Recommended practice for establishing and working in the red zone on the drill floor

6 May 2019

Translated version

FOREWORD

After discussion in the Drilling Managers Forum (DMF), the decision was taken to establish a recommended practice for working in the red zone on the drill floor in the industry. Work in this area involves a substantial risk of serious incidents related to remotely operated equipment and dropped objects.

It transpires that operators and rig owners have differing procedures and practices for performing such work. This is considered to be inappropriate, particularly for personnel who work on different installations. A work group was established to review the companies' procedures and practices and to produce a recommended practice for establishing and working in the red zone on the drill floor.

The recommended practice should be viewed in connection with Norwegian Oil and Gas guideline 081 – recommended guidelines for remote pipe handling operations.

The manager drilling is responsible for the practice.

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CONTENTS

1 INTRODUCTION

1.1 Purpose

This document describes a recommended practice for establishing a red zone on the drill floor and for performing work in this area. Attention is concentrated primarily on risk associated with remotely operated equipment and dropped objects. The practice covers the design of the drill floor, establishing the red zone, planning activities, and executing work and controlling personnel in this zone.

Each operator/rig owner should establish their own procedures covering the design of the drill floor, establishing the red zone and planning activities as well as executing work and controlling personnel in the red zone. This practice provides guidance on how these procedures are to be established. It is also suitable for incorporation in company management systems.

1.2 Definitions and abbreviations

Anti-collision	A system which monitors the positions of pipe handling machines and prevents them coming into contact with each other
Barrier	A measure intended to identify conditions which may lead to failure, hazard and accident situations, prevent an actual sequence of events occurring or developing, influence a sequence of events in a deliberate way, or limit damage and/or loss
DOP	Drilling operating procedure
Downhole tool	Tool which has been run into the well to perform a function within it
Driller	Person responsible for leading operations on the drill floor or the auxiliary drill floor
Drilling contractor	The company responsible for drilling on a fixed facility
Exposed zone	A defined zone where people could be exposed to dropped objects, equipment in motion in connection with wireline operations, and rigging of equipment which includes work in the vicinity of suspended loads
FMEA	Failure mode and effects analysis
FMECA	Failure mode, effects and criticality analysis
Line of fire	An expression used to ensure that personnel are not in a position which exposes them to energy-related hazards, such as movable equipment

Operational barrier element	The actions or activities which personnel must perform to realise a barrier function
Organisational barrier element	Personnel with defined roles or functions and specific competence involved in the realisation of a barrier function
Red zone	The red zone is a fixed area of the drill floor which is within the reach of remotely operated pipe handling equipment, including the drilling machine, and the possible drop zone of objects dropped in connection with operating the equipment. This zone shall not be adjusted when carrying out standard operations with the equipment. It shall apply at all times
Red-zone Hazid	A hazard identification (Hazid) conducted in accordance with ISO 17776 specifically to identify hazards associated with work in the red zone
Remotely operated pipe handling system	Remote operation of equipment associated with the pipe handling system, normally comprising pipe deck crane, pipe store, catwalk machine, pipe handling system in the derrick, fingerboard and iron roughneck
Rig owner	The company responsible for operating a mobile facility
Safe job analysis (SJA)	A systematic, step-by-step review of hazards carried out before a work operation. It must be conducted to identify, remove or control risk
Safe area	An area where personnel are not exposed to immediate danger from moveable equipment and dropped objects from the derrick
SDLA	Specially designed lifting appliances. See NORSOK R-002
Shall	Verbal form used to indicate a requirement in order to achieve the intention
Should	Verbal form used to indicate that one possibility among several is recommended
Technical barrier element	Equipment and systems involved in the realisation of a barrier function
Well work	Activity carried out on an oil, gas or injection well, such as a pumping, wireline operations, coiled tubing or a hydraulic workover (snubbing)

1.3 References

- Norwegian Oil and Gas guideline 081
- Norwegian Oil and Gas guideline 090
- NORSOK D-001
- NORSOK D-007
- NORSOK R-002
- NORSOK R-003
- NORSOK S-001
- NORSOK Z-008
- NORSOK Z-013
- ISO 17776
- DNVGL-OS-A101
- DNVGL-OS-E101
- Norwegian Oil and Gas handbook for applications for consent for well operations from a mobile facility
- Working Together for Safety (SfS) – Recommendation 024N/2018 Prevention of falling objects
- Norwegian Oil and Gas handbook on safe handling of wireline equipment on deck
- Petroleum Safety Authority Norway (PSA) – Barrier memorandum 2017

1.4 Accident prevention

Understanding of the causes of accidents has developed from a simple perspective to a more systematic approach. Looking solely at technical faults or human actions is insufficient for understanding the causes of accidents. Organisational factors are now considered to occupy a central place among accident causes, which means that accident prevention efforts should concentrate on these aspects – particularly when investigating incidents. The companies should identify and follow up measures aimed at improving these factors.

