

**GUIDELINES TO REGULATIONS RELATING TO MANAGEMENT
IN THE PETROLEUM ACTIVITIES
(THE MANAGEMENT REGULATIONS)**

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**Petroleum Safety Authority Norway (PSA)
Norwegian Pollution Control Authority (SFT)
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CHAPTER I RISK MANAGEMENT

Re Section 1 Risk reduction

When choosing technical, operational and organisational solutions as mentioned in the first paragraph, the responsible party should apply principles that provide good inherent health, safety and environment properties as the basis for such selections. See also Chapter 5.4.1 and Appendix A of the ISO 17776 standard.

Situations of hazard and accident as mentioned in the first paragraph, constitute a collective term that includes both near-misses and accidents that have occurred, as well as other unwanted conditions that may cause harm, cf. the [Framework Regulations Section 9](#) on principles relating to risk reduction.

Barriers as mentioned in the second paragraph, may be physical or non-physical, or a combination thereof.

The requirement to independence as mentioned in the third paragraph, implies that several important barriers shall not be impaired or cease to function simultaneously, inter alia as a consequence of a single failure or a single incident.

Re Section 2 Barriers

The strategies and principles as mentioned in the first paragraph, should, inter alia, be formulated such that they contribute to giving all involved parties a common understanding of the basis for the requirements for the individual barriers, including what connection there is between risk and hazard assessments and the requirements on and to barriers.

In order to fulfil the requirement for stipulation of strategies and principles, the IEC 61508 standard and [OLF guidelines No. 70](#) revision 2 should be used for safety systems.

Performance as mentioned in the second paragraph, may, inter alia, refer to capacity, reliability, availability, efficiency, ability to withstand loads, integrity and robustness.

CHAPTER II MANAGEMENT ELEMENTS

Re Section 3 Management of health, environment and safety

Managing health, environment and safety as mentioned in the first paragraph, is one aspect of the management of the various petroleum activities, and can therefore be integrated into the management of these. The requirement thus does not necessarily entail the establishment of a separate management system for health, environment safety.

The management activities include, inter alia,

- a) stipulation of objectives, strategies and requirements,
- b) planning and execution,
- c) handling of non-conformities,
- d) measuring and evaluating,
- e) further development and improvement.

See also the NS-EN-ISO 9004 standard.

The requirement to a precise definition of responsibility and authority as mentioned in the second paragraph, applies to all forms of transfer of responsibility and authority, such as in connection with organisational changes and transitions from one phase to the next.

The requirement on preparing the necessary steering documents as mentioned in the third paragraph, implies that the internal requirements to scope, content and updating of documents must be adapted to the needs of the party responsible.

Re Section 4 Objectives and strategies

The requirement on the further development of objectives as mentioned in the first paragraph, implies that higher objectives shall be set in accordance with the degree of achieving objectives.

Concurrence between objectives as mentioned in the second paragraph, means that the objectives are consistent and not contradictory.

Re Section 5
Internal requirements

No comments.

Re Section 6
Acceptance criteria for major accident risk and environmental risk

Acceptance criteria mean the upper limit of acceptable risk relating to major accidents and risk relating to the environment.

Major accident means an accident involving several serious personal injuries or deaths or an accident that jeopardises the integrity of the facility.

Environmental risk means the risk of pollution, cf. the [Framework Regulations Chapter III](#) on principles relating to health, environment and safety.

In order to fulfil the acceptance criteria for major accidents as mentioned in the first paragraph and in the second paragraph literas a and b, the [NORSOK Z-013](#) standard Chapter 4 should be used.

When setting acceptance criteria relating to risk as mentioned in the second paragraph litera a, methods of averaging risk should be used to ensure that the acceptance criteria for the personnel as a whole and for exposed groups of personnel complement each other, see also the [NORSOK Z-013](#) standard Appendix A.2.1.4.

Acceptance criteria relating to environmental risk as mentioned in the second paragraph litera c, should be related to the facility and the effect on the individual environmental resources and the eco systems from the activities of the facility. When setting the acceptance criteria, a number of facilities should be considered in context to a large extent. The level of acceptable risk should be clarified in co-operation with other operators, if there be any, in the area that may be affected by the activities of the facility. When setting the acceptance criteria, the authorities' considerations with respect to the environmental basis that have been presented in, inter alia, reports to the Storting and in impact assessments for the area which may be affected by the activities of the facility, should be taken into account

Re Section 7
Monitoring parameters and indicators

The requirement in the second paragraph encompasses indicators for monitoring the most important risk factors and for monitoring the total risk, see also the [NORSOK Z-013](#) standard Chapter 5.5 and Appendix A.4.4.1 of the standard.

