

# Regulations of 22 December 1993 No. 1239 on risk analyses for mobile offshore units

**Legal basis:** Laid down by the Norwegian Maritime Authority on 22 December 1993 under the Act of 9 June 1903 No. 7 relating to public control of the seaworthiness of ships etc. Legal basis amended to Act of 16 February 2007 No. 9 relating to ship safety and security (Ship Safety and Security Act) sections 7, 9, 21, 22, 28, 28a, 31, 42 and 45, cf. Formal Delegation of 16 February 2007 No. 171, Formal Delegation of 31 May 2007 No. 590, Formal Delegation of 29 June 2007 No. 849 and Formal Delegation of 19 August 2013 No. 1002.

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

**Amendments:** Amended by Regulations of 11 October 1996 No. 981, 2 March 1999 No. 396, 11 April 2003 No. 501, 29 June 2007 No. 1006 (i.a. legal basis), 14 March 2008 No. 305, 18. January 2011 No. 56, 19 August 2013 No. 1036, 28 June 2016 No. 833, 19 December 2017 No. 2322, 24 January 2022 No.118.

## Chapter I Introductory provisions

### Section 1

#### *Scope of applicability*

1. These Regulations apply to mobile offshore units which will be or are registered in a Norwegian register of ships.
2. Units registered in a Norwegian register of ships may until the next certificate issuance comply with the requirements in force at the time of the last certificate issuance.

Amended by Regulations of 11 Oct 1996 No. 981 (in force on 1 Jan 1997), 11 April 2003 No. 501 (in force on 1 July 2003).

### Section 2

#### *Definitions*

1. *Acceptance criteria:* means criteria based on regulations, standards, experience and/or theoretical knowledge used as a basis for decisions about acceptable risks. Acceptance criteria may be expressed verbally or numerically.
2. *Other supervisory services involved:* means institutions which in addition to the Norwegian Maritime Authority exercise supervisory authority pursuant to the Ship Safety and Security Act.
3. *Defined hazard and accident situations:* means hazard and accidents situations forming the basis of establishment of the activity's emergency preparedness.
4. *Dimensioning accidental event:* means an accidental event which, in accordance with the defined acceptance criteria, represents an unacceptable risk and which therefore forms the basis of the design and use of the mobile offshore unit and its emergency preparedness.
5. *Dimensioning base accidental load:* means the greatest load which the mobile offshore unit must be capable of withstanding for a length of time sufficient to allow all persons on board and, if necessary, the mobile offshore unit to be brought to safety, and which therefore forms the basis of the design and use of the unit and its emergency preparedness.
6. *FMEA:* means Failure Mode and Effect Analysis.
7. *FTA:* means Fault Tree Analysis.
8. *Recognized classification society:* Any classification society with which the Ministry has entered into an agreement pursuant to section 41 of the Ship Safety and Security Act:
  1. American Bureau of Shipping (ABS)
  2. Bureau Veritas (BV)
  3. DNV GL
  4. Lloyd's Register of Shipping (LR)
  5. Nippon Kaiji Kyoaki (Class NK)
  6. Rina Services S.p.A (RINA).
9. *MOU classification society:* A recognized classification society with which there is an additional agreement on its carrying out inspections and surveys, etc. on mobile offshore units. The following societies are MOU classification societies:
  1. American Bureau of Shipping (ABS)
  2. DNV GL
  3. Lloyd's Register of Shipping (LR).
10. *HAZOP:* means Hazard and Operability Analysis.
11. *Mobile offshore unit:* means a mobile platform, including drilling ship, equipped for drilling for subsea petroleum deposits, and mobile platform for other purposes than drilling for subsea petroleum deposits.