An important factor in preventing human error is the way in which teams function, and how a team which works well together can reduce errors which could lead to failures.

Many serious accidents have occurred on the drill floor, and a number of these relate to work in the red zone. Among the most important direct causes are planning failures, inadequate procedures for red-zone work and insufficient follow-up of and compliance with procedures. Drill-floor incidents can be used in planning and execution of red-zone work. They can also be relevant for drill-floor design and establishing the red zone.

Since work culture is a factor in incidents and accidents, highlighting this is important in prevention efforts. Two cultural factors viewed as important for this practice are:

- how the organisation complies with procedures, particularly those related to work in the red zone
- how managers communicate their expectations that procedures will be complied with

Leadership is an important factor in achieving an open discussion about procedures and practice and the need for possible changes to these. An open reporting culture represents an important contribution to continuous improvement.

Investigating incidents can provide an insight into the culture and contribute to the way this should be developed to avoid such incidents and accidents.

1.5 Barriers and barrier strategy

The Petroleum Safety Authority Norway (PSA) has published a memorandum on *Principles for barrier management in petroleum activities*, which contains definitions and describes the systematic approach to protecting against failures, hazards and accidents. This approach is relevant for planning and executing work in the red zone.

Figure 1.1 presents the context for the way barriers can be established and the way performance requirements can be established and followed up.

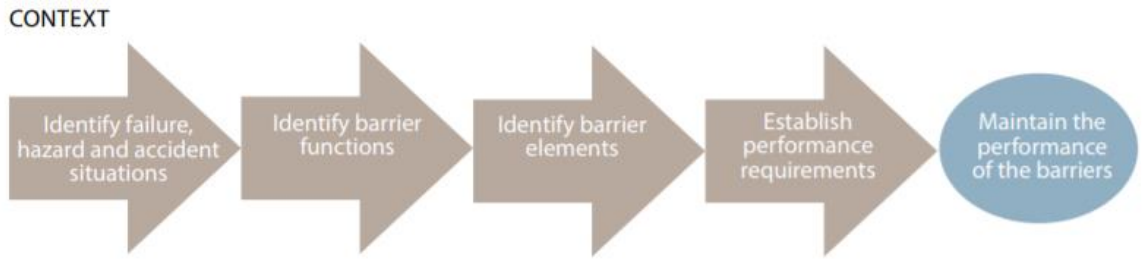


Figure 1.1 Context for barriers.

The concept of *following up barrier performance in a good way* means verifying that the barrier has functionality (will perform as intended), integrity (will have adequate reliability) and robustness (has sufficient redundancy and is not vulnerable).

Figure 1.2 presents the relationship between barrier function, barrier elements, performance requirements and factors influencing performance.

Figure 1.2 Relationship between barrier function, barrier elements, performance requirements and factors influencing performance.

The purpose of these figures is to demonstrate that effective barriers depend on technical, operational and organisational barrier elements. All these shall be assessed to ensure that the barriers can function satisfactorily. That also applies to the barriers related to work in the red zone on the drill floor.

2 MAIN PROCESSES

The main processes related to work in the red zone on the drill floor are:

- design of the drill floor
- establishing the red zone
- planning activities
- executing work and controlling personnel in the red zone.

A flow diagram has been developed for each process.

Figure 2.1 shows the relationships between the main processes related to the red zone and other processes involved in drill-floor design, establishing the red zone, planning work operations and activities on the drill floor, and executing activities and work operations on the drill floor.

