activities during startup, operation and shutdown.

In connection with executing activities as mentioned in the second subsection, the effect of mutual dependence between different activities should, inter alia, be taken into account.

Re Section 45 Procedures

Procedure as mentioned in the first subsection means a specified way of conducting an activity or a process.

The formulation of procedures as mentioned in the second subsection, should be unambiguous, user-friendly and adapted to the users' competence.

The users of the procedures should take part in the formulation and revision of such procedures. The procedures should be tested before use to check design and contents with regard to the intended functions.

Re Section 46 Organisation of work

As regards organisation of work, reference is also made to the Norwegian Labour Inspection Authority's guidelines regarding organisation and arrangement of work – guidelines for Sections 4-1 through 4-4 of the Working Environment Act.

The organisation as mentioned in the first subsection, should, inter alia, take into account the need for individual adaptation, including work capacity and age. Cf. also Section 21 and Chapters II and III of these regulations, and Sections 18 and 19 of the Management Regulations.

Hazardous exposure and unfortunate loads as mentioned in first subsection, mean exposure and loads that result from ergonomic conditions, chemical influences, radiation, noise, vibrations, climatic conditions and psychosocial conditions.

To avoid hazardous exposure as mentioned in the first subsection, measures or solutions should be selected at the highest of these levels:

- a) elimination of the causes of the exposure,
- b) technical measures that reduce the probability of exposure,
- c) technical measures that reduce exposure,
- d) operational measures that reduce exposure.

Organisation as mentioned in the first and second subsections, should be a continuous process where both employer and the employees attempt to improve the working environment, cf. also Section 23 of the Management Regulations.

Organisation of work should be based on accessible knowledge of the characteristics and needs of humans, so that the interaction between people, technology and organisation is optimised, cf. Section 13 of the Management Regulations. The ISO 6385 standard should be used in such organisation.

As regards work in tanks, the Regulations relating to work in tanks should be used.

Re Section 47 Psychosocial aspects

Aspects as mentioned in the first sentence, can be

- a) requirements relating to efficiency and workload in relation to the resources available for conducting the work tasks,
- b) the work's complexity in relation to competence and resources,
- c) opportunities for variation and stimulation in the job,
- d) opportunities for independence and influencing important decisions,
- e) opportunities for career development and utilisation of own competence,
- f) climate of cooperation, handling of disagreements, conflicts and harassment,
- g) work management, including feedback and follow-up in the daily work,
- h) night work and working alone.

In addition, reference is made to the Norwegian Labour Inspection Authority's guidelines regarding organisation and arrangement of work – guidelines for Sections 4-1 through 4-4 of the Working Environment Act.

Re Section 48 Physical and chemical working environment

In addition, the Norwegian Labour Inspection Authority's

- a) administrative standards for pollution of work atmosphere,
- b) Orientation relating to production and use of polyurethane products (isocyanates), and
- c) guidelines regarding organisation and arrangement of work – guidelines for Sections 4-1 through 4-4 of the Working Environment Act, should be used.

Radiation as mentioned in fourth subsection, means ionising and non-ionising radiation. Handling also means handling during hazard and accident situations.

To fulfil the requirement for avoiding exposure, the Norwegian Radiation Protection Authority's

- a) Radiation Protection Regulations,
- b) Guideline 1 relating to industrial radiography, and
- c) Guideline 9 relating to industrial control sources in fixed installations as well as use of radiation for research purposes,

should be used.

Criteria as mentioned in the sixth subsection, should reflect the overall exposure, e.g. for temperature, wind and precipitation.

Evaluation of the physical and chemical working environment factors should be part of the safety-related clearance of the activities, cf. Section 56 of these regulations.

Re Section 49 Occupational health service

Reference is made to Section 3-3 of the [Working Environment Act](#) as regards occupational health service. The occupational health service shall be approved by the Norwegian Labour Inspection Authority

and shall have a free and independent position in working environment matters, cf. Section 3-3, first and third subsections of the [Working Environment Act](#).