12. *Safety Management System*: All systematic efforts which the company is required to make to ensure that activities are planned, organized, performed and maintained in accordance with requirements laid down in or pursuant to the Act of 16 February 2007 No. 9 relating to ship safety and security.
13. *Reliability/vulnerability analysis*: means an analysis which, based on the system's/equipment's design, structural restrictions, layout etc., considers the probability of functional failure, including an assessment of any weak sides of the system/equipment.
14. *Company*: Cf. the definition given in section 4 of the Ship Safety and Security Act.
15. *Risk*: means an expression of the hazard represented by an undesirable incident to human beings, the environment or material assets. The risk is expressed as the probability of, and consequences of, an accidental event.
16. *Risk analysis*: means a systematic procedure to describe and/or calculate the risk to persons on board, the environment and the mobile offshore unit itself. The risk analysis is carried out by identifying undesirable incidents and the causes and consequences hereof.
17. *Vital operating system*: means a system used in normal operating situations, the failure of which can cause a major accident.
18. *Safety and emergency system*: means a system with a designated safety and emergency function of which shall be activated in the event of an abnormal incident, the failure of which can cause serious escalation of the incident.
19. *Safety functions*: means functions to ensure that control of the unit, escape and evacuation are possible after an accidental event has occurred.
20. *Accidental event*: means an uncontrolled event which may lead to loss of human life, personal injury, damage to the environment and financial loss.
21. *Verification*: Confirmation, by investigating and producing objective evidence, that specified requirements are fulfilled.

Amended by Regulations of 11 April 2003 No. 501 (in force on 1 July 2003), 29 June 2007 No. 1006 (in force on 1 July 2007), 14 March 2008 No. 305, 18 January 2011 No. 56, 28 June 2016 No. 833 (in force on 1 July 2016), 19 December 2017 No. 2322 (in force on 1 January 2018).

## **Chapter II**

### **General provisions**

#### Section 3

##### *Duties*

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

Amended by Regulations of 11 April 2003 No. 496 (in force on 1 July 2003), 29 June 2007 No. 1006 (in force on 1 July 2007), 19 August 2013 No. 1036 (in force on 20 August 2013).

#### Section 4

##### *Exemptions*

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

- a) it is established that the requirement is not essential and that the exemption is considered justifiable in terms of safety;
- b) it is established that compensating measures will maintain the same level of safety as required by these Regulations.

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

Amended by Regulations of 11 April 2003 No. 501 (in force 1 July 2003), 28 June 2016 No. 833 (in force on 1 July 2016).

## **Chapter III**

### **Documentation and revision**

#### Section 5

##### *Documentation*

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

Amended by Regulations of 11 April 2003 No. 501 (in force on 1 July 2003), 29 June 2007 No. 1006 (in force on 1 July 2007).

## Section 6

Repealed by Regulation of 11 April 2003 No. 501 (in force on 1 July 2003).

## Section 7

### *Revision of the risk analysis*

1. The company shall, if necessary, revise the risk analysis if the preconditions of the analysis have been altered as a consequence of physical modifications of the unit, and also take account of technical development and experience of accidents.

Considerable alterations of working conditions and operating conditions shall be incorporated into the company's Safety Management System with subsequent corrections of the risk analysis.

The company shall establish criteria for determining when to revise the risk analysis.

2. When the unit undergoes its 5-year periodical survey the status of the risk analysis, or, where appropriate, the revised risk analysis, shall be reviewed by the company and the protection and environment committee.

Amended by Regulations of 2 March 1999 No. 396 (in force on 1 Sept 1999), 11 April 2003 No. 501 (in force on 1 July 2003), 29 June 2007 No. 1006 (in force on 1 July 2007).

## Chapter IV

### **Execution of risk analyses for mobile offshore units**

Heading amended by Regulation of 11 April 2003 No. 501 (in force on 1 July 2003).

## Section 8

### *Qualification requirements*

The risk analysis shall be carried out by a group having the following members:

- a) personnel having technical/practical and operational experience in the operation of units
- b) persons who can provide documentary evidence of knowledge of, and experience in, the execution of risk analysis, and who are familiar with the unit's technical and operational systems
- c) Head Safety Delegate.

Amended by Regulation of 11 April 2003 No. 501 (in force on 1 July 2003).

## Section 9

### *The risk analysis*

The risk analysis shall be divided into the following sub-analyses:

- a) concept analysis
- b) design analysis
- c) construction analysis
- d) reliability/vulnerability analysis
- e) contingency analysis (may be incorporated into a, b, and c).