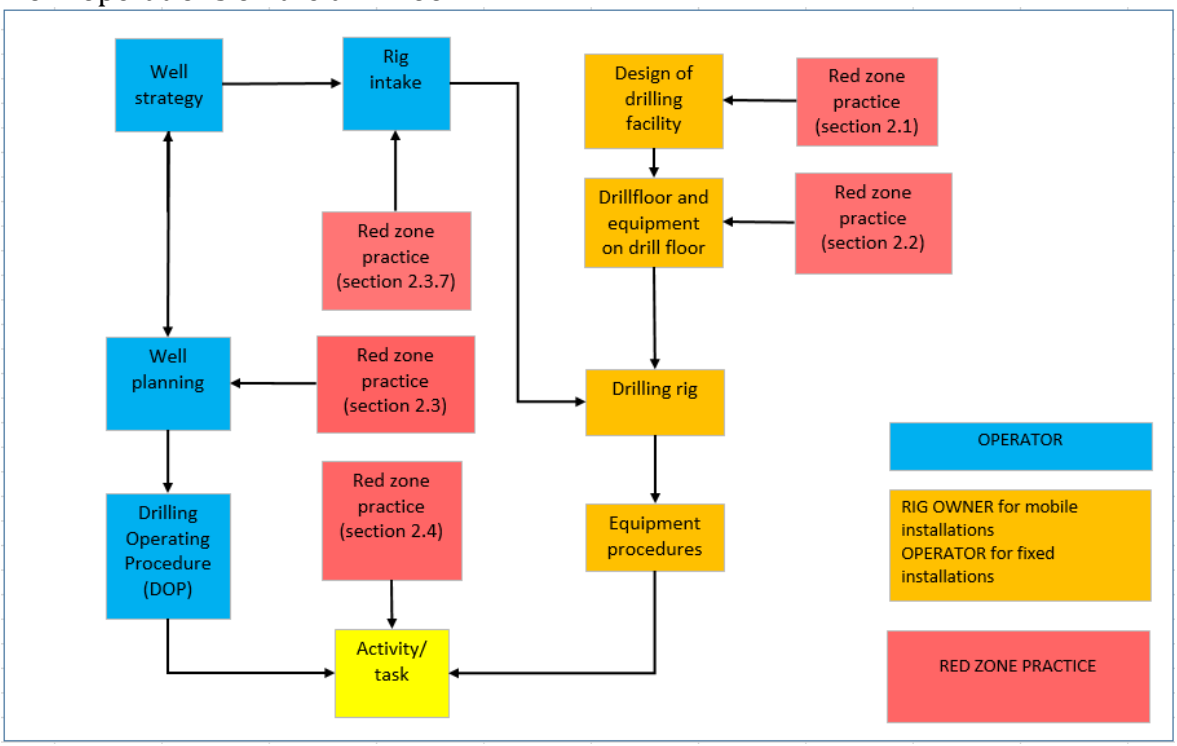


Figure 2.1 Relationship between red-zone processes and other processes.

2.1 Drill-floor design

This section is a contribution to the design of a new drill floor, choice of equipment and major modifications to the existing drill floor, including modifications to the pipe handling system. Figure 2 presents elements in the process of managing work in the red zone when designing a drill floor.

The chapter should be viewed in connection with Norwegian Oil and Gas 081 – recommended guidelines for remote pipe handling operations.

NORSOK R-002 annex B should be used when making provision for material handling. Minimising manual work operations and taking account of protection for personnel working there are important when designing the drill floor and choosing equipment.

Establishing the red zone and personnel requirements for access to this area should form an element in drill-floor design.

Striking a balance between efficiency and safety is one of the challenges in drill-floor design. Efficiency can be enhanced by being able to perform several operations on the drill floor simultaneously. Parallel operations should be carefully assessed in the design phase to ensure that one operation does not restrict safety and other operations. It could be appropriate to draw up a matrix for parallel operations to show which operations can be executed in parallel and what risk assessments and checks shall be in place before they are carried out.

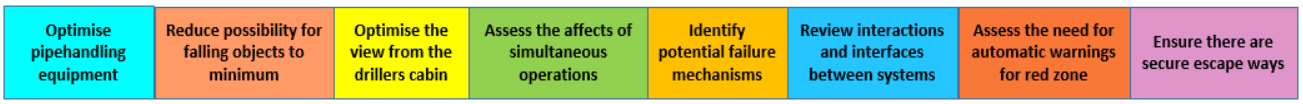


Figure 2.2 Elements in the process for dealing with red-zone work when designing a drill floor.

2.1.1 Main principles

- The system shall be designed so that no single error or failure can cause a serious accident.
- All pipe handling shall be remotely operated.
- Minimise manual work operations on the drill floor to reduce red-zone exposure.