Re Section 8
Basis and criteria for decision

Comprehensively and adequately considered as mentioned in the first paragraph, means, inter alia, that reports, data and analyses that are included in the basis for decision, are of the necessary quality, that various alternatives and consequences of such alternatives have been examined, and that relevant professionals and user groups have been involved.

CHAPTER III
RESOURCES AND PROCESSES

Re Section 9
Planning

The plans as mentioned in the first paragraph, may be plans where health, environment and safety form an integrated part, or specific plans for health, environment and safety activities. Plans for maintenance or operation are examples of plans where health, environment and safety constitute an integrated part.

The resources as mentioned in the second paragraph, may include, inter alia, infrastructure, personnel and information.

Re Section 10

Work processes

Work processes mean a set of interacting activities that transform inputs into products, see also the NS-EN-ISO 9000 standard Chapter 3.4.1. Work processes may, inter alia, include engineering processes, maintenance processes, change or improvement processes.

The individual work process as mentioned in the first paragraph, should be designed according to the model for quality loops, see also Chapter 7 of the NS-EN-ISO 9004 standard.

The description as mentioned in the second paragraph should encompass the individual activities, the sequence of the activities and the input factors and products. Sequence and dependencies should be included in the description of interfaces between the processes.

Re Section 11

Manning and competence

Competence as mentioned in the first paragraph, encompasses both individual competence and group competence, including professional competence, system knowledge and health, safety and environment competence, see also the [Activities Regulations Section 19](#) on competence.

The requirement on manning and competence applies to both project and operational organisations, and implies that the manning must be sufficient to handle, inter alia, both activity peaks, operational interruptions and situations of hazard and accident. The manning shall also be sufficient to cover absence, including absence due to illness, the absence of key personnel and absence due to tasks carried out by the elected safety delegates, cf. the [Regulations 29 April 1977 no. 7 relating to safety delegates and working environment committees Section 4](#).

When setting minimum requirements as mentioned in the first paragraph,, consideration should inter alia be given to the need for mutual experience transfer, consultation, control and relief.

Incompatible tasks as mentioned in the third paragraph, may be tasks that are to be carried out simultaneously in the event of operational interruptions or in a situation of hazard and accident.

The requirement to review consequences as mentioned in the fourth paragraph, applies, inter alia, to changes in work forms and distribution of tasks, including between the land and offshore organisation, or in connection with stipulating manning for new or renegotiated contracts with contractors, cf. the [Framework Regulations Section 14](#) on qualification and follow-up of other participants.

Re Section 12

Information

Identifying as mentioned in the first paragraph, means determining who needs what type of information and when. The need for information will inter alia be given by the work processes and interfaces between these, cf. [Section 10](#) on work processes.

Acquisition as mentioned in the second paragraph, includes, inter alia, searching for internal and external sources of information.

Users as mentioned in the second paragraph, can be an enterprise's own personnel or external suppliers of services and equipment.

CHAPTER IV ANALYSES

Re Section 13

General requirements to analyses

The term analyses is used here in a broad sense of the word.

Specific requirements on the various analyses are stipulated in the other sections in this chapter and in the [Facilities Regulations](#) and the [Activities Regulations](#).

Recognised models, methods and techniques as mentioned in the first paragraph, mean those that have been tested and validated prior to use.

The requirement on using the best available data as mentioned in the first paragraph, implies, inter alia, that the data must be representative and valid. Limitations in the data basis should be shown and made accessible.

Target groups as mentioned in the third paragraph, mean, inter alia, decision-makers, employees and their elected representatives.

Other new knowledge as mentioned in the fourth paragraph, may be related to the data basis or to the connection between causes and possible consequences.

Re Section 14

Analysis of major accident risk

Analyses of major accident risk may be quantitative or qualitative.

In order to fulfil the requirements to major accident risk, the [NORSOK Z-013](#) standard Chapters 5, 6, 7 and 8 should be used. When analysing ship collisions, the [NORSOK N-003](#) standard Chapter 8.3.2 should be used also, cf, the [Facilities Regulations Section 10](#) on loads, load effects and resistance.

Re Section 15

Quantitative risk analyses and emergency preparedness analyses

In order to fulfil the requirements to quantitative risk analyses and emergency preparedness analyses as mentioned in the first and third paragraph respectively, the [NORSOK Z-013](#) standard Chapters 4.5 and 5 should be used in the area of health and safety, with the following additions:

- a) re first paragraph, litera a: when introducing new concepts or development solutions, emphasis should be placed on identifying new hazard situations that are unique to the new solution,
- b) re first paragraph, litera b: uncovering of possible common cause failures should be included in the modelling. The modelling should be such that changes in one part of the model are also correctly reflected in other parts of the model.