For mobile offshore units which have already been put into operation or units which are registered in a Norwegian register of ships after construction, no concept or design analysis is required.

Amended by Regulations of 11 April 2003 No. 501 (in force on 1 July 2003), 24 January 2022 No. 118 (in force 24 January 2022).

## Section 10

### *The company's plan for the risk analysis*

1. The company shall prepare a plan for the execution of the risk analysis.
2. The plan shall contain:
  - a) A specification of which persons in the company are responsible for the execution of the risk analysis, including the persons in the company responsible for following up the analysis results in further work with the mobile offshore unit.
  - b) The company's specification of the standard intended operation which the mobile offshore unit with equipment is expected to carry out.
  - c) A specification of the vital operating systems and safety and emergency systems for which the company will carry out reliability/vulnerability analyses.
  - d) The dimensioning accidental events/accidental loads defined by the company, for which the owner wishes to dimension the unit, and which form the basis for the use of the unit.
  - e) The dimensioning accidental events/accidental loads given in or derived from other relevant regulatory requirements.

- f) The acceptance criteria defined by the owner beyond the requirements of these Regulations, cf. Chapter VI, and requirements of other relevant regulations.
- g) Time schedule for the execution of the risk analysis with sub-analyses.

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

## Section 11

### *General requirements for the risk analysis*

1. The risk analysis for mobile offshore units shall document that the unit satisfies acceptance criteria as set out in these Regulations and acceptance criteria defined by the company, after the necessary risk reducing measures have been taken.
2. The scope of the risk analysis may be limited where risks have previously been documented to the Norwegian Maritime Authority.
3. If the operator or the operator's sub-contractor brings on board equipment which may affect the risk level, additional analyses shall be carried out, covering the actual equipment and the way in which it affects the mobile offshore unit's other systems and emergency preparedness on board.
4. The risk analysis shall include:
  - a) The company's general operational conditions and the necessary technical documentation with associated structural restrictions.
  - b) Specified dimensioning accidental events, and the consequences which such events may have for the mobile offshore unit, persons on board and pollution of the environment.
  - c) Where appropriate, new dimensioning accidental events and/or modifications of those originally specified by the company.
  - d) Risk evaluation against the company's acceptance criteria and relevant regulatory requirements.
  - e) Sub-analyses as referred to in section 9, including special risk evaluations required by other relevant regulations for mobile offshore units.
  - f) In addition to technical malfunctions etc., the risk analysis shall attempt to take account of malfunctions of the human factor.
  - g) Evaluation of various important risk areas, of whether the introduction of new technology, modified operational procedures etc., have contributed to previous risk models, data etc. having become invalid, or the preconditions of the same having been altered. The risk model of a blowout, for which a detailed analysis must be carried out for each mobile offshore unit, is of particular importance in this connection.
  - h) A technical environmental analysis identifying the potential for reducing the risk of pollution, in a normal condition and in an accident situation.
5. The risk analysis shall consider, i.a., the following:
  - a) Whether local accidental events may lead to the loss of systems important for safety, cf. section 25.
  - b) Whether accidental events may be restricted to one area, e.g. by physical barriers and emergency shut-down systems.
  - c) Whether an accidental event will escalate if several systems fail successively.
  - d) Whether efficient emergency action may be carried out, using the planned safety and emergency system.
  - e) Whether escape, removal of persons to a safe area, emergency transit and evacuation by sea or other forms of evacuation would be possible.
6. The risk analysis shall result in:
  - a) A list of the dimensioning accidental events/accidental loads analysed in the risk analysis, and which are to be specified in an annex to the maritime certificates.
  - b) A list of recommended, systematically chosen constructional risk-reducing measures to be taken before the mobile offshore unit is put into operation. Probability-reducing measures shall be given priority over consequence-reducing measures.
  - c) A list of systematically chosen risk reducing measures relating to operations, maintenance, contingency, training and manning, presumed to be taken by the company in the operational phase.
  - d) A conclusion stating whether the mobile offshore unit is considered capable of satisfying the acceptance criteria in accordance with these Regulations and the acceptance criteria defined by the company (cf. section 10 subparagraph 2 f, sections 19, 20, 21, 22 and 23).

