

Regulations relating to safe practice in exploration and exploration drilling for petroleum deposits on Svalbard. Stipulated by Royal Decree of 25 March 1988 by virtue of Section 4 of Act of 17 July 1925 no. 11, relating to Svalbard (Spitzbergen). Last amended 19 December 2003 no 1596.

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CHAPTER I INTRODUCTORY PROVISIONS

Section 1 Purpose

The purpose of these regulations is to protect people, the environment and property through provisions relating to matters of operational or technical character and of preparedness in connection with the activities mentioned in Section 2. Approval or permission according to these regulations may only be denied in cases of default with regard to the said matters.

Section 2 Scope

These regulations are applicable to safety in connection with exploration, exploration drilling for petroleum deposits or other exploration activities in accordance with The Mining Ordinance for Svalbard (Spitzbergen), where petroleum deposits may be encountered in onshore territories of Svalbard and in offshore areas extending to the territorial boundaries. The Petroleum Safety Authority Norway may decide that these regulations partly or in their entirety shall be applicable to production of petroleum.

The Petroleum Safety Authority Norway shall decide what activities shall be considered to be of such nature as to be comprised by the present regulations.

Section 3 Definitions

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

1. Petroleum: All liquid and gaseous hydrocarbons existing in their natural state in the subsoil, as well as other substances produced in association with such hydrocarbons.
2. Petroleum deposit: An accumulation of petroleum in a geological unit limited by the rock characteristics by structural or stratigraphic boundaries, contact surface between petroleum and water in the formation, or a combination of these, so that all the petroleum comprised is in pressure communication through liquids or gas.
In cases of doubt, the Petroleum Safety Authority Norway will determine what shall be regarded as a petroleum deposits.
3. Exploration drilling: Drilling of exploration and appraisal wells.
4. Production: Production of petroleum, processing and storage of same for transportation, as well as construction, placing and operation of installations for such activities, including the drilling of development wells.
5. Licensee: Person or company which in accordance with the provisions of The Mining Ordinance for Spitzbergen (Svalbard) by search licence and/or claim areas, has obtained the right to carry out exploration and drilling for petroleum deposits.
6. The Ministry: The Ministry of Labour and Government Administration, or anyone authorized by the said Ministry.
7. Official well identification: The identification determined by the Petroleum Safety Authority Norway.
8. Safety: In the present regulations, "safety" means operational, technical and emergency preparations significant for protection of people, the environment and the assets represented by the installations.
9. Quality: The compliance of products, services and activities with specified requirements.
10. Procedure: Established and documented course or mode of action.

Section 4 Coersive fines

The Petroleum Safety Authority Norway may impose coersive fines upon a licensee who fails to comply with orders within the time limit imposed. Such coersive fines must either be stipulated when the order is

imposed, or in connection with stipulation of a new time limit for compliance with the order.

The amount of the coercive fine shall be stipulated according to the importance of complying with the order, and the estimated costs involved. Coercive fines may be collected by distraint .

The Petroleum Safety Authority Norway may waive an imposed coercive fine when this is considered reasonable.

Section 5 Penal provision

Willful or negligent violation of these regulations or of regulations imposed by virtue of these regulations, is punishable by fines, cf. Section 339 subsection 2 of the Penal Code, except when more severe penal provisions applies to the case. Attempt and complicity is subject to the same penalty.

Section 6 Entry into force

1. These regulations enter into force on 1 May 1988.
2. Royal Decree of 23 July 1971 relating to provisional safety regulations etc. in exploration and drilling for petroleum resources etc. on Svalbard are repealed as from the same date.

CHAPTER II GENERAL PROVISIONS

Section 7 Requirements relating to prudent operations

Exploration and exploration drilling for petroleum deposits shall be conducted in a prudent manner in accordance with the provisions at any time in force.

Section 8 Authority to impose specific administrative decisions and to stipulate regulations

The Petroleum Safety Authority Norway may stipulate the regulations and impose the specific administrative decisions necessary for the execution of the provisions stipulated in and in pursuance of these regulations. The Petroleum Safety Authority Norway may stipulate terms in connection with specific administrative decisions. The Petroleum Safety Authority Norway may exempt from these regulations if special conditions make such exemption necessary or reasonable.

Section 9 Obligation to ensure compliance with provisions

Anyone carrying out such activities as mentioned in Section 2 is obliged to comply with the provisions of these regulations and orders imposed in pursuance thereof, and to ensure that such compliance is maintained in the activities.

The licensee has an overall responsibility to ensure that anyone performing work for him, either personally, through employees or through contractors or subcontractors, complies with the provisions imposed pursuant to these regulations. The same applies to specific administrative decisions made in pursuance thereof.

Section 10 Inspection, orders, suspension etc.

The Ministry or anyone authorized by the Ministry may appoint inspectors who are authorized to ensure that the operations are carried out in accordance with the regulations, conditions in the licence and the provisions stipulated in each individual case.

The inspectors shall at all times have access to areas where the activities are taking place, and to all data and material from the operations. The inspectors shall have the right to remain in the area for as long as they consider necessary.

The inspectors may point out violations and impose necessary orders. Orders shall be issued in writing, with a deadline for compliance. Orders and other specific administrative decisions shall be addressed to the licensee. If required for safety considerations, orders may be addressed directly to the person responsible at the drillsite.

In the event of serious or repeated violation of these regulations, of orders or conditions, or in cases where a continuation of the activities may entail serious hazard to life and health, or a risk of considerable pollution, the inspector may order the suspension of all or part of the operations. In such cases the inspector shall immediately notify the Petroleum Safety Authority Norway. The Petroleum Safety Authority Norway shall decide forthwith whether the ruling shall be upheld.

Section 11

Expenses for inspection and control of the activities

The licensee may be required to provide transportation for inspectors to and from the area, and to arrange for their stay. The Ministry may impose on the licensee to cover the costs of inspection and control of the activities.