It is important that the person responsible explicitly specifies clear objectives for drill-floor design.

2.1.2 Equipment design

Equipment and its controls should be designed to minimise manual operations on the drill floor as far as possible. Downhole tools should be tailored to the remotely operated equipment on the rig.

Drill-floor systems should be designed to minimise the possibility of dropped objects. That covers everything from the strength of load-bearing structures to securing equipment and objects. NORSOK R-002 describes processes and measures which should be implemented to secure equipment components.

People waiting to enter the red zone shall be protected against dropped objects and out of the line of fire.

2.1.3 Access path around red zone

It shall be possible for personnel to move around the drill floor during all drilling operations without entering the red zone. Equipment, gangways and stairs shall be positioned so that natural access is provided without crossing or having to enter the red zone.

2.1.4 Optimising the view from the driller's cabin

Responsibility for controlling access to the red zone lies with the driller. Designing the drill floor and driller's cabin to give the driller a good view of personnel working in the red zone and the point where they enter this zone is important.

2.1.5 Entry to the drill floor

A drill floor may have several entry points. One should be designated as the main entrance, and be used by everyone working on the drill floor. It shall be clearly marked and ensure that personnel can safely reach the driller's cabin without entering the red zone.

2.1.6 Mapping operational risk

Facilities on the drill floor are operated by the control system. Any remotely operated equipment can begin moving unintentionally as a result of a component fault or human error. It is important that all systems are investigated to reduce the probability of faults/errors and ensure that these will not have serious consequences. Possible fault mechanisms should be identified so that operators understand their consequences and how the equipment will move in the event of faults. The most appropriate methods for exposing faults and their consequences should be identified for each system using such approaches as design risk assessment, FMEA, FMECA and so forth.

Faults and their consequences are inputs to the Hazid for establishing a red zone and for preparing operational procedures.

2.1.7 Interaction between different systems

An overall assessment of the way drill-floor systems influence each other should be carried out. All interactions and interfaces important for safe operation should be described in the procedures, so that personnel using equipment are aware of them. The intention is to avoid unexpected movement of or action on a system from an operation carried out on another system.

Protection against collision and any interlock system (anti-collision system) shall be automated.

2.1.8 Automatic warning

An assessment should be made of whether a warning system – such as a light – is appropriate for indicating when equipment is in motion or systems are in operational mode and energised.

Automated systems for preventing collisions between people and machine are also under development and should be assessed in order to ensure that personnel do not come into contact with moving equipment.

Automatically halting equipment – by using laser beams and photocells, for example – when personnel enter the red zone should be considered.

2.1.9 Secure escape routes

Personnel working on the drill floor shall be provided with secure escape routes for evacuating the drill floor in an emergency. Possible cordons to prevent access to the red zone shall not restrict opportunities to escape.

2.2 Establishing the red zone

This chapter describes how the red zone on the drill floor of both fixed and mobile facilities should be established. Figure 2.3 presents the elements involved.

Figure 2.3 Elements in establishing a red zone.

The red zone shall not be adjusted when conducting standard operations with the equipment. It shall apply at all times.

2.2.1 Main principles

All activities and work operations which could be carried out on the drill floor shall be covered by a Hazid. This is known as the red-zone Hazid.

Attention in a red-zone Hazid will concentrate primarily on protecting personnel from moveable equipment and dropped objects.

2.2.2 Red-zone Hazid

Establishing a red zone shall be based on a Hazid. The Hazid shall be carried out to ensure that all hazards are identified and assessed, and that possible measures are taken into account. It should be implemented in accordance with ISO 17776.

The following conditions shall be documented when conducting a red-zone Hazid:

- hazards which could cause harm to people or equipment – including dropped objects related to equipment on the move
- areas which provide the greatest separation between fixed work positions and risk areas, where the following aspects should be given emphasis:

  - secure distance from moveable or pressurised equipment
  - protection against dropped/toppled objects from equipment in the derrick and on the drill floor
  - unimpeded escape routes
- entrance(s) to the red zone – if more than one, a main entrance should be defined
- prepare a draft diagram of the red zone*
- risk-reducing, corrective and/or compensatory measures.

* An inspection shall be conducted with the users to review the red-zone diagram before this is approved.

