

Health, Safety and Environmental Case Guidelines for

MOBILE OFFSHORE DRILLING UNITS



**GLOBAL
LEADERSHIP
FOR THE DRILLING
INDUSTRY**

International Association of Drilling Contractors



**Health Safety and Environment
Case Guidelines
for
Mobile Offshore Drilling Units**

**Issue 3.3
1 December 2010**

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International Association of Drilling Contractors

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Document Review Status

Issue	Review Status	Date
01	First formal issue following receipt of NSOAF Acknowledgement	February 2003
02	Legislative Updates for Denmark, The Netherlands and Norway; Change of Norwegian Regulator from NPD to PSA; Enhancement of referencing between the ISM Code and this document; Additions to Section 3.3.3 (BOP Control System and API 16D)	30 June 2004
3.1	First Global Issue – Complete document update of all parts and appendices. Draft issued for consultation and comment	6 March 2006
3.2	Formal issue of Global version, incorporating comments and suggestions made by all stakeholders.	3 October 2006
3.2.1	Administrative update	1 May 2009
3.3	<p>Amended:</p> <ul style="list-style-type: none"> • Section 2.2.1.1, and 2.2.3.4 revised text regarding preparation of bridging documents to emphasize cooperative development with the client and other stakeholders. • Section 2.2.1.1, added Note regarding bridging arrangements and Management of Change. • Section 3.0, added “Deepwater Wells”. • Section 3.3, added “Details of arrangements for Deepwater Wells”. • Section 3.6, added “Confirmation that these routes have been assessed for the effects of fire and blast.” • Section 4.9.4, added “creation of bridging documents” as a potential source of information for feedback. • Section 5.1, added note emphasizing the need to address Emergency Response arrangements in bridging documents and the need 	1 December 2010

	<p>to assure continuity of Emergency Response arrangements when a MODU comes off contract.</p> <ul style="list-style-type: none">• Section 5.3.2, added note to address the need to address participation in drills and exercises by client and third-party personnel in bridging documents if not address in the management system.• Section 6.5, added note to address verification of HSE Critical items in bridging documents.• Various editorial corrections.	
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Foreword

It is reassuring to see an IADC regional initiative developed into a global one which specifically addresses the requirements of Drilling Contractors and their stakeholders.

The drive to improve cooperation and promote further harmonisation of legal requirements was initially provided by both industry and the coastal state regulators in North West Europe, namely the North Sea Offshore Authorities Forum (NSOAF). As a result of the excellent initial work undertaken by IADC members in this region, the benefits of the guidelines to offshore Health, Safety and Environment in the drilling industry have been acknowledged by both the North Sea Offshore Authorities Forum (NSOAF) and the International Regulators Forum (IRF). Additionally, regulatory agencies in other parts of the world have also acknowledged its benefits.

Interest in the IADC HSE Case guidelines outside North West Europe has influenced the development of a global guideline specifically addressing the needs of Drilling Contractors and external stakeholders.

This project was initiated following requests by IADC members operating in diverse worldwide locations to improve the cooperation amongst Drilling Contractors, oil and gas producers and coastal state regulators to further promote the harmonisation of requirements.

For me personally, the IADC HSE Case Guideline for Drilling Contractors has achieved two major successes. Firstly, the guideline gives priority to addressing the requirements of Drilling Contractors, which is a first within industry. This represents a milestone and a significant contribution to improving health, safety and environmental management.

Secondly, this project has brought together IADC members, oil and gas producers and regulators to share a mutual commitment to harmonise and simplify requirements. The success of this industry alliance has contributed to this being a truly global effort.

It is a privilege to be associated with so many professionals in this field, who have devoted so much time and effort in achieving this guideline.

Dr. Lee Hunt
President
International Association of Drilling Contractors

Introduction to the IADC HSE Case Guideline

Welcome

Welcome to the International Association of Drilling Contractors (IADC) Health Safety and Environmental (HSE) Case Guideline. This Guideline has been developed by IADC members to:

- Assist them in providing a demonstration to other stakeholders that their internal assurance process ensures that their management system's risk reducing controls related to the Health, Safety and Environment aspects of their operations, meets their senior management's expectations.
- Provide an HSE Case methodology specifically for