Section 12

Notification

The licensee shall at all times keep the Petroleum Safety Authority Norway informed in writing, via the Governor of Svalbard, of the names, addresses and nationality of contractors or subcontractors carrying out activities for him in the areas mentioned in Section 2.

Section 13

List of persons working or staying at the drilling location

The licensee shall at all times keep a list of all the persons who are working or staying at the drilling location. The list shall be accessible to the Petroleum Safety Authority Norway and to the Governor.

Section 14

Use of the Norwegian language

If a request or communication addressed to Norwegian authorities is not presented in the Norwegian language, the authorities concerned may require a confirmed translation to be submitted within a stipulated time limit. If this cannot be complied with, the authorities concerned may disregard such request or communication.

Section 15

Security

The Petroleum Safety Authority Norway may, before the commencement of the activities and later, require that the licensee shall provide financial security for fulfillment of the obligations he has undertaken, as well as for possible liability in connection with the activities.

Section 16

Qualifications of personnel - training

The licensee shall ensure that all personnel involved in activities at the drill site have the necessary qualifications for proper and safe performance of the work they have been assigned. Training of employees shall take place to the extent necessary and under satisfactory supervision.

The licensee shall further ensure that all persons present on the installation or participating in the operations have adequate training and practice in connection with emergency preparedness situations.

Section 17

Reporting of major accident and emergency situations etc.

Major accidents and emergency situations shall be reported forthwith via the Governor to the Petroleum Safety Authority Norway, with information concerning the situation in question, the measures taken and the measures planned.

Section 18

Confidentiality

Anyone performing services or work for an administrative body shall be obliged to prevent unauthorized persons from gaining access to or knowledge of what they become acquainted with in their service or work about aspects of geology, reservoir engineering, drilling and operations on Svalbard from reports or other material submitted to public authorities. This duty shall apply for a period of five years from the time when the information became available to the authorities etc.

The Petroleum Safety Authority Norway may in particular cases grant exemption from this duty in consultation with the licensee.

In addition, the provisions regarding confidentiality in Sections 13 to 13f of the Public Administration Act are applicable to administrative bodies receiving or dealing with information or material about activities pursuant to these regulations, with the exception that the obligation to maintain confidentiality ceases after 20 years.

The provisions of the above paragraphs shall not prevent the Petroleum Safety Authority Norway from making general statements concerning the activities and the possibilities of finding petroleum deposits.

CHAPTER III EXPLORATION

Section 19

Exploration for petroleum deposits

Licensees may without special permission according to these regulations undertake the following types of exploration activities:

1. Magnetic surveys
2. Gravimetric surveys
3. Seismic surveys
4. Thermal conductivity measurements
5. Radiometric surveys
6. Geochemical surveys
7. General geological surveys

Report concerning such surveys shall be submitted via the Governor to the Petroleum Safety Authority Norway no later than six weeks prior to the commencement of the survey.

Section 20

Information concerning seismic surveys

In the case of seismic surveys, the following information shall be submitted via the Governor to the Petroleum Safety Authority Norway within the time limit referred to in Section 19:

1. Accurate information concerning the area where the exploration activities will take place
2. Description of exploration methods, as well as technical specifications concerning the exploration methods, instrumentation and processing
3. Description of how and in what form the results will be made available in the report

Section 21

Log

A daily log shall be kept of the surveys performed. In the case of seismic surveys, the log shall include information on the size of the explosive charges, the number of explosions and a precise indication of the shot points. The log shall contain information on any unexploded or partly unexploded charges. The log shall also contain information of importance for the question relating to the effects of the survey on animal and plant life. The Petroleum Safety Authority Norway and the Governor may require the log to be produced.

Section 22

Reporting

A report describing the extent of the survey, its implementation and results shall be submitted by the licensee to the Petroleum Safety Authority Norway via the Governor upon completion of each survey, or at the latest within three months after completion of the survey, providing important supporting documentation enclosed with the report.

The Petroleum Safety Authority Norway may require supplementary information.

CHAPTER IV

EXPLORATION DRILLING. SUBMISSION OF DOCUMENTATION

Section 23

Overall documentation

As soon as possible and no later than six months before the planned commencement of drilling and well activities the licensee shall submit the following documentation via the Governor to the Petroleum Safety Authority Norway. The documentation shall be submitted in duplicate:

1. Overall project description
2. Organization plan stating the line of responsibility for management of the total operation
3. Description and evaluation of the drill site location, cf. Section 27
4. Contingency plan, cf. Section 67
5. Plan for transportation services
6. Plan for and description of telecommunications installations, cf. Chapter V
7. Plan for the transport, storage and use of ionizing radiation equipment, cf. Chapter VI
8. Plan for fire prevention, cf. Chapter VII
9. Description of the drilling installation and its main systems and equipment with necessary drawings and specifications, cf. Section 25
10. Plan for reporting to the Petroleum Safety Authority Norway on matters relating both to geology and to drilling operations

Section 24

Changes and substantial deviations from submitted documentation

Substantial changes and deviations from earlier submitted documentation with regard to safety considerations, such as alteration in the setting depth of the casing, reduced strength of casing, change to directional drilling, alteration of plans regarding total depth etc. shall be subject to the same procedure as the original documentation with regard to obtaining permission, approval etc.

In emergency situations the work programme may be altered without prior permission. In such cases the Governor and the Petroleum Safety Authority Norway shall be informed forthwith of the alterations and of the underlying circumstances.

Section 25

Plans, specifications, information etc.