2.2.2.1 Activities and work operations

A Hazid shall focus on identifying areas where the operation of remotely operated pipe handling equipment or drilling machines could risk harming personnel and equipment. A red-zone Hazid shall cover all activities and work operations pursued on the drill floor. That also applies to the use of equipment on temporary hire, in terms of conflicts with other equipment, for example, and the need to disconnect the anti-collision system or other safety functions.

If new planned activities or work operations are identified, a Hazid shall be conducted which covers these.

In the event of substantial changes to the drill floor which affect work in the red zone, the red-zone Hazid shall be repeated. A new Hazid shall be implemented every third year and should take account of experience in using the red zone, including incidents. Norwegian Oil and Gas guideline 081 refers to a Hazid update for manual pipe handling operations every third year, and it could be appropriate to coordinate this with the red-zone Hazid.

2.2.2.2 Participants

Composition of the Hazid team is crucial for a successful Hazid.. It should comprise a leader, a facilitator, operational management, operational personnel working in the red zone, safety personnel, safety delegates and technical personnel. Operator representatives should participate for a mobile facility under contract.

The leader and facilitator should have expertise and experience in carrying out a Hazid in accordance with ISO 17776. This is important for ensuring a systematic review.

2.2.2.3 Planning a red-zone Hazid

Before a Hazid is initiated, descriptions should be produced of the work operations and activities which are pursued on the drill floor and covered by the Hazid.

Drawings and relevant procedures for pipe handling equipment shall be available.

2.2.2.4 Experience transfer and learning

Incidents which have occurred in the red zone should be utilised in the Hazid to ensure that lessons are learnt from them.

2.2.2.5 Hazid for remotely operated pipe handling

Norwegian Oil and Gas guideline 081 specifies that procedures for a remotely operated pipe handling system should be based on a Hazid. This shall be conducted in accordance with ISO 17776. While Hazids for remotely operated pipe handling and for the red zone have different purposes, it could be possible to combine or coordinate these, and the appropriateness of doing so should be assessed.

Operations using the catwalk machine/pipeshute on the drill floor shall be included in the red-zone Hazid, since a threat exists that pipes and equipment can fall out of the catwalk machine/pipeshute onto the drill floor. In addition comes a risk of crushing when the equipment is in motion.

2.2.2.6 Communication of red-zone Hazid

A red-zone Hazid shall be summarised and presented to users in order to give them the necessary decision base for taking care of health, safety and the working environment. Hazards and risk-reduction measures identified in the red-zone Hazid shall be made known to relevant personnel. That applies particularly to the driller, who is normally responsible for controlling personnel in the red zone.

A red-zone Hazid shall be used to develop rig-specific procedures for pipe handling.

Information from the red-zone Hazid is also relevant for planning and preparing work operations and for the toolbox talk meeting. It should therefore be summarised in a form which is appropriate for use in risk assessment processes.

2.2.3 Risk associated with pipe handling system

The red zone shall be established so that no personnel can be struck or crushed by moveable equipment when remotely operated pipe handling systems are working.

2.2.4 Risk associated with dropped objects

The red zone shall be established to reduce the possibility of personnel being struck by dropped/toppled objects or objects in motion.

2.2.5 Entrances to the red zone

The red zone should have as few entrances as practicable. If there are several, one shall be defined as the main entrance to ensure better control of personnel going in and out.
The main red-zone entrance shall be visible to the driller in the driller's cabin.

2.2.6 Marking

The red zone shall be marked by red paint or solid red plates securely fastened to the deck. These plates shall be at least 10 centimetres wide.

2.2.7 Physical barriers

Physical barriers, such as gates, chains or tape, shall be used to cordon off the red zone. Gates should be marked in red/white. The cordon is coloured red with a superimposed text for information. A red cordon around the red zone is used to underline the risk exposure inside the zone and the need to prevent breaches of the cordon. Entrance to the red zone shall be through gates.

It is important that barriers do not hinder evacuation from the red zone, and to this end they should be equipped with a weak link. Signs shall be set up at all entrances to the red zone.

2.2.8 Overview plan

A plan or diagram giving an overview of the red zone shall be placed at all entrances to the drill floor and in the driller's cabin. A safe route to the driller's cabin shall be marked on the plan, which shall also provide contact information for the driller.

2.2.9 Communication system

Equipment and routines for communication shall be established for access to and work in the red zone.

Details of communication when carrying out work and checking personnel are covered in section 2.4.6.