In addition, the employer's use of the occupational health service is regulated by the Regulations relating to approved occupational health service, etc. Reference is also made to the Norwegian Labour Inspection Authority's guidelines relating to those regulations.

In order to fulfil the requirement for cooperation as mentioned in the second subsection, the operator or the party responsible for the operation of a facility, shall enter into agreements with the principal undertaking and the employers of the contractor employees regarding distribution of the working environment tasks carried out by the occupational health service at the onshore facility.

CHAPTER VII COMPETENCE AND INFORMATION FOR CONDUCTING ACTIVITIES

Re Section 50 Competence

The requirement relating to ensuring competence implies, inter alia, that requirements are set for the necessary competence, that the competence is verified, and that it is maintained through practice, exercises, training and education.

Re Section 51 Training in safety and working environment

The training as mentioned in the first subsection, should include aspects that are of significance to the overall workload of the individual, cf. Section 46 of these regulations.

In order to fulfil the requirement for radiation protection training as mentioned in the second subsection, the Norwegian Radiation Protection Authority's training requirements should be used.

As regards requirements for training of safety delegates and members of working environment committees, reference is made to the Regulations relating to safety delegates and working environment committees.

Requirements for training are also set for industrial safety personnel, cf. the Guidelines regarding the Regulations relating to self-protection measures at industrial companies. There, minimum requirements are set for training, but this does not exempt the business from its obligation to carry out additional training measures if risk and emergency preparedness analyses show a need beyond the minimum requirements, e.g. to enable the industrial safety organisation to handle special situations that can occur in the company.

Re Section 52 Practice and exercises

As regards the areas of emergency preparedness covered by the Norwegian Industrial Safety and Security Organisation's provisions and guidelines for industrial safety organisations, reference is made to these for practice and exercises.

Re Section 53 Risk information during execution of work

No comments.

Re Section 54 Transfer of information at shift and crew changes

Shift and crew change means daily shift changes and replacement of personnel at the end of the period of work and stay at the onshore facility, both for operator and contractor employees.

CHAPTER VIII PLANNING, OPERATION AND CONTROL DURING ACTIVITIES

Re Section 55 Planning

No comments.

Re Section 56 Safety clearance of activities

In order to fulfil the safety clearance requirement, a work permit system should be used.

When activities are cleared in accordance with this section, a job safety analysis should be conducted when sub-activities are not covered by procedures, the procedures can conflict with each other, or the activities are new to the personnel involved.

Re Section 57 Monitoring and control

Conditions as mentioned in the first subsection, can be conditions and parameters as mentioned in Section 33, final subsection, of the Facilities Regulations, the status of other safety systems, ongoing activities and implemented compensatory measures.

The requirement relating to continuous monitoring as mentioned in the first subsection, entails that the personnel shall not be assigned tasks that can impair their handling of the control and monitoring functions, cf. also Section 21 of the Facilities Regulations and Section 18 of the Management Regulations. The requirement also entails that there should be at least two people to safeguard the monitoring and control functions in the central control room.

Re Section 58 Maintenance

Maintenance means the combination of all technical, administrative and managerial measures during the life cycle of a unit that are intended to maintain the unit in, or restore it to, a state in which it can perform the intended functions, cf. definition 2.1 (with associated terminology) in the NS-EN 13306 standard.

Maintenance includes activities such as monitoring, inspection, testing and repair, and keeping things tidy.

Functions also mean safety functions, cf. Section 3. For these functions, the requirement relating to maintenance entails that performance shall be ensured at all times, cf. Section 10.

Onshore facilities or parts thereof also mean temporary equipment.

All phases also mean periods in which the facility or parts of the facility are temporarily or permanently shut down.

Re Section 59 Classification

To fulfil the classification requirement, the [NORSOK Z-008](#) standard should be used in the area of health, working environment and safety.

Fault mode, failure cause and failure mechanism as mentioned in the second subsection, are defined in the NS-EN 13306 standard.