The following drawings, specifications, information etc. regarding drilling equipment and the drilling installation shall be submitted to the Petroleum Safety Authority Norway in duplicate:

1. Drawings of the derrick and substructure, stating construction standard and dimensions including anchoring arrangement
2. Type and rating of all hoisting equipment in the derrick, as well as pipehandling system
3. Drawings of the drilling installation showing the arrangement for railings, wind breakers, heating, lighting and access, as well as the arrangement of the escape system both from the drillfloor and the derrick
4. Arrangement and description of the drillfloor, indicating the location of equipment
5. Drawings showing the blowout preventer stack, the marine riser if any, the diverter system and the control system for the blowout preventer and diverter system, as well as the location of the control unit and operation panels for the blowout preventers. A list of the blowout prevention equipment kept on the drillfloor. Drawings of choke and kill lines with interconnecting lines to the choke manifolds, degaser, trip tank, ventlines, burners, drilling fluid manifold, cementing unit and main drilling fluid pumps
6. Arrangement of the equipment in the drilling fluid system, tanks, pumps, reconditioning system etc
7. Specification and arrangement of the pit level recording system and the flowline indicator, cf. Section 39
8. Specification and arrangement of equipment used for detecting inflammable gases, including hydrogen sulphide (H₂S)
9. Flow and function diagrams for the components mentioned in items 5-8
10. Drawings with description and location of fire fighting equipment
11. Technical specifications, description and standards used as basis for the construction of the drilling installation and related equipment

If substantial modifications or replacements are made in the equipment mentioned in items 1-11, new plans, specifications etc. concerning the equipment affected by such changes shall be submitted.

REQUIRED APPROVALS

Section 26

Approval of drilling installation with necessary equipment

The Petroleum Safety Authority Norway shall issue a written approval of the drilling installation and its equipment.

Section 27

Approval of drilling location

Activities at the drilling location may not be commenced until the written consent has been obtained from Petroleum Safety Authority Norway with respect to the position of the drilling location, the nature of preparatory work, temporary or permanent equipment, installations and buildings to be constructed etc. in connection with the planned petroleum activities.

The well must not be located closer than 200 meters to neighbouring property without written permission from the Petroleum Safety Authority Norway, cf. Royal Decree of 26 June 1970 relating to regulations on determination of claim area boundaries on Svalbard (Spitsbergen).

Section 28

Approval of plan for ionizing radiation equipment

A complete plan for the transportation, storage and use of ionizing radiation equipment, together with a description of the safety measures to be implemented, cf. Chapter VI, shall be approved by the Petroleum

REQUIRED PERMITS

Section 29

Drilling permit

The licensee must apply for a drilling permit through the Governor to the Petroleum Safety Authority Norway no later than three months prior to the planned commencement of the activities.

The licensee shall submit a drilling programme in duplicate, together with the application for a drilling permit.

Section 30

Drilling programme

The drilling programme shall include at least the following:

1. Well identification and position. The position shall be expressed by geographical coordinates
2. The RKB height above ground level with reference to sea level measured at the lowest astronomical tide. Any water depth and air volume in riser shall be indicated in the case of drilling activities in the offshore areas extending to the territorial boundaries
3. Name and type description of the drilling installation
4. Organisation plan covering all personnel involved in the operations, clearly stating responsibility, authority, functions and duties
5. Information regarding name, address and nationality as well the function of those persons/contractor companies expected to be employed for the planned drilling and well activities
6. A summary of possible drilling problems that may be encountered during drilling of the well, including an outline of precautions to be taken in this connection
7. An evaluation of the possibility of encountering shallow gas in the well in question, based on seismic data and possible neighbouring wells
8. A description of the equipment and the methods to be used by the licensee in order to ascertain the position of the well with sufficient accuracy at all times
9. Geological/geophysical prognoses for the drilling activities in question, such as structural map, evaluated seismic profile and anticipated lithology
10. Programme for collection of geological samples
11. Programme for core sampling, if applicable
12. Programme for well logging, containing details on types of logs expected to be run at the various well sections
13. Plan for submission of geological samples and well logs to the Petroleum Safety Authority Norway
14. A prognosis summary of pore pressure, formation strength and required specific gravity of the drilling fluid for the well in question, based on seismic data and experience from neighbouring wells
15. Evaluation of any possible abnormal formation pressures, and a description of the methods and procedures to be used for detection and handling of any such abnormal formation pressures
16. Work and time schedule for the operations
17. General description of procedures and equipment to be used in drilling the various well intervals
18. Specifications relating to type, dimensions and capacity for the blowout prevention and wellhead arrangements
19. Programme for testing of the blowout prevention arrangement, including specifications regarding pressure, extent and frequency
20. Programme for the use of drilling fluids, including details of type, specific gravity, viscosity etc
21. Programme for the setting of casings, with necessary underlying calculations demonstrating that the casing strings have sufficient strength with regard to burst, collapse, tension and bending for the

- planned setting depths
22. Programme for cementing the casing, with the necessary underlying calculations
 23. Programme for testing of all casings and their seal assemblies
 24. Description of procedure for pressure testing the formation strength at the shoe after drilling out of set casing, including calculations showing that the formation strength is sufficient for drilling to the next casing setting depth
 25. Plan showing blowout safety margins for the various well sections. Any possible trapped volumes shall be indicated
 26. Description of control system for the operation of the blowout preventers. Blowout prevention equipment on the drillfloor shall be specified
 27. Procedure for kick control of the well. The procedure shall include details on the use of the blowout preventers in such circumstances
 28. Programme for drills in connection with use of the blowout prevention arrangement
- Important safety equipment other than that mentioned in the present regulations shall if necessary be described giving specifications, sketches and operation procedures, and shall be included in the drilling programme.

Section 31 Testing permit

The licensee shall submit an application for a testing permit via the Governor to the Petroleum Safety Authority Norway no later than 14 days prior to the planned commencement of the activities.

The licensee shall forward a testing programme in duplicate enclosed with the application.