Amended by Regulations of 11 April 2003 No. 501 (in force on 1 July 2003), 29 June 2007 No. 1006 (in force on 1 July 2007).

## Section 12

### *Concept analysis*

The lay-out analysis shall be carried out in an early phase, in order that potential hazards may be identified and eliminated or minimised through layout and constructional measures.

The lay-out analysis shall in particular consider the safety of new methods of arranging systems, operating or organising activities.

1. The concept analysis shall include:

- a) The mobile offshore unit's layout, including subdivision and location of systems important for safety, and power supply, control systems, cable routing etc., and the location of these in relation to each other.
  - b) The need for duplication and segregation of systems, and any necessary barriers in the event of an accident.
  - c) Consideration of accidental events within any area/space, and whether such events will put vital systems out of operation. Including how safety and emergency systems can be arranged in order to be operative in the event of such accidents.
2. The concept analysis shall result in:
- a) Lists in accordance with the requirements of section 11 subparagraph 6 a, b and c.
  - b) Conclusion in accordance with the requirement of section 11 subparagraph 6 d.

## Section 13

### *Design analysis*

The design analysis is to bring the concept analysis up to date and extend it by incorporating results from analyses completed in accordance with requirements of these Regulations, including enhanced detailed knowledge of layout and systems etc.

- 1. The design analysis shall include:
  - a) Alterations in design, location of equipment and systems etc., in relation to the concept analysis.
  - b) Results of reliability/vulnerability analyses carried out by sub-contractors for vital operating systems and safety and emergency systems.
  - c) Results of special risk evaluations in accordance with requirements of other regulations for mobile offshore units.
- 2. The design analysis shall result in:
  - a) Adjusted lists in accordance with the requirements of section 11 subparagraph 6 a, b and c.
  - b) Conclusion in accordance with the requirement of section 11 subparagraph 6 d.

## Section 14

### *Construction analysis*

The construction analysis is to bring the design analysis up to date for areas in which it has been necessary to carry out alterations during the construction phase.

- 1. The construction analysis shall include:
  - a) Alterations in design, location of equipment and systems etc. in relation to the design analysis.
  - b) Final constructional limits and restrictions on the equipment and systems.
- 2. The construction analysis shall result in:
  - a) A final list of special risk-reducing measures relating to operations, maintenance, contingency and manning, to be taken by the company in the operational phase, and which are presumed to be incorporated into the company's Safety Management System.
  - b) A final list specifying how the recommended constructional risk-reducing measures have been implemented, and/or taken account of through compensating measures of an operational kind.
  - c) A final list of special risk-reducing measures relating to operations, maintenance, contingency and manning, to be taken by the company in the operational phase, and which are presumed to be incorporated into the company's Safety Management System. Including incorporation into the operations manual, maintenance system, training plan, contingency manual, organisation plan, and to be taken into consideration when the size of the manning and qualifications of the crew are determined.
  - d) The final conclusion establishing whether the mobile offshore unit meets the acceptance criteria of these Regulations, cf. Chapter VI and section 10 subparagraph 2 f.

Amended by Regulations of 2 March 1999 No. 396 (in force on 1 Sept 1999), 29 June 2007 No. 1006 (in force on 1 July 2007).

## Section 15

### *Reliability/vulnerability analysis*

In the risk analysis the company shall incorporate a reliability/vulnerability analysis from every vendor of vital operating systems and safety and emergency systems. The result of the reliability/ vulnerability analyses shall be incorporated into and taken into account in the design analysis and construction analysis.

- 1. The reliability/vulnerability analysis shall include, i.a.:
  - a) The vendor's general operational conditions and constructional restrictions, and the necessary technical documentation for equipment/systems.
  - b) Identification and probability of critical single failures, and an identification of weaknesses in the system in an accidental event.
  - c) The company shall also describe consequences resulting from possible critical single failures.
  - d) All preconditions in connection with installation, testing and operation on board.
- 2. The reliability/vulnerability analysis shall result in:
  - a) A list of constructional restrictions for vital operating systems and safety and emergency systems.