Re Section 60 Work on and operation of electrical installations

Reference is made to the Regulations relating to low-voltage electrical installations. In addition, the Regulations relating to electrical supply installations and the Regulations relating to the operational safety of electrical installations, in particular Chapter I, Section 5, Chapter II, Sections 6, 7 and 9 and Chapters III, IV and V, should be used.

To fulfil the work requirements as mentioned in the first subsection for manned underwater operations, IMCA/AODC 035 Code of practice for the safe use of electricity under water should be used.

As regards "the responsible party" as mentioned in the second subsection, reference is made to the Regulations relating to qualifications for electricians, which contains special provisions regarding parties responsible for operation and maintenance of electrical installations. Such parties responsible for operation and maintenance of electrical installations at onshore facilities, will be one of the "other participants in the activities" according to [Section 7 of the Framework Regulations](#), and are responsible in accordance with relevant regulations, their job description, etc. Being the responsible party entails having a particular professional responsibility for ensuring that electrical installations comply with applicable regulations at all times, and for keeping up to date on electrical installations and equipment under planning, construction and commissioning, etc.

Re Section 61

Transport of hazardous goods

As regards transport of hazardous goods, reference is made to the Regulations relating to ground transport of hazardous goods.

As regards portable pressure equipment for hazardous goods, reference is made to the Regulations relating to portable pressure equipment for hazardous goods.

Re Section 62

Lifting operations

See also Sections 12 and 41.

As a recommended standard for lifting operations, [NORSOK R-005N](#) Safe use of lifting and transport equipment at onshore petroleum facilities, should be used.

Re Section 63

Diving operations

As regards the use of air bottles for diving and respiratory protective equipment, the Regulations relating to air bottles for diving should be used.

CHAPTER IX

EMERGENCY PREPAREDNESS

Re Section 64

Establishment of emergency preparedness

In order to fulfil the strategy requirement as mentioned in the first subsection, Chapter 4 of the ISO 13702 standard should be used for health and safety-related emergency preparedness.

The defined hazard and accident situations as mentioned in the first subsection, mean a representative selection of hazard and accident situations used in the dimensioning of the emergency preparedness.

For those emergency preparedness areas covered by Section 1 of the Regulations relating to self-protection measures in industrial companies, etc., the requirements in this provision will be fulfilled by use of the Norwegian Industrial Safety and Security Organisation's provisions and guidelines for industrial safety.

Re Section 65

Emergency preparedness organisation

Emergency preparedness organisation as mentioned in the first subsection, means the personnel directly associated with the unit resources, area resources, the external resources and the regional resources.

In order to ensure robustness as mentioned in the first subsection, emphasis should be placed on the individual's education and competence, experience, physical suitability, personal qualities and experience from drills and training when selecting personnel.

The hazard and accident situations as mentioned in the first subsection, also include other hazard and accident situations than the defined, complex hazard and accident situations, stress situations and situations where key personnel are incapacitated or unable to carry out their duties.

For those emergency preparedness areas covered by Section 1 of the Regulations relating to self-protection measures in industrial companies, etc., the requirements in this provision will be fulfilled by use of the Norwegian Industrial Safety and Security Organisation's provisions and guidelines for industrial safety.

Re Section 66 **Emergency preparedness plans**

The emergency preparedness plans should include

- a) a description of purpose, scope and responsibility,
- b) a description of organisation, notification, mobilisation and communication,
- c) action plans, including preparedness strategies, emergency preparedness measures and decision criteria for emergency preparedness phases,
- d) a description of onshore facilities and prioritised vulnerable environmental resources in the impact area for acute pollution,
- e) a description of unit resources, area resources, regional resources and external resources and equipment,
- f) instructions for emergency preparedness personnel,
- g) any coordination procedures for coordination with other players and
- h) any cooperation procedures and agreements.

For those emergency preparedness areas covered by Section 1 of the Regulations relating to self-protection measures in industrial companies, etc., the requirements in this provision will be fulfilled by use of the Norwegian Industrial Safety and Security Organisation's provisions and guidelines for industrial safety.