Section 32 Testing programme

As a minimum, the testing programme shall include:

1. Organization plan covering the personnel involved in the operations, clearly stating responsibility, authority, functions and areas of work
2. Information regarding name, address and nationality as well list of assignments for those persons/contractor companies expected to be employed during the testing operation
3. General well identification data
4. A summary of reservoir and production data necessary for dimensioning of the test-string with related equipment
5. Description of the purpose of planned testing, including test intervals and method
6. Summary of safety measures before testing
7. Procedures for implementation of the various project operations to be carried out
8. General outline of perforation and test-string with related equipment and safety equipment to be installed and used during operations. The type, main dimensions, capacity as well as depth reference where applicable, in respect of the various equipment components shall be included
9. Graphic log presentation

Important safety equipment other than that mentioned in the present regulations shall if necessary be described giving specifications, sketches and operation procedures, and shall be included in the testing programme.

Section 33 Permission for well abandonment

The licensee shall submit an application for permission to abandon and secure a well via the Governor to the Petroleum Safety Authority Norway no later than one week prior to the planned commencement of the activities.

Enclosed with the application the licensee shall forward a programme in duplicate for the abandonment

of the well.

In special cases the Petroleum Safety Authority Norway may, via the Governor, grant permission for temporary abandonment of a well. Such permission shall be limited to a period not exceeding six months. Application for an extension of the permission shall be submitted to the Petroleum Safety Authority Norway no later than 14 days prior to the expiry date.

Section 34

Abandonment programme

Programme for abandoning and securing the well shall as a minimum include the following:

1. An explanation as to why it is desirable to abandon the well, temporarily or permanently
2. Organization plan covering the personnel involved in the operations, clearly stating responsibility, authority, functions and duties
3. Information regarding name, address and nationality as well as a list of assignments for those persons/contractor companies expected to be employed for the operation including plugging and securing of the well
4. General well identification data
5. General outline showing the status of the well before plugging. Casings, open well section if any, tested intervals, cemented intervals as well as permanent equipment installed earlier etc. shall be indicated
6. Plan for abandoning and securing the well, with accompanying operational procedures. Equipment to be used shall be indicated. Planned cementing jobs shall be specified
7. General outline of the well after a permanent or temporary abandonment. Equipment which is planned to be installed or which may be abandoned, cemented intervals, plugs placed if any, perforations if any, cutting of casings etc. shall be indicated

DRILLING INSTALLATION AND EQUIPMENT

Section 35

General provisions

Installations, equipment, systems and components shall be constructed, equipped and located so they can be operated safely and withstand the loads anticipated in the operational surroundings in question.

Operation and maintenance of the equipment shall be such that adequate quality is maintained or compensated for in an alternative way.

Section 36

Derrick and substructure etc.

The drilling installation with accessory equipment shall be anchored and protected in such a manner as to be able to withstand the anticipated weather, wind and site conditions applicable in the area.

The derrick shall if possible be equipped with hydraulic or pneumatic equipment for pipehandling.

Equipment installed in the derrick and around the drillfloor shall be secured against falling down.

The derrick shall be equipped with a ladder or an elevator arrangement ensuring safe access to the different working platforms.

Ladders and working platforms shall be mounted in such a manner as to ensure that their use during operations is fully acceptable with regard to the safety of personnel.

The derrick shall be equipped with at least one escape system installed in such a manner as to lead away from the derrick and preferably on the side of the derrick opposite to the main access.

If a ventline is installed in the derrick, the top of the outlet shall be at a safe distance from the drilling installation. The burning of gas from the derrick ventline is prohibited.

Section 37

Drillfloor and cellar deck etc.

The drillfloor shall have at least two means of access.

All air winches shall be guarded and marked with the maximum permissible working load.

Air winches used for transportation of personnel shall be equipped with an automatic brake, and shall be marked "Transportation of personnel permitted".

The maximum permissible working load for a system of interdependent equipment shall refer to the weakest component of the system, e.g. winches, wire, hooks, pulleys etc.

Individual components such as sheaves, hooks, shackles, wire slings etc. shall be marked with the maximum permissible working load.

Making up and breaking out of drill pipe shall if possible be carried out by means of equipment operating on a hydraulic or pneumatic basis.

An upper kelly lock shall be installed below the swivel, and another one at the at the bottom of the kelly. These locks shall be of such design as to allow them to be run through the blowout preventer stack.

A backpressure type blowout preventer and an open/close drill string safety valve shall be located in open position on the drillfloor, ready for immediate use. The valves shall fit the pipes in use at all times.

Section 38

Hydraulic/Pneumatic equipment and bulk storage tanks

Hydraulic/pneumatic equipment shall be fitted with safety valves in order to prevent that the maximum permissible working pressure is exceeded.

All bulk storage tanks shall be equipped with a pressure relief system so as to prevent excess working pressure.

All pressure relief systems shall be capable of being tested. If bulk storage tanks are installed in enclosed spaces, such enclosed spaces shall be ventilated so as to ensure that a pressure build-up inside the space cannot occur.

Section 39

Drilling fluid equipment etc.

Drilling fluid reconditioning equipment shall be installed to the extent necessary, and shall be assembled in such a manner that the entire system can be run in series, i.e. in the following sequence: degasser, desander, desilter and centrifuge.

The total tank volume for drilling fluid shall be adequate for securing the well at all times.

In the case of shale-shakers and drilling fluid tanks located in enclosed spaces, these shall have the necessary equipment to vent away explosive and noxious gases and fumes.

Degasser ventilation pipe shall be connected to the ventilation pipe for drilling fluid/gas separator and shall be ventilated to a safe area.

Equipment for hydrocarbon gas detection shall be permanently installed. Gas detectors shall be located at least in the following places:

1. Area where shale-shakers are situated
2. Area where the drilling fluid tanks are situated
3. On the drillfloor

The equipment shall be connected to an audio-visual alarm system on the drillfloor, and shall clearly indicate where gas has been detected. The alarm shall be set for indication of 25 % and 75% of lower explosion limit.