- b) A list of recommended constructional risk-reducing measures to be taken before the mobile offshore unit is put into operation.
- c) Proposals for systems to combat accidental events in the system/equipment concerned.
- d) A list of operational, maintenance and contingency measures presumed to be taken by the company in the operational phase.
- e) The necessary manning and qualification requirements for the operation of the system/equipment concerned.
- f) A conclusion specifying whether the system/equipment concerned is considered to be capable of meeting the acceptance criteria of these Regulations, cf. Chapter VI, section 22.

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

## Section 16

### *Emergency preparedness analysis*

1. An emergency preparedness analysis shall form part of the risk analysis, i.e. contingency preparedness shall be considered in the concept, design and construction analyses.
2. The emergency preparedness analysis shall be carried out on the basis of the defined hazard and accidental events, including the dimensioning accidental events with the accidental loads forming part of the risk analysis, and shall include the vital operating systems and safety and emergency systems on the mobile offshore unit.
3. The emergency preparedness analysis shall result in:
  - a) A list of constructional and operative contingency measures. The conclusions of the reliability/vulnerability analysis (cf. section 15 subparagraph 2 c and d) shall be included.
  - b) A list of necessary safety and emergency equipment, including its planned use in various defined hazard and accidental events.
  - c) A description of specific contingency requirements to be implemented in order to meet the acceptance criteria.
4. Defined hazard and accident situations with contingency plans shall be described and incorporated into the contingency manual, including technical, organisational, operational and training measures in connection with emergency preparedness on board. A summary emergency preparedness plan, including warning procedures, shall be prepared as an introduction to the contingency manual.
5. The owner's training manual shall contain a training programme developed with its basis in the defined accidental events. Special emphasis shall be placed on training contingency measures preventing further development of defined hazards and accidents and dimensioning accidental events.
6. The total contingency, including technical, organisational, operational and training matters, shall be reviewed at least once per year to maintain and improve the level of safety on board.

## Chapter V (Repealed)

Repealed by Regulation of 11 April 2003 No. 501, in force on 1 July 2003.

## Sections 17–18

Repealed by Regulation of 11 April 2003 No. 501, in force on 1 July 2003.

## Chapter VI Acceptance criteria with derived design criteria

### Section 19

#### *Objectives and acceptance criteria.*

1. The risk of accidental events involving persons, the unit and the environment shall be reduced as far as practicable.
2. The company may specify his own acceptance criteria beyond the requirements of these Regulations, adapted to the mobile offshore unit's constructional and operational conditions.
3. In the risk analysis the company shall specify the overall objectives of safety, for the unit and its personnel in the operational phase. Based on the overall objectives, specific sub-objectives shall be set out for the planning and carrying out of safety work, which shall be subject to current evaluation during the operational phase in accordance with the overall objectives. The results of the risk analysis (cf. section 14 subparagraph 2) shall form the basis for the owner's continued safety work in day-to-day operation to reduce risks.

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

## Section 20

### *Basic acceptance criteria*

1. The mobile offshore unit shall be capable of withstanding defined dimensioning accidental events/loads in accordance with criteria given in these Regulations (cf. section 21), other regulations or as prescribed by the company.
2. It shall be highly probable that the safety functions (SF) as set out in section 21 of the Regulations will remain intact during a dimensioning accidental event for a sufficient period of time to be able to control and combat the accident, to carry out emergency transit and/or evacuation.
3. Acceptance criteria shall also cover risks which are not a consequence of direct accidental events, but which nevertheless expose personnel on board to harmful effects which, in turn, may cause accidents, as for instance poisoning due to incorrect treatment of foodstuffs/potable water.