Re Section 67 **Handling of hazard and accident situations**

Giving the **right notification** as mentioned in litera a, means notifying, inter alia,

- a) the onshore facility's central control room or another central function,
- b) one or more levels of the operator's emergency preparedness organisation,
- c) the contractors' emergency preparedness organisations,
- d) other licensees, owners and contractual partners if there is an agreement relating to coordinated emergency preparedness resources or in joint use of production and/or transport systems.

The scope of the notification will depend on the situation at hand.

The requirement relating to **rescue** as mentioned in litera c, entails that the responsible party shall be able to

- a) locate missing personnel using personnel control systems,
- b) bring personnel to a safe area,
- c) provide injured personnel with life-saving first aid and medical treatment.

The requirement relating to **evacuation** as mentioned in litera d, entails that the evacuation measures shall be of a nature to provide the highest likelihood of the personnel being evacuated from an exposed to a safe area. The transport requirement entails that transport of sick and injured personnel shall take place in a safe and prudent manner.

The requirement relating to **normalisation** as mentioned in litera e, also entails that

- a) injured or sick personnel are given the necessary treatment and care, such as medical treatment and follow-up of physical and psychological delayed injuries, and that the next of kin are provided with the necessary information, care and follow-up after major accidents,
- b) damage to onshore facilities is stabilised and corrected,
- c) the operation of onshore facilities resumes.

For the areas of the emergency preparedness which are subject to the Regulations relating to self-protection measures in industrial companies etc. Section 1, the requirements in this provision will be fulfilled by using the Norwegian Industrial Safety and Security Organisation's provisions and guidelines for industrial safety.

CHAPTER X HEALTH-RELATED MATTERS

Re Section 68 Health-related matters

General health legislation, etc.

The general health and food legislation applies to the responsible party and for the public health service. In addition, the [Framework Regulations](#), the Management Regulations and these regulations apply to the responsible party. Pursuant to the Municipal Health Services Act, the municipality shall ensure the necessary health service for everyone residing or temporarily staying in the municipality, including everyone that lives or temporarily stays within the area, including at onshore facilities. This includes preventive and curative health services, etc. as mentioned in Section 1-3 of the Municipal Health Services Act. Chapter 4a of the Municipal Health Services Act relating to environmental health protection with associated regulations as well as the Control of Communicable Diseases Act contain certain provisions which are directed at industrial enterprises, and others at the municipal health service.

Chapter 2 of the Specialist Health Service Act regulates the responsibility for specialist health services.

Health personnel in public and private health services, including occupational health services, shall provide immediate assistance pursuant to the provisions in Section 7 of the Health Personnel Act.

Reference is also made to the Norwegian Industrial Safety and Security Organisation's provisions and guidelines for industrial safety organisations.

In the current situation, the Norwegian Directorate of Health has not found any basis for proposing a legal basis for generally, or following a specific evaluation, imposing responsibility for curative health services on onshore facilities on the operator or the party responsible for the activities, neither during emergencies and accident situations nor otherwise. The operator can, on a voluntary basis, establish a private health service, alternatively use company health service personnel also for curative purposes.

Systems for contact and exchange of information relating to health matters

The requirement to contact and exchange of information as mentioned in the first and second subsection, should be seen in context of, inter alia, Section 1-4 of the Municipal Health Services Act. According to this provision, the municipality's health service shall at all times have the overview of the health situation in the municipality and the factors that may influence it. The health service shall propose health-promoting and preventive measures in the municipality. The municipality can cooperate with private organisations, etc., where suitable to promote the health service's purposes, cf. Section 1-4, third subsection of the Municipal Health Services Act.

Hygienic conditions as mentioned in the second subsection, includes, inter alia, contagion protection, cleaning and drinking water supply.

Risk and vulnerability analysis

The risk and vulnerability analysis as mentioned in the third subsection, will form the basis for the operator's information to the public health service, so that this can be dimensioned to cover the need for health assistance at the onshore facility.