Portable gas detectors shall be within easy access at the drillsite. Equipment for measuring and warning of hydrogen sulphide (H₂S) and other noxious gases shall be installed, with detectors situated in the same places as the hydrocarbon gas detectors. The equipment shall be connected to an audiovisual alarm on the drillfloor.

There shall be equipment for complete breathing protection for the number of persons required to

secure the well in the case of a danger situation.

The equipment shall be clearly marked and within easy access. The following control equipment shall be installed and in use during drilling:

1. Pit level indicator in drilling fluid tanks, registering drilling fluid volume
The pit level indicator shall be connected to an audiovisual alarm. As a minimum requirement such alarm shall be located on the drillfloor
2. Trip tank for control and registration of the drilling fluid balance of the well
3. Drilling fluid return indicator, which also registers the difference in volume between the discharged and the returned drilling fluid from the well
4. Registration unit registering pump pressure and rate
5. Registration unit registering the weight of the drilling fluid entering and emerging from the well
6. Registration unit registering the temperature of the drilling fluid entering as well as emerging from the well
7. Registration unit registering the gas content in the drilling fluid
8. Registration unit registering the penetration rate, the depth of the drill and the weight of the drillstring

Section 40

Blowout prevention and related equipment

The blowout prevention arrangement shall consist of at least the following:

1. One bag-type/annular preventer
2. One blind/shear ram preventer
3. Two pipe ram preventers capable of being closed around the drill string assembly

The preventers mentioned in items 2 and 3 shall be equipped with a mechanical or hydraulic locking device.

Section 41

The control system for the blowout preventers

The blowout preventers shall be connected to a control panel operable from a place easily accessible from the driller's stand. The control panel shall clearly indicate whether the blowout preventers are open or closed. Further the control panel shall indicate the required activating pressure and volume for the various functions and operations.

The blowout preventers shall be connected to an operations panel, which can be operated independently from the control panel on the drillfloor. This panel shall be located at a safe distance from the drilling area.

The control panel and the operations panel shall be connected directly to the main unit of the control system, and at the same time be independent of each other.

The main unit of the control system shall be located at a safe distance from the drilling area, but at the same time so as to be easily accessible from the drillfloor.

The accumulator capacity of the blowout preventers shall be sufficient for closing, opening and closing of all installed blowout preventers plus 25 % of one closing function of the said blowout preventers.

The control system of the blowout preventers shall be designed in such a way that each of the blowout preventers except annular preventers can be closed within 30 seconds. Annular preventers shall be capable of being closed within 45 seconds.

Section 42

Blowout preventers and choke manifold with related equipment

The blowout preventers and choke manifold with related equipment shall be designed so that fluid and gas can be conducted out of the system with adequate safety, and that necessary fluid can be pumped in.

Section 43

Diverter system with related control system

The diverter system shall be designed and arranged so that any fluid and gas may be conducted away from

the installation with adequate safety.

The diverter system shall have at least one securing element in case it becomes necessary to shut in the well. Such shutting in shall be possible with drill string as well as without drill string through the securing element.

The diverter system shall be equipped with a control system, which may be operated from a position easily accessible from the driller's stand.

The control system for the diverter system as well as the blowout preventers shall in situations of danger be selfsupplied with power, and shall not be adversely affected by loss of ordinary power supply.

Section 44

Emergency pump for drilling fluid circulation

If the drilling installation has only one main pump for drilling fluid circulation, or if several pumps are operated from the same power supply, the following shall be installed:

1. At least one diesel driven pump with sufficient working pressure and capacity for circulation of drilling fluid in emergency situations, or
2. at least one adequate diesel driven cementing unit, for circulation or drilling fluid, or
3. at least one emergency generator for the electrically driven pump system. This emergency generator shall be installed in a separate room, and shall have sufficient capacity to operate the electrical pump system in addition to other necessary equipment, which may be connected to the emergency generator.

For each of the alternatives mentioned above a feed pump system shall if necessary be connected to the same emergency energy supply system.

IMPLEMENTATION OF DRILLING AND WELL ACTIVITIES

Section 45

Drilling log

The drilling installation shall have a drilling log. One copy shall be retained at the drilling location until the drilling and well activities have been completed.

The drilling log shall be filled in after each shift, and shall give a relevant description of the work which has been carried out, as well as an account of any substantial safety related defects and faults which have been or will be corrected.

Section 46

Implementation of drilling operations etc.

Unauthorized persons may not be admitted to the drill site without permission from the licensee or someone authorized by the licensee. During stay on the drill site, visitors must comply with the safety regulations applicable to the operations. The licensee shall ensure that all visitors allowed access to the drill site are informed about the safety regulations in force.

During drilling and well operations, the licensee shall ensure that there is always a person in charge at the drillsite.

Equipment and systems shall be protected against excessive loads and pressures.

During operations, all necessary steps shall be taken to prevent fire, explosion, unintentional influx of formation fluid or gas into the well, loss of drilling fluid to the formation, pollution or injury or damage to personnel or equipment.

Adequate safety equipment for drilling and well operations shall be installed as required by the operations and otherwise as prescribed by these regulations.

If sulphurous or other poisonous gases are encountered, all necessary safety precautions shall be taken and the Petroleum Safety Authority Norway shall be notified immediately via the Governor.

The person responsible at the drillsite shall ensure that the following drills are carried out:

1. For each drilling crew, pit level drill with a view to necessary immediate measures to be taken in the event of abnormal pit level variations shall be carried out at least once a week. The drill shall include necessary appraisal of the stability of the well, and of possible implementation of diverter system/well closing operation
2. Drills covering the operation of blowout preventers and the precautions to be taken in the event of fluid/gas influx into the well during drilling and well activities, shall be carried out at least once a week. Drills as mentioned in items 1 and 2 shall be recorded in the drilling log

The Petroleum Safety Authority Norway may at any time require the well to be temporarily or permanently secured and closed, if this is deemed necessary from a safety point of view.