In order to provide a balanced and comprehensive picture of the risk as mentioned in the first paragraph, the external and internal incidents that the facility or transportation system is most vulnerable to, should inter alia be identified.

The effect of risk reducing measures should be calculated as far as possible.

Re Section 16

Environmentally oriented risk and emergency preparedness analyses

The environmentally oriented risk analyses as mentioned in the first paragraph, should employ the incident sequences that can result in acute pollution, cf. [Section 15](#), on quantitative risk analyses and emergency preparedness analyses first paragraph litera a. The initiating incidents should be ranked, inter alia by using drift and spread analyses. If applicable, the incident sequences should be supplemented with other types of incidents and conditions that also can result in acute pollution. Criteria should be set for selecting initiating incidents so as to cover the time periods when the eco systems or specially selected elements of the eco systems are more vulnerable to acute pollution.

Background load as mentioned in the first paragraph, means operational discharges from the facility, and information from regional impact assessments for areas where this is available. An overall evaluation should be made of the risk associated with background loads and acute pollution, cf. [Section 6](#) on acceptance criteria for major accident risk and environmental risk. The requirement to comparison of environmental risk as mentioned in the first paragraph, implies that the result of the risk analysis must have sufficient resolution and be presented in comparable categories.

Important information for carrying out environmentally oriented risk analyses include

- a) the physical, chemical and ecotoxicological properties of the pollution,
- b) the characteristics of the pollution,
- c) transport and spread,
- d) weathering,
- e) vulnerability of eco systems,
- f) meteorological data,
- g) environmental prioritisation map for vulnerable resources.

The way in which especially vulnerable environmental resources have been attended to, should be shown in the environmentally oriented risk and emergency preparedness analyses. As mentioned in the [Activities Regulations Section 64](#) on establishing emergency preparedness, a reasoned selection of defined situations of hazard and accident to be used in the emergency preparedness analysis, shall be made in such a manner that they in the best possible way also cover other situations of hazard and accident.

As mentioned in the [Activities Regulations Section 67](#) on emergency preparedness plans, an action plan with requirements and decision criteria should be established for each defined situation of hazard and accident.

The requirements to environmentally oriented risk and emergency preparedness analyses shall be seen in connection with the [Framework Regulations Section 9](#) on principles relating to risk reduction, [these Regulations Section 14](#) on analysis of major accident risk, [Section 15](#) on quantitative risk analyses and emergency preparedness analyses and [Section 18](#) on collection, processing and use of data and the [Activities Regulations Chapter X-I](#) on monitoring of the external environment.

Re Section 17

Analysis of the working environment

Necessary analyses mean inter alia analyses in connection with planning, operation and shutdown of facilities, in connection with modifications of existing facilities, in connection with purchasing or renting new equipment, when hiring in facilities, when entering into contracts with contractors or in connection with organisational changes in the enterprise.

In order to ensure a proper working environment, the various analyses should complement each other so that they cover both situations of hazard and accident as well as exposure to working environment factors. The analyses should use data on, inter alia,

- a) individual or group workloads and exposure to working environment factors of the personnel, as well as data on the perception of the employees of the physical and psychosocial working environment,
- b) working environment factors in the various areas of the facility,
- c) occupational diseases and industrial accidents.

In order to fulfil the requirements to analyses of the working environment, the [NORSOK S-002](#) standard revision 4 Chapter 4 and Annex G should inter alia be used when engineering new facilities and in connection with modifications. Assessments of psychosocial factors during engineering may be made in the form of comparison analyses using empirical data from the operations phases in comparable workplaces and areas of work.

In order to fulfil the requirements to analyses of the working environment, the ISO 11064 standard Part 1 should be used for design and manning of control rooms.

CHAPTER V MEASURING, FOLLOW-UP AND IMPROVEMENT

Re Section 18

Collection, processing and use of data

This section encompasses requirements to all types of data that are of significance to health, environment and safety. Specific requirements to data for various purposes are listed in other sections of these regulations, as well as in the [Framework](#), the [Activities](#), the [Facilities](#) and the [Information Duty Regulations](#).

To fulfil the requirements to data as mentioned in the first paragraph literas c and d, the ISO 14224 standard should be used for quantitative risk analyses in the area of health, working environment and safety.

Re Section 19

Recording, examination and investigation of situations of hazard and accident

The recording as mentioned in the first paragraph, should, inter alia, include a description of the situation, causal relation and the actual or potential consequence.