Emergency preparedness

The health-related emergency preparedness which the regulations make the operator responsible for, should include

- a) advice to and professional guidance of relevant personnel on onshore facilities,
- b) communication with public emergency preparedness resources,
- c) prioritisation of transport for injured and sick persons.

Food and drinking water

As regards foods, etc., the provisions of the Food Act apply. As regards water supply and drinking water in the enterprise, the provisions of the Drinking Water Regulations apply. The regulations were stipulated by the Ministry of Health and Care Services for implementation of the drinking water directive 98/83/EEC,

included in the EEA Agreement on 25 January 2001. The regulations are now the responsibility of the Ministry of Health and Care Services.

The party responsible shall ensure that production, packing, storage, transport and the offering of foods take place in accordance with the food legislation.

Technical solutions for food and drinking water supply shall comply with the provisions in the Food Regulations for onshore activities as well as the Drinking Water Regulations. In addition, the technical solutions should be based on recognised methods to the extent possible.

The prohibition against polluting drinking water systems and internal distribution systems in Section 4 of the Drinking Water Regulations, apply to everyone, including operators of petroleum activities and owners of onshore facilities, and regardless of who the waterworks owner is. The water supply system and internal distribution system are defined in Section 3 of these regulations.

The operator or others participating in the activities, including owners of onshore facilities, may be the owner of (parts of) a water supply system. The owner will be subject to the provisions that apply for waterworks owners pursuant to the Drinking Water Regulations, cf. the definitions of water supply systems and waterworks owners in Section 3, Nos. 3 and 4 of the Drinking Water Regulations.

The waterworks owner shall ensure that the drinking water fulfils the requirements relating to quality, quantity and supply security when delivering to recipients, cf. Section 5, first subsection of the Drinking Water Regulations. If there are multiple waterworks owners on the route from water source to consumer, an owner later on the route, that may be an operator of petroleum activities, will be responsible vis-à-vis the recipient, also for poor water quality caused by a waterworks owner earlier on the route, pursuant to the Drinking Water Regulations. However, the operator can in certain cases hold its supplier responsible, cf. civil law rules.

As the owner of an internal distribution grid, the operator and others are responsible for drinking water quality as stipulated in Section 5, final subsection of the Drinking Water Regulations, i.e. for ensuring that the drinking water quality, when the water is offered to the consumer, is not impaired beyond the requirements in the Drinking Water Regulations. However, pursuant to the Drinking Water Regulations, the owner of an internal distribution grid, however, is not responsible for a sufficient amount of water and supply security, which the waterworks owner is.

Reference is made to the Guidelines to the Drinking Water Regulations and the most recently updated available guideline material from the Norwegian Institute of Public Health relating to how to ensure drinking water with sufficient quality.

Concerning supervision of foods and drinking water: In accordance with the [Petroleum Act](#) with regulations, the Norwegian Board of Health supervises foods, drinking water supply systems and internal distribution systems within the fences of onshore petroleum facilities. Basically, the Norwegian Food Safety Authority or its authorised representative conducts supervision in accordance with the Food Act. For land-based public or private water supplies which the onshore facility is connected to, the municipality also conducts supervision in addition to the Norwegian Food Safety Authority, pursuant to Section 4a-2 of the Municipal Health Services Act. The Norwegian Board of Health has in practice been delegated the supervisory authority in accordance with the Food Act and coordinates the supervision with the municipalities within the onshore facilities.

CHAPTER XI CONCLUDING PROVISIONS

Re Section 69 Supervision, decisions, enforcement, etc.

No comments.

Re Section 70 Entry into force

This section entails that, in the area of health, safety and working environment, the technical requirements in regulations that were in force until these regulations entered into force, can still be used as a basis.

Major rebuilding and modifications as mentioned in the second subsection, can be installation of a new module, major intervention in hydrocarbon-bearing systems or larger changes to physical barriers.