Apart from drilling prior to setting drive/structural/ conductor casing, drilling shall not be carried out before blowout preventers and related equipment have been installed.

During drilling operations the licensee is required to know the position of the well at all times. Measurements which determine inclination and azimuth shall be taken at intervals not exceeding 100 meters. Such measurements shall be commenced after the surface casing has been set, or at the depth the Petroleum Safety Authority Norway deems necessary.

Casing strings shall be installed in the well. The casing strings shall be set at depths justified by the geological conditions and the requirement to maintain complete control of the well at all times.

Drive/structural/conductor casing shall be set to such depth as to support unconsolidated formations and fluids and to provide a stable hole for initial and subsequent drilling operations. The drive/structural/conductor casing shall if possible be cemented over its full length.

Prior to drilling out of the drive/structural/conductor casing, a diverter system shall be installed, cf. Section 43.

Surface casing shall be installed in such a manner that good anchorage of the blowout prevention arrangement is secured. Surface casing shall if possible be cemented over its full length.

The cement shall be given sufficient time to set before further drilling is carried out.

A setting time test shall be carried out on the actual cement batch to be used.

Prior to drilling out of surface casing, at least one remotely operated bag/annular blowout preventer, one blind/shear ram preventer and two pipe ram preventers shall be installed, cf. Section 40.

Intermediate/protective casing shall be installed and cemented in such a way and at such a time that full control of the well is maintained at all times.

Intermediate/protective casing and innermost casing shall be cemented in such a way that the cement will isolate all zones containing hydrocarbons from each other, and so that all intervals with abnormal pressures are isolated from intervals with normal pressures. The top level of the cement shall be no less than 200 meters above the shallowest zone/interval or at least 200 meters above the casing shoe.

A liner shall be cemented over its full length.

A test of the quality of the cementing job shall be carried out after the cementing of surface casing and intermediate/protective casing, if these have not been cemented over their full length. After cementing of production casing and of liner, the cement bond log shall be run.

The installation of used casings is not permitted except when these have been inspected and adequate quality is documented.

Pressure testing of the formation strength below the casing shoe shall be performed in accordance with approved drilling programme.

The required amounts of drilling fluid additives, cement and water shall at all times be available at the drilling location in order to maintain control of the well.

Before the drillstring is pulled out of the hole, the well shall be observed and found to be stable.

During drilling, the drilling fluid reconditioning equipment shall be used to the extent necessary to separate gas and cuttings from the fluid.

Samples of the drilling fluid shall be taken at all times in accordance with the drilling programme, and at least every 15 minutes or more frequently if the conditions so demand. The result shall be documented.

When drilling is in progress, samples shall be taken of the cuttings from all rock types and all

geological formations penetrated. The sampling shall commence immediately after return of drilling fluid is established. The interval between the samples shall not exceed 10 meters, and shall further comply with the drilling programme. When drilling is carried out in geological formations, which may contain hydrocarbons, such samples shall be taken at least every 3 meters.

The following types of geological samples shall be submitted to the Petroleum Safety Authority Norway as soon as possible, and no later than 3 months after the samples have been taken:

1. Cuttings:
 - a) dried samples,
 - b) washed and dried samples
2. Cores when taken
3. Sea-bed samples when taken

Samples of cuttings shall consist of no less than 1/2 kg of material. Core samples shall consist of a complete longitudinal section of the core, containing at least one fourth of the core. The samples shall be marked in such a way that the level from which they were collected is clearly indicated.

Copies of descriptions and analyses carried out, including stratigraphic and lithological surveys, shall be forwarded to the Petroleum Safety Authority Norway as soon as they are ready, and no later than to be included with the final report, cf. Section 54.

Section 47

Pressure testing of blowout preventers

The blowout preventers shall be pressure tested to working pressure during initial and subsequent installations.

Blowout preventers shall be pressure tested to maximum expected pressure which the last installed casing may be subjected to, before continued drilling after this has been cemented and otherwise at least once a week during normal drilling and well activities.

Section 48

Pressure testing of choke manifold

At least once a week the choke manifold and related equipment shall be pressure tested to the maximum calculated pressures at any time expected in the well for as long as drilling and well activities are taking place.

In the case of replacements and major repairs of equipment this shall further be tested in accordance with the manufacturing standard of the equipment.

Section 49

Function testing of blowout preventers

Function testing of the blowout preventers shall be carried out in accordance with the programme, which the licensee has submitted earlier, cf. Section 30.

Pressure and function tests as mentioned in Sections 47 and 49 shall be performed/operated alternatively from the different control panels, cf. Section 41.

The results of the tests required by Sections 47, 48 and 49 shall be recorded in the drilling log.

Section 50

Implementation of the testing operation

In connection with formation testing, perforating, hydraulic fracturing, acidizing or other chemical treatment of the well, all necessary safety precautions shall be taken. The licensee shall ensure that no acid or other chemical fluid used in the operations will escape into the environment.

Before start-up of the operations, the drillfloor shall be cleared of all unnecessary obstacles. Only personnel needed for the operation shall be present on the drillfloor or its immediate vicinity. The blowout preventer stack shall be pressure and function tested. The teststring packer shall be pressure tested. Surface testing equipment shall be pressure tested. A safety meeting for all persons participating in the

operation shall be arranged before the operation is commenced.

Prior to perforating the well, extreme caution shall be exercised to prevent accidental firing, and radio equipment and other equipment, which may constitute a hazard to the firing operations, shall not be in use.

After termination of the activities, cleaning of the well and drillfloor shall be performed forthwith.

Oil samples in connection with formation testing shall be forwarded to the Petroleum Safety Authority Norway in accordance with earlier submitted programme, cf. Section 32.

Section 51

Abandonment of wells

Plugging and abandonment shall be conducted after the well has been drilled and after any test.

When a well is abandoned, casing and cement in the well shall not be removed or destroyed before permission to abandon the well has been granted by the Petroleum Safety Authority Norway.