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

## Section 21

### *Design criteria for safety functions*

#### 1. Safety functions

Based on acceptance criteria as set out in sections 19 and 20, general minimum design criteria are derived for safety functions as specified below:

##### a) SF 1. Escape routes<sup>1</sup>:

In an accidental event there shall be at least one escape route from every space/area, leading to a temporary refuge (TR). It shall be possible to maintain escape routes to temporary refuges for at least 15 minutes.

##### b) SF 2. Temporary refuges (TR)<sup>1</sup>:

It shall be possible to maintain a temporary refuge for all persons on board for at least 30 minutes, in order that it will be possible to await further development of the accident, combat the accident and if necessary carry out an evacuation by sea from this area.

Where it can be documented that the unit has a compensating ability to carry out a speedy emergency transit, e.g. away from a blowout, fire on the sea or similar incident, a shorter period of time for protection against accidental loads against the temporary refuge may be stipulated.

A temporary refuge for all persons on board shall be located near the main evacuation appliances and be built-in, insulated against fire, and fitted with suitable ventilation to keep out smoke and other gases.

Important monitoring and control functions shall be located in the temporary refuge, e.g. communication sets, unit shutdown panel and means for the activation of fixed fire-extinguishing systems, deluge systems etc.

##### c) SF 3. Supporting structure:

The hull, including lifeboat platforms etc. shall remain intact for a period of time sufficient to allow emergency transit and/or evacuation of the unit to be carried out.

##### d) SF 4. Evacuation appliances:

It shall be possible to use the main evacuation appliances for all persons on board, in any dimensioning accidental event and in any weather.

##### e) SF 5. Vital systems which shall be intact/capable of functioning to a necessary degree in a dimensioning accidental event:

Important control functions to ensure control shall be kept intact for a period of time necessary to prevent accident aggravation, and to combat an accident before a possible evacuation is carried out.

Amended by Regulation of 11 April 2003 No. 501 (in force on 1 July 2003).

- 1 Cf. Regulations of 11 April 2003 No. 492 on life-saving appliances and evacuation on mobile offshore units.

## Section 22

### *Requirements for equipment and systems*

1. Possible single faults in equipment and systems shall not cause critical incidents. Possible critical single faults shall be disclosed by the reliability/vulnerability analysis, and shall be eliminated by constructional measures. Where elimination is not possible, the critical component or, if relevant, parts of the system, shall be listed in the analysis with accompanying suggestions of systematically chosen risk-reducing measures, including measures in respect of operation and maintenance, and requirements for personnel with qualifications to ensure a low probability of failure.
2. Vital operating systems and safety and emergency systems shall be redundant. This shall be achieved by segregation, duplication, protection against common mode failure or similar, in order that a failure/accidental event in an area/space will not cause functional failure.
3. The degree of redundancy of the individual system/piece of equipment may be adapted to the degree of hazard of a functional failure in the same system/piece of equipment, assessed against:
  - a) Component reliability.
  - b) The design of a system/piece of equipment to avoid a fault leading to critical functional failure («fail to safety»).
  - c) Maintenance.

- d) Training and practice.

## Section 23

### *Acceptance criteria for accidents at work*

1. Work shall be planned and carried out in such a way that injury probability for is diminished.
2. A work permit shall be issued for special operations not covered by the company's operations manual, based on a «safe job analysis». The work permit issued shall contain instructions to be followed when the work is carried out.

Amended by Regulations of 29 June 2007 No. 1006 (in force on 1 July 2007), 28 June 2016 No. 833 (in force on 1 July 2016).

## Chapter VII

### **Identification of accidental events and systems important for safety**

## Section 24

### *Identification of accidental events*

Through carrying out of the risk analysis, the company shall identify possible dimensioning accidental events with dimensioning accidental loads, in order to evaluate the overall risk picture of the unit.