Existing onshore facilities as mentioned in the second subsection, mean onshore facilities where one of the following approvals or permits has been granted before these regulations entered into force: Plan for Development and Operations (PDO) of petroleum deposits approved in accordance with Section 4-2 of the [Petroleum Act](#), or special permit granted based on a Plan for Installation and Operation (PIO) of facilities for transport, and for utilisation of petroleum in accordance with Section 4-3 of the [Petroleum Act](#), or permit granted in accordance with the Temporary Regulations of 19 December 2003 No. 1595 relating to safety and working environment for certain petroleum facilities on land and associated pipeline systems, Section 16 regarding application for permit for development of new activities (main application), or corresponding permit granted in accordance with regulations that were in force before the Temporary Regulations entered into force.

REFERENCE LIST

1. Orientation on key regulations that apply to the activities in addition to these regulations for the Petroleum Safety Authority Norway's area of authority

Regulations of 29 April 1977 No. 7 relating to safety delegates and working environment committees,
Regulations of 20 April 1977 No. 9193 relating to tractors,
Regulations of 10 September 1982 No. 1377 relating to technical installations,
Regulations of 13 February 1984 No. 427 relating to prohibition against highly combustible textiles,
Regulations of 14 June 1985 No. 1157 relating to work on ionizing radiation,
Regulations of 19 November 1985 No. 2105 relating to digging and reinforcing of ditches,
Regulations of 10 January 1986 No. 17 relating to the Working Environment Act's application for work in sole proprietorship companies within building and construction,
Regulations of 11 April 1986 No. 870 relating to local safety delegates and working environment committees for loading and offloading,
Regulations of 25 August 1986 No. 1792 relating to bolt guns with accessories,
Regulations of 30 November 1990 No. 944 relating to diving,
Regulations of 14 December 1993 No. 1133 relating to qualifications for electricians (FKE),
Regulations of 24 May 1993 No. 1425 relating to use of personal protective equipment in the workplace,
Regulations of 7 July 1994 No. 735 relating to simple pressure vessels,
Regulations of 19 August 1994 No. 819 relating to construction, design and production of personal protective equipment (PPE),
Regulations of 5 October 1994 No. 919 relating to gas appliances and equipment,
Regulations of 6 October 1994 No. 972 relating to safety signs and signalling in the workplace,
Regulations of 10 November 1994 No. 1053 relating to harbour work,
Regulations of 15 December 1994, No. 1259 relating to work at computer monitors,
Regulations of 20 January 1995 No. 156 relating to heavy and monotonous work,
Regulations of 16 February 1995 No. 170 relating to work sites and workplaces,
Regulations of 25 August 1995 No. 768 relating to genetic defects and working environment,
Regulations of 1 March 1996 No. 229 relating to aerosol containers,
Regulations of 9 December 1996 No. 1242 relating to equipment and safety systems for use in explosive areas (ATEX),
Regulations of 19 September 1997 No. 1018 relating to regional safety delegates for building and construction work,
Regulations of 19 December 1997 No. 1322 relating to protection of employees against hazards relating to biological factors,
Regulations of 30 April 1998 No. 551 relating to work with children and young people,
Regulations of 26 June 1998 No. 608 relating to use of work equipment,
Regulations of 17 September 1998 No. 982 relating to health and safety in connection with drilling-related production industry for the land-based sector,
Regulations of 6 November 1998 No. 1060 relating to low voltage electrical installations,
Regulations of 10 February 1999 No. 206 relating to reduction of emissions of petrol fumes from storage and distribution of petrol,
Regulations of 16 April 1999 No. 525 relating to combustibility of mattresses and stuffed furniture,
Regulations of 9 June 1999 No. 721 relating to pressure equipment (RPE),
Regulations of 20 August 1999 No. 955 relating to use and maintenance of electrical medical equipment,
Regulations of 14 April 2000 No. 412 relating to the structure and use of substance files for hazardous substances in businesses (the Index Regulations),
Regulations of 30 April 2001 No. 443 relating to protection against exposure to chemicals in the workplace (the Chemical Regulations),
Regulations of 26 June 2001 No. 792 relating to portable pressure equipment for hazardous goods,
Regulations of 4 December 2001 No. 1450 relating to maritime electrical installations,
Regulations of 26 June 2002 No. 922 relating to handling of explosive substances,
Regulations of 5 July 2002 No. 715 relating to work carried out in the employee's home,
Regulations of 16 July 2002 No. 1139 relating to classification, marking etc. of hazardous chemicals,
Regulations of 22 November 2002 No. 1323 relating to registration of businesses that engineer, construct and maintain electrical installations,