In those parts of the well where casing may not have been installed, and where fluid or gas has been found in permeable zones, cement plugs shall be placed in order that zones containing fluid or gas become isolated from each other and from the well. The top of each cement plug shall be located and load tested.

Where there is an open hole below the deepest string of casing, a cement plug shall be placed in such a manner that it extends at least 50 meters above and below the casing shoe. The top of the cement plug shall be located and load tested. If the condition of the formation makes cementing difficult, a mechanical plug may be positioned in the lower part of the casing. A cement plug at least 20 meters long shall be placed on top of the said plug. The abovementioned plugs shall be pressure tested with a sufficient pressure differential.

Perforated zones shall if possible be squeeze cemented and shall be isolated by means of a mechanical plug. If squeeze cementing is not possible, a cement plug shall be placed in such a way that the upper and lower ends of the plug are located at least 50 meters above and below the perforated zone respectively, or down to the nearest plug if the distance is less than 50 meters.

If a liner has been used, a cement plug shall be placed in such a manner that the plug extends 50 meters above and below the point of suspension.

There shall be no communication from open formation to the wellhead via any annular space between two sets of casing strings. In cases where the cement is not brought at least 100 meters into previously set casing, the last casing string shall be perforated 100 meters above the shoe of the previously set casing string, and be squeeze cemented with a volume at least equal to a cement column of 100 meters in the annular space.

A cement plug of a minimum length of 200 meters shall be placed so that the top of the plug will be 50 meters or less from the wellhead. The lower part of the plug shall be cemented into the inner casing. For drilling on land, the top plug shall be cemented all the way up to the surface.

The well, including the space between the cement plugs, shall be filled with drilling fluid or other fluid of such weight and other properties that will enable the fluid to withstand, together with the plugs, any pressure that may develop in the well.

When a well is permanently abandoned, the part of the casing string and other installations extending above the surface shall be removed. Prior to abandoning the drill site, the licensee shall by a separate inspection ensure that no obstruction of any kind, caused by his activities, which may damage or impede other activities, is left behind at the drill site.

When casing is cut to remove the wellhead, this shall be done mechanically. The use of explosives is not permitted.

Confirmation of completed inspection shall be submitted to the Petroleum Safety Authority Norway via the governor within 3 months after securing and plugging of the well, cf. Section 54.

The Petroleum Safety Authority Norway may stipulate specific requirements to inspection and documentation.

In case of temporary abandonment, the same procedure as specified above shall be followed, with the exception of the requirement for a top plug of 200 meters. In the case of temporary abandonment, a mechanical bridge plug shall be placed in the smallest casing string at a distance of 200-300 meters from

the wellhead. The wellhead shall be adequately covered.

Both temporarily abandoned and permanently abandoned wells shall be marked in accordance with Section 52 of these regulations.

Section 52

Marking of abandoned wells

After the well has been secured and abandoned, it shall be marked indicating both the name of the licensee and the official well identification.

In land areas the marking shall be carried out with an easily visible iron rod about 2 meters long, fitted with a red sign measuring at least 20 by 20 centimeters, attached to its top. The rod with the plate shall be anchored as close to the abandoned well as possible.

REPORTING

Section 53

Reports to the Petroleum Safety Authority Norway

The licensee shall for the duration of the operations submit written progress reports to the Petroleum Safety Authority Norway. Such reporting to the Petroleum Safety Authority Norway shall if possible take place every day and otherwise at least once a week.

The report shall be in accordance with a form issued by the Petroleum Safety Authority Norway.

Section 54

Final report

The licensee shall submit a final summary report to the Petroleum Safety Authority Norway via the Governor, within 3 months after the well has been secured and abandoned.

The report shall be submitted in duplicate.

The final report shall at least include the following:

1. Information about the name of the licensee, official well identification, final position of the top and the bottom of the well etc.
2. Summary of all drilling and well activities
3. Final geological and geophysical interpretations of the entire well
4. Confirmation on completed inspection after cleaning up at the drilling location
5. A summary of logs consisting of the most important electrical logs and a description of the lithology of the well

CHAPTER V

TELECOMMUNICATIONS EQUIPMENT

Section 55

Approval and inspection of telecommunications equipment

The drill site shall be provided with the necessary equipment for telecommunications.

The legislation at any time in force concerning telecommunications installations and their operation shall be applicable to the installation of such telecommunications equipment. Before such equipment is put into service, it shall be approved by the appropriate Norwegian telecommunications authority.

Inspection of telecommunications installations shall be carried out as frequently as deemed necessary by the appropriate Norwegian telecommunications authority.

Section 56

Operation and maintenance of radio installation

The radio installation shall operate only on approved frequencies and at the approved power output, and otherwise in compliance with the conditions laid down in the radio communications licence issued for the installation.

The radio installation shall be maintained and operated in accordance with the international conventions in force to which Norway is a party, and in accordance with the Norwegian legislation in force at any time.

Section 57

Qualified radio operator

The radio installation shall be operated by a radio operator holding an approved certificate in accordance with the Norwegian legislation in force at all times.

CHAPTER VI IONIZING RADIATION EQUIPMENT

Section 58

Requirements in respect of transport, storage and use of ionizing radiation equipment

During transport, storage handling and use of ionizing radiation equipment, due care must be observed in order to avoid harmful effects to human life and health or animal and plant life, and further in accordance with the Norwegian legislation in force at all times.

Section 59

Notification of lost or mislaid ionizing radiation equipment

If ionizing radiation equipment is mislaid or lost, the licensee shall notify the Governor and the Petroleum Safety Authority Norway without delay.

Section 60

Marking and storage of ionizing radiation equipment

Ionizing radiation equipment and its packaging shall be marked with respect to the danger of radiation. The same applies to storage rooms at the drillsite and to the means of transport.

When not in use, ionizing radiation equipment shall be kept in securely locked rooms. In addition the necessary measures shall be taken to prevent such equipment from being lost or mislaid.