2.3 Planning

This chapter describes how the planning process for drilling and well operations should take account of work in the red zone. Figure 2.4 presents relevant elements in the planning process.

Figure 2.4 Elements in the planning process of relevance for handling work in the red zone.

2.3.1 Main principle

Activities and work operations shall be planned so that work in the red zone and exposure time is minimised. Priority shall be given to remote operation which can replace manual work in the red zone. Moving permanent and temporary manual work operations normally carried out in the red zone to outwith the zone should also be considered.

2.3.2 Planning activities

The planning process should ensure that activities and work operations which require personnel in the red zone are coordinated, so that the number of people involved and their exposure time are minimised. Technical measures shall be given priority over operational actions in order to reduce risk.

Equipment, such as downhole tools, shall be tailored to the remotely operated pipe handling equipment on the facility.

Some work operations may call for SDLAs. These shall be planned to minimise manual work in the red zone.

The planning process shall ensure that personnel, including service company employees, involved in activities and work operations on the drill floor participate in the planning of red-zone work and understand the requirements for working in the red zone. This applies to service-company personnel who are the responsibility of the operator, the drilling contractor or the rig owner.

The planning process shall identify all activities and work operations which could involve red-zone work, and verify that these are covered by the red-zone Hazid. Planned manual work in the red zone should be described in the DOP.

2.3.3 New activities

The planning process should ensure that new activities and work operations are identified, and that the need to review the existing red-zone Hazid or conduct a new red-zone Hazid is assessed.

2.3.4 Complex work operations

Complex work operations could require special assessments or other risk processes in the planning processes. Such assessments shall ensure that the procedures for the red zone are adequate for the planned work operation. The need for a specific Hazid covering the operation should be assessed. It is important that personnel involved are informed of special circumstances and/or risk-reducing measures which are implemented for the operation.

2.3.5 Hire of temporary equipment

Some activities require the hire of temporary equipment. When assessing such hiring temporary equipment, opportunities for remote operation shall be given a higher priority than manual equipment. The assessment should take account of conflicts with other equipment and the need to disconnect the anti-collision system or other safety functions.

2.3.6 Starting up after a drilling stop

A ready-for-operations programme needs to be run after a long drilling stop. Verification of operational and technical systems related to the red zone should be part of this programme. An assessment should be made of whether new systems, equipment, controls and/or activities might affect the red zone. The need for a new Hazid should be considered.

2.3.7 Process for rig acceptance

The Norwegian Oil and Gas handbook on applications for consent for well operations from a mobile facility provides information which is important for rig acceptance.

The operator should assess the establishment of a red zone and control of work in this area as part of the rig acceptance process. An important point is to verify that planned activities and work operations are covered by the red-zone Hazid.

2.4 Conduct of work and control of personnel

This chapter describes the procedure for controlling work and personnel in the red zone. Figure 2.5 presents elements in the process for executing work and controlling personnel. Appendix 2 presents an example of a procedure for controlling personnel in the red zone.

Figure 2.5 Elements in the process for conducting work and controlling personnel.

2.4.1 Main principle

Personnel shall not be in the red zone unnecessarily, exposure time should be as short as possible, and access shall be limited to the number of people required to execute the work.

Furthermore, moving permanent and temporary manual work operations out of the red zone should be assessed if this is considered appropriate in safety terms.

The red zone applies at all times.

2.4.2 Responsibility

Positions/roles shall be designated with responsibility for communication of and compliance with the procedures.

The driller is responsible for work execution and personnel control in the red zone.

Rigs with two derricks have two separate red zones, and each shall have its own responsible person. There should be routines for coordinating activities between the two red zones.

2.4.3 Requests to enter the red zone

The driller shall assess all requests to enter the drill-floor red zone. Access shall only be given for work which cannot be handled by remotely controlled equipment.

The following information should be assessed:

- conclusion from the red-zone Hazid referring to planned activities or work operations
- the DOP
- the relevant work procedure
- risk assessment of red-zone activities through toolbox talks or an SJA.

2.4.4 Toolbox talk with risk assessment

Work involving manual intervention in the red zone shall be preceded by a toolbox talk which includes a risk assessment.

Where unplanned manual operations such as equipment breakdown or failure of the anti-collision system are concerned, a risk assessment shall be conducted before the work begins. See Norwegian Oil and Gas guideline 090 on a common model for an SJA.