The investigation as mentioned in the second paragraph, should, inter alia, clarify

- a) the actual course of events and the consequences,
- b) other potential courses and consequences,
- c) existing non-conformities to requirements, approaches and procedures,
- d) human, technical and organisational causes of the situation of hazard and accident, as well as in which process and levels the causes may be found,
- e) which barriers have failed, the causes of barrier failure and, if applicable, which barriers should have been established,
- f) which barriers have functioned, i.e. which barriers have contributed to prevent a situation of hazard from developing into an accident, or which barriers have reduced the consequences of an accident,

g) which actions should be taken in order to prevent similar situations of hazard and accident.

The requirements to organisation as mentioned in the third paragraph, should inter alia indicate when contractors and suppliers should participate.

Re Section 20

Handling of non-conformities

Follow-up of non-conformities as mentioned in the first paragraph, may, inter alia, be handled in the established systems for maintenance administration, work permits, hazard and accident follow-up and in the system for handling of non-conformities. See also the NS-EN ISO 9004 standard Chapter 8.3.

Correction as mentioned in the second and third paragraph, means actions taken to eliminate a detected non-conformity. See also the NS-EN-ISO 9000 standard Chapter 3.

Corrective actions as mentioned in the second paragraph, mean actions to eliminate the cause of a detected non-conformity or other unwanted situation. See also the NS-EN-ISO 9000 standard Chapter 3.

Preventive actions as mentioned in the fourth paragraph, mean actions to eliminate the cause of a potential non-conformity or another potentially unwanted situation. See also the NS-EN-ISO 9000 standard Chapter 3.

Re Section 21

Follow-up

Follow-up means follow-up of one's own organisation, including system audits, management reviews, self-assessments, verifications, validations, measurements and mapping, see also the NS-EN-ISO 9000 standard Chapters 2.8, 3.8 and 3.9 and the NS-EN-ISO 9004 standard Chapter 8.2 and Appendix A of the standard in the area of health, working environment and safety.

Follow-up also encompasses follow-up of other participants' organisations, cf. the [Framework Regulations Section 14](#) on qualification and follow-up of other participants.

Re Section 22

Improvement

The identification as mentioned in the first paragraph, may, inter alia, be based on mappings and results of analyses, investigation of situations of hazard and accident, handling of non-conformities, experience from internal follow-up or experience gained by others.

As regards requirements to implementation of improvements, cf. also [Section 8](#) on basis and criteria for decision and [Section 10](#) on work processes. See also the NS-EN-ISO 9000 standard Chapter 2.9 and the NS-EN-ISO 9004 standard Chapter 8.5 and Appendix B.

Empirical knowledge as mentioned in the third paragraph, may, inter alia, encompass information on failures and deficiencies, as well as examples of good problem solving and practice.

CHAPTER VI ENTRY INTO FORCE

Re Section 23

Entry into force

See the [Framework Regulations Section 63](#) on entry into force and repeal of regulations no. 2 for an overview of which regulations are repealed when these regulations enter into force.

LIST OF REFERENCES

Standards and guidelines

International Electrotechnical Commission (IEC)

IEC 61508:1998 Functional safety of electrical/electronic/programmable electronic safety-related systems.

International Organization for Standardization (ISO)

ISO/IEC guide 51:1999 Safety aspects – Guidelines for their inclusion in standards

NS-EN-ISO 9000:2000 Systemer for kvalitetsstyring. Prinsipper og terminologi

<Quality management systems. Principles and terminology>

NS-EN-ISO 9004:2000 Systemer for kvalitetsstyring. Retningslinjer for prestasjonsforbedringer

<Quality management systems. Guidelines for improving performance>

ISO 11064:1999 Ergonomic design of control centers

ISO 14224:1999 Petroleum and natural gas industries Collection and exchange of reliability and maintenance data for equipment

ISO 17776:2000 Petroleum and natural gas industries – Offshore production installations – Guidelines on tools and techniques for hazard identification and risk assessment

ISO 15544:2000 Petroleum and natural gas industries – Offshore production installations – Requirements and guidelines for emergency preparedness

NORSOK

[NORSOK S-002](#) Working environment, revision 4, August 2004,

[NORSOK Z-013](#) Risk and emergency preparedness analysis, revision 2, September 2001,

[NORSOK N-003](#). Action and action effects, revision 1, February 1999.

The Norwegian Oil Industry Association (OLF)

[Guidelines for the application of IEC 61508 and IEC 61511 in the petroleum activities on the Norwegian continental shelf, no. 070](#), revision no. 02, 29 October 2004.