1. For all mobile offshore units, the risk analysis shall as a minimum consider whether the following accidental events are relevant:
  - a) Collisions:
    - Collision with supply ship.
    - Collision with merchant ship.
    - Collision with fishing vessel.
    - Collision with standby vessel.
    - Collision with underwater craft.
    - Collision with drifting objects.
  - b) Incorrect weight distribution:
    - Shifting of deck cargo.
    - Shifting of ballast.
    - Icing.
  - c) Falling objects:
    - Shifting, falling deck cargo.
    - Falling crane booms.
    - Falling crane lifts.
  - d) Drift:
    - Line breakage.
    - Multiple line breakage/dragging anchor.
    - Failure of dynamic positioning system.
    - Winch failure.
  - e) Helicopter accident on the unit.
  - f) Hull/structural failure.
  - g) Fires in enclosed spaces:
    - Fire in accommodation spaces.
    - Fire in machinery spaces.
    - Fire in work rooms.
  - h) Explosions in machinery spaces and other equipment rooms.
  - i) Loss of control during transit:
    - Collision during transit.
    - Grounding.
    - Towing failure.
  - j) Incorrect operation of systems, including systems treating foodstuffs (storage method etc.) and potable water.
2. Accidental events to be specially considered for mobile offshore units engaged in exploration and production drilling:
  - a) Hydrocarbon blowout:
    - Shallow gas blowout on seabed.
    - Shallow gas blowout underneath drilling floor or in diverter system.
    - Reservoir blowout on drilling floor.
    - Blowout caused by various possible events.
  - b) fire due to release of hydrocarbons:
    - Fire in mudpit.
    - Fire in shaleshaker room.

- Fire in well stream testing system.
- c) Explosions due to release of hydrocarbons:
  - Explosion in mudpit.
  - Explosion in shaleshaker room.
  - Explosion in well stream testing area.
- 3. Accidental events to be specially considered for crane vessels:
  - a) Failure in dynamic ballasting systems.
  - b) Falling cargo.
  - c) Critical accidental events in connection with crane operations in general.
- 4. Accidental events to be specially considered for pipe-laying vessels:
  - a) Critical accidental events in connection with pipe-laying in general.
- 5. Accidental events to be specially considered for diving vessels:
  - a) Critical accidental events in connection with diving operations in general.
- 6. Accidental events to be specially considered for production vessels:
  - a) Release of hydrocarbons, etc.:
    - Release of hydrocarbons from processing equipment.
    - Release of hydrocarbons from risers, manifolds and cross connections to processing equipment.
    - Release of hydrocarbons from storage tanks.
    - Release of hydrocarbons from loading and unloading systems.
    - Release of SOx.
    - Release of NOx.
- 7. Accidental events to be specially considered for flotels:
  - a) Smoke and gas due to fire, release from nearby installations.
  - b) Accident involving gangway.
  - c) Narrow escape routes.
  - d) Evacuation possibilities, in view of a large number of persons, life-saving appliances etc.

Amended by Regulations of 11 April 2003 No. 501 (in force on 1 July 2003), 29 June 2007 No. 1006 (in force on 1 July 2007).

## Section 25

### *Systems important for safety*

A reliability/vulnerability analysis shall be carried out for vital operating systems and safety and emergency systems.

1. Vital operating systems are, inter alia:
  - Ballast/sounding system/watertight subdivision.
  - Anchoring and positioning system.
  - Electrical power supply.
  - Fuel oil system.
  - Drilling system.
  - Machinery monitoring system.
  - Ventilation of electronic equipment.
  - Ventilation of hazardous areas.
  - Potable water system.
  - Helicopter deck.
2. Safety and emergency systems are, inter alia:
  - Alarm systems.
  - Communication systems.
  - Well control system.
  - Emergency shut-down system.
  - Ventilation with damper system.
  - Structural safety systems, fire partitions, etc.
  - Fire pump system.
  - Fixed fire-extinguishing system.
  - Electrical emergency power supply.
  - Evacuation system.

Amended by Regulation of 11 April 2003 No. 501 (in force 1 July 2003), 28 June 2016 No. 833 (in force on 1 July 2016).

## **Chapter VIII**

### **Concluding provisions**

#### Section 26

##### *Entry into force*

These Regulations enter into force on 1 January 1994 for new mobile offshore units and on 1 September 1994 for existing mobile offshore units.

Amended by Regulation of 29 June 2007 No. 1006 (in force on 1 July 2007, previously section 27).