2.4.5 Work in the derrick

Work in the derrick can affect the risk for personnel in the red zone. It is therefore assumed that entry to the derrick is controlled by the driller.

Moving equipment can pose a risk of crushing in some zones of the derrick on the facility. This risk shall be controlled using work permits or rig-specific procedures.

2.4.6 Communication

Communication routines for access to the red zone and for work there shall be established and agreed in a toolbox talk.

Access to the red zone shall be conducted with a confirmatory communication method prior to entry.

A confirmatory communication method can be conducted by using agreed hand signals or radio communication. Agreed hand signals should be defined and described in the relevant procedure.

2.4.7 Access to drill floor and driller's cabin

A drill floor may have several entrances. One should be used for personnel working on the drill floor, including the red zone. This main entrance should enable personnel to access the driller's cabin safely. It shall be clearly marked.

It is important that the facility has a procedure for accessing the drill floor and the driller's cabin, and this shall be made known to all personnel involved.

2.4.8 Status of the pipe handling system

No access to the red zone shall be permitted before the status of the pipe handling equipment is known – in other words, whether systems are energised or otherwise moveable. This status should not be changed while people are in the red zone.

Where work on the actual pipe handling system is concerned, both the status of the pipe handling equipment and the need for isolation shall be clarified before work begins.

2.4.9 Methods for risk assessment

Before manual work in the red zone, the risk assessment method shall be determined – an SJA, for example, or a toolbox talk. It is important that all relevant personnel are familiar with the risk assessment. Risk-reduction measures identified in the red-zone Hazid should be taken into account.

2.4.10 Well work on the drill floor

Norwegian Oil and Gas has produced a handbook on safe handling of wireline equipment on deck, which also covers its use on the drill floor. This handbook uses

the term “exposed zone” for an area which could be exposed to dropped objects, equipment in motion in connection with wireline operations, and rigging of equipment which involves suspended loads.

Wireline operations expected to take place in the drill-floor red zone shall be covered in the red-zone Hazid and thereby included when assessing the extent of the red zone.

Appendix 1 presents a sketch which shows an example of the interface between the drill-floor red zone and the exposed zone.

2.4.11 Handovers

Most activities and many work operations are pursued over several shifts. Handovers between personnel are an important safety factor, particularly in connection with red-zone work. Handovers are also needed when taking breaks during a shift.

Manual work being conducted in the red zone should be specifically covered in the handover both for those responsible (driller and area authority) and for those doing the work.

Ongoing activities requiring a work permit and/or isolation – such as disconnecting the anti-collision system – shall be described in the handover.

3 CHANGE MANAGEMENT

Changes to equipment in the red zone, the type of operation under way in this area and other aspects which could affect how the red zone functions shall be managed. Such changes should be assessed, possible additional risk factors identified and new measures implemented if necessary. Assessing changes in the planning process is important for securing sufficient time to assess risk factors and possible measures.

Changes can be caused by special requirements or specialised equipment for drilling operations in a specific well. The operator should provide information on this in good time.

Updating the red-zone Hazid could be necessary with some changes.