CHAPTER VII FIRE PREVENTION

Section 61

Fire-fighting equipment

Fire-fighting equipment of such type and capacity as to enable effective fire fighting operations, shall be available at the drillsite. The equipment shall be placed in suitable locations and ready for immediate use.

Section 62

Observant practice requirement

Due care and attention shall be observed by all persons with regard to anything that may cause fire. Special care must be shown in the storage and use of flammable equipment and materials such as

explosives, flammable liquids and gases, substances subject to self ignition etc

Section 63

Fire chief and fire-fighting squad

At each drillsite a fire chief shall be appointed. A fire-fighting squad shall be organized consisting of a sufficient number of persons having received training in efficiently fighting fires and in preventing and reducing the effects of an explosion with the equipment at hand.

Fire prevention drills shall be carried out every week.

The drills held and inspections of fire-fighting equipment shall be recorded in the drilling log.

Section 64

Procedures for detection and alarm in the event of fire

Adequate procedures shall be established at the drillsite to ensure to the extent possible the immediate detection and proper alarm in the event of fire.

The drillsite shall be equipped with a fire alarm system, which can easily be noticed in the entire area.

Section 65

Use of fire, naked lights or working operations causing sparks

Use of fire, naked lights or working operations causing sparks are permitted only in places where such activities will not create danger of fire or explosion, and only with the consent of the person responsible at the drillsite in each separate case.

CHAPTER VIII CONTINGENCY

Section 66

Contingency for major accidents and emergency situations

The licensee shall at all times maintain an efficient state of preparedness with a view to being able to meet major accidents and emergency situations which may involve loss of human life or personal injury, pollution or serious damage to property. The licensee is responsible for ensuring that the necessary measures are taken to prevent or minimize any harmful effects, including what is necessary in order to as far as possible bring the environment and the equipment back to the condition existing prior to the accident. The Petroleum Safety Authority Norway and the Governor may lay down rules concerning such contingency and measures, and also order common contingency efforts for several licensees.

Section 67

Contingency plan

The licensee shall prepare a contingency plan for use in the event of major accidents or emergency situations as mentioned in Section 66.

The contingency plan shall be based on the best methods and the best equipment existing at any time. In addition to the emergency equipment located at the drillsite, adequate equipment shall at all times be available from bases in the area.

The equipment shall be inspected regularly and shall be kept in good condition. Sufficient personnel shall be especially trained in the use of emergency equipment. The contingency plan shall be kept continuously up to date, and shall be made known to all involved personnel. The plan shall be included in the overall documentation, cf. Section 23.

Substantial alterations shall be submitted as soon as possible to the Petroleum Safety Authority Norway via the Governor. These authorities may at any time require alterations in the plan.

The contingency plan shall at least contain the following:

1. An organization plan clearly stating the structure of responsibility and line of command as well as the individual person's area of responsibility in the event of major accidents and emergency situations
2. A plan for and a summary of equipment to combat the particular accident or emergency situation, clearly stating e.g. the make and type of the equipment, its capacity, location, type of transport, field of operation and correct operation
3. An action plan clearly describing alarm and communication systems, including a system for notifying the authorities, each person's duties, when and how the emergency equipment is to be employed and action carried out, measures for limiting the harmful effects of the accident or emergency situation in question and rules for terminating the action

Section 68

Taking command in major accidents emergency situations etc.

If necessary the Governor may, in consultation with the authorities concerned, take command of the operation completely or in part in order to bring the situation under control in the event of major accidents or emergency situations.

In the event of such actions the licensee shall place the necessary equipment and personnel at his disposal free of charge.

Section 69

Co-operation on preparedness

The licensee is obliged to co-operate with other licensees in measures to ensure the necessary state of preparedness in the event of major accidents and emergency situations, and to participate to the necessary extent in financing co- operative contingency.

Section 70

Special accident situations etc.

In the event of blowout, fire or explosion one or several representatives from the Petroleum Safety Authority Norway and the Governor shall at all times have the right to observe the combat operations of the licensee.

In addition, the Governor and the Petroleum Safety Authority Norway shall be kept up to date at all times with regard to the situation and all measures taken until the operations are called off.

APPENDIX

Report form (weekly report)

REPORT NO.: Report period:
(from - up to and including)

A General information

- A 1 Date:
- A 2 Name of licensee:
- A 3 Drilling installation:
- A 4 Name of location/well:
- A 5 No. of days accumulated since start of drilling:

B Operational summary

- B 1
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B 2 Lithological description of perforated interval:

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C Specification of data (every day) Date:

C 1 Depth of well (true vertical depth):.....(m)

C 2 Measured depth of well (directional drilling).....(m)

(Deviation:

C 3 Equivalent pore pressure:

C 4 Weight of drilling fluid into the well:SG

Weight of drilling fluid out of the well:.....SG

C 5 Drilling fluid temperature into the well:.....(°C)

Drilling fluid temperature out of the well:.....(°C)

C 6 Short description of drilling and well activities:

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C 7 Lithological description of interval drilled:

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D Other specifications (if applicable)

- D 1 Setting of casing, including size, weight and type of casing, and setting depth.
- D 2 Cementing, including weight of cement, volume and height of cement in the annular space.
- D 3 Formation strength test.
- D 4 Pressure tests, including all pressure tests of blowout preventers with equipment and casing etc.
- D 5 Logging, including what interval of the well, which has been cored.
- D 6 Perforation, including the interval perforated.
- D 7 Formation fracture and acidization of the formation, including the pressure and acid tests performed.
- D 8 Plugging and any possible abandonment of the well including type of plugs and depth.

E Equipment faults (if applicable)

Information concerning faults in equipment including details on type of equipment, capacity and limitations, how the equipment was used and type of fault.

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F Personal injury/accidents (if applicable)

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G Any comments/additional information

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