Regulations of 30 June 2003 No. 911 relating to health and safety in explosive atmospheres,
Regulations of 25 January 2005 No. 47 relating to soluble chromium in cement.
Regulations of 26 April 2005 No. 362 relating to asbestos, with the exception of Section 11 regarding communication,
Regulations of 17 June 2005 No. 672 relating to measures to prevent and limit the consequences of major accidents in activities where hazardous chemicals are used (the Major Accident Regulations),
Regulations of 30 June 2005 No. 794 relating to safety, health and working environment in rock work,
Regulations of 6 July 2005 No. 804 relating to protection against mechanical vibrations,
Regulations of 26 April 2006 No. 456 relating to protection against noise in the workplace,
Regulations of 31 October 2008 No. 1164 relating to electrical equipment,
Regulations of 1 April 2009 No. 384 relating to ground transport of hazardous goods,
Regulations of 11 April 2009 No. 162 requiring enterprises within certain industries to have an approved occupational health service,
Regulations of 20 May 2009 No. 544 relating to machinery,
Regulations of 3 August 2009 No. 1028 relating to safety, health and working environment at building or construction sites (the Building Owner Regulations),
Regulations of 10 September 2009 No. 1173 relating to the employer's use of approved occupational health services and relating to approval of occupational health services.

2. Regulations that are recommended as standards throughout these guidelines

Regulations of 15 November 1983 No. 1674 relating to control, marking and filling of air bottles for diving and respiratory protective equipment with amendments, most recently of 2 November 2004,
Regulations of 14 June 1985 No. 1410 relating to work in tanks,
Regulations of 14 April 1989 No. 335 relating to scaffolding, ladders and work on roofs, etc. with amendments, most recently of 13 September 2004,
Regulations of 13 February 1992 No. 1263 relating to jet water washing, etc. with amendments, most recently of 20 December 2002,
Regulations of 26 February 1998 No. 179 relating to welding, thermal cutting, thermal spraying, carbon arc gouging, soldering and grinding (hot work),
Regulations of 20 December 2005 No. 1626 relating to electrical supply installations,
Regulations of 28 April 2006 No. 458 relating to safety when working on and operating electrical installations,
Regulations of 8 June 2009 No. 602 relating to handling of flammable, reactive and pressurised substances as well as equipment and systems used in such handling (the Hazardous Substances Regulations).

3. Acts

Act of 24 May 1929 No. 4 relating to supervision of electrical installations and electrical equipment (the Electrical Supervision Act),
Act of 11 June 1976 No. 79 relating to the control of products and consumer services (the Product Control Act),
Act of 19 November 1982 No. 66 relating to the health service in the municipalities (the Municipal Health Services Act),
Act of 5 August 1994 No. 55 relating to control of communicable diseases (the Communicable Diseases Act),
Act of 29 November 1996 No. 72 relating to the petroleum Activities (the Petroleum Act),
Act of 2 July 1999 No. 61 relating to the specialist health service, etc. (the Specialist Health Services Act),
Act of 2 July 1999 No. 64 relating to health personnel, etc. (the Health Personnel Act),
Act of 14 June 2002 No. 20 relating to the prevention of fire, explosion and accidents involving hazardous substances and the fire service (the Fire and Explosion Prevention Act),
Act of 19 December 2003 No. 124 relating to food production and food safety, etc. (the Food Act),
Act of 17 June 2005 No. 62 relating to working environment, working hours and employment protection, etc. (the Working Environment Act).

4. Other regulations

The Ministry of Health and Care Services

Regulations of 12 April 2001 No. 1372 relating to water supply and potable water (the Drinking Water Supply Regulations).

The Norwegian Industrial Safety and Security Organisation

Regulations and guidelines for industrial safety, 2008.

The Norwegian Radiation Protection Authority

[Regulations of 21 November 2003 No. 1362 relating to radiation protection and use of radiation \(the Radiation Protection Regulations\)](#).

5. Standards and guidelines

The Norwegian Labour Inspection Authority

The Norwegian Labour Inspection Authority's administrative standards for pollution in work atmosphere, Order No. 361,

The Norwegian Labour Inspection Authority's guidelines regarding organisation and arrangement of work – guidelines for Sections 4-1 through 4-4 of the Working Environment Act, order No. 327.

Det Norske Veritas AS (DNV)

DNV-OS-F101 Submarine pipeline systems, 2007.

European Standard (EN)

EN 894-1, Safety of machinery – Ergonomics requirements for the design of displays and control actuators – Part 1: General principles for human interactions with displays and control actuators, 1997,

EN 894-2, Safety of machinery – Ergonomics requirements for the design of displays and control actuators – Part 2: Displays, 1997,

EN 894-3, Safety of machinery – Ergonomics requirements for the design of displays and control actuators – Part 3: Control actuators, 2000,

EN 1127-1, Explosive atmospheres – Explosion prevention and protection – Part 1: Basic concepts and methodology, 2007

International Electrotechnical Commission (IEC)

IEC 60079-10-1 Explosive atmospheres, classification of areas – explosive gas atmospheres, 2008,

IEC 60079-13, Electrical apparatus for explosive gas atmosphere – Part 13: Construction and use of rooms or buildings protected by pressurization, 1982

IEC 61508 Functional safety of electrical/electronic/programmable electronic safety-related systems, Part 1-7, 1998,

IEC 61511 Functional safety – Safety instrumented systems for the process industry sector, 2004.

Energy Institute

IP 15/ EI 15 Model code of safe practice in the petroleum industry Part 15: Area classification code for installations handling flammable fluids, 2005.

International Organization for Standardization (ISO)

ISO 834 Fire-resistance tests – Elements of building construction, Part 1, 1999, 3, 1994 and 4 through 7, 2000,

ISO 6385 Ergonomic principles in the design of work systems, first edition 1981,

ISO 13623 Petroleum and natural gas industries – Pipeline transportation systems, 2000,

ISO 23251 Petroleum, petrochemical and natural gas industries - Pressure-relieving and depressuring systems, 2006.

The Norwegian Electrotechnical Committee (NEK)

NEK 400:2006 Electrical low voltage installations,

NEK 420:2007 Electrical installations in explosive areas with gas and dust,

NEK 440:2006 Station installations exceeding 1 kV.

Norwegian Standard (NS)

NS 4931 Guidelines for assessing human reactions to low-frequency horizontal movements (0.063 to 1 Hz) in permanent structures, particularly buildings and offshore installations, 1985,

NS-EN 614-1, Safety of machinery – Ergonomic design principles part 1: Terminology and general principles, 1995,

NS-EN 614-2, Safety of machinery – Ergonomic design principles part 2: Interactions between the design of machinery and work tasks,
NS-EN 13306 Maintenance terminology, 2001,
NS-EN ISO 11064 Ergonomic design of control centres, Part 1-4, 2000-2004,
NS-EN ISO 13702 Petroleum and science gas industries – Control and mitigation of fire and explosions on offshore production installations
NS-EN ISO 15138 Petroleum and natural gas industry – Offshore production facilities – Heating, ventilation and air conditioning, 2008.

NORSOK standards

[NORSOK R-005 Safe use of lifting and transport equipment at onshore petroleum facilities, Revision 1, June 2007,](#)

[NORSOK Z-008 Criticality analysis for maintenance purposes, Revision 2, Nov. 2001.](#)

The International Marine Contractors Association (IMCA)

The Association of Offshore Diving Contractors: AODC 035 Code of practice for the safe use of electricity under water, 1985.