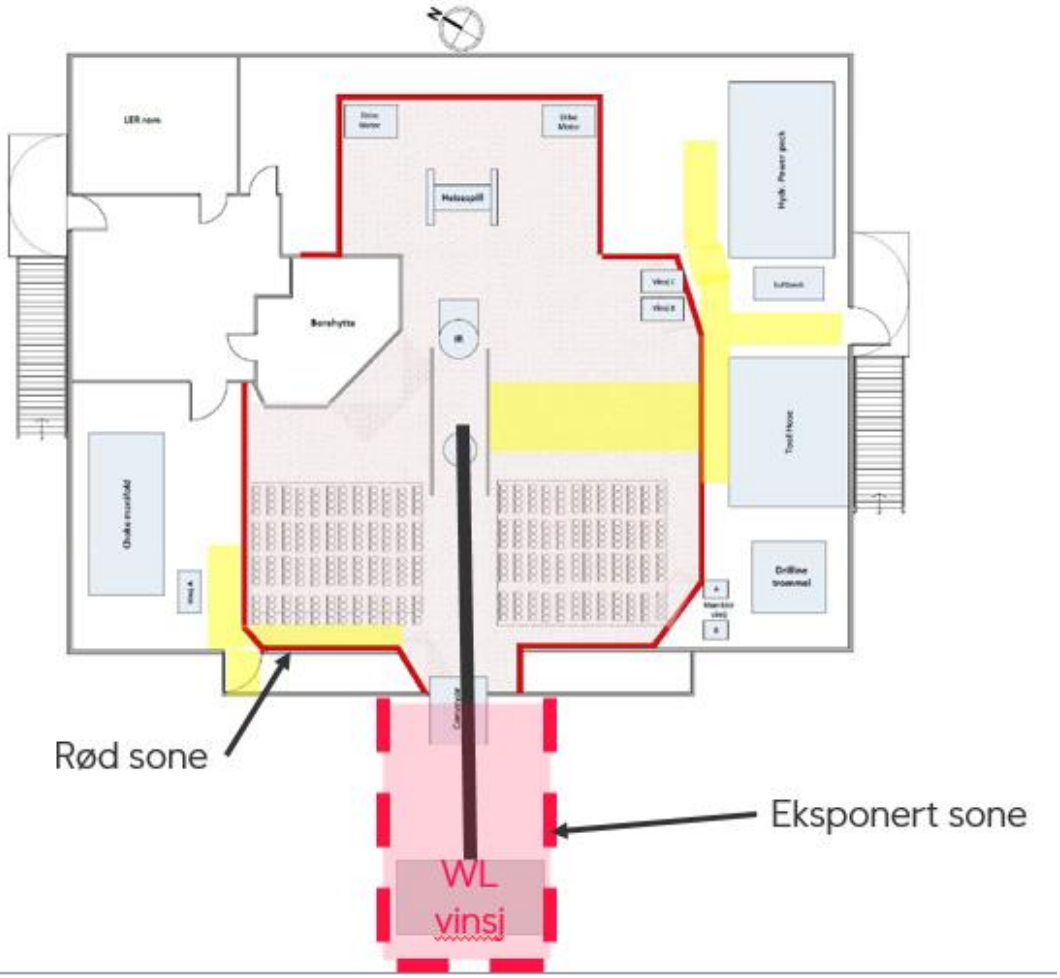
Changes can affect the extent of the red zone and require amendments to marking.

A system shall be in place to ensure that relevant personnel are made aware of changes.

4 CONTINUOUS IMPROVEMENT

Continuous improvement is a basic principle in the PSA's HSE regulations. This assumes that a system is in place to learn from one's own experience and that of others, and to implement improvements in established procedures and practice. The operator, rig owner and drilling contractor should concentrate attention on learning from experience with red-zone work in order to improve procedures and practice. Events in the red zone shall be reported, and relevant incidents should be investigated and measures implemented to avoid recurrence in accordance with the company's own requirements.

APPENDIX 1 INTERFACE BETWEEN RED AND EXPOSED ZONES



Key:
Rød sone – Red zone
Eksponert sone – Exposed zone
WL vinsj – Wireline winch

APPENDIX 2 EXAMPLE OF THE CONTENT IN A PROCEDURE FOR EXECUTING WORK AND CONTROLLING PERSONNEL

The purpose of this appendix is to present an example of a step-by-step procedure for controlling personnel on the red zone and access to the derrick.

1. Newcomers to the facility shall have a conversation with the driller which reviews the procedure for access to the drill floor/driller's cabin and red-zone entry.

2. A toolbox talk shall always be conducted before commencing manual operations:

    - the communication method is agreed during the toolbox talk
    - communication shall be conducted with the agreed method before entry.

3. If manual work is not covered in the red-zone Hazid, an SJA shall be conducted.

4. The driller should assess proposals to enter the red zone, based on:

    - summation in the red-zone Hazid with reference to planned activities or work operations
    - DOP
    - relevant operational procedures
    - risk assessment of the red-zone activity through a toolbox talk or SJA.

5. Entering the derrick is logged in a separate log. All personnel who enter the derrick shall be logged. The need for a work permit to enter special areas of the derrick shall be assessed.

6. Approval from the driller is required to enter the red zone, which shall be done through established barrier gates. Communication will be conducted with an agreed confirmatory method.

7. The status of the pipe handling system shall be clarified before work involving manual handling is conducted in the red zone. "Status" means the possibility of the equipment moving and whether systems are in operational mode and energised. The status shall not be changed while people are present in the red zone.

8. When work involving manual handling in the red zone has been completed, everyone shall leave the red zone. The driller shall be informed when all personnel are out of the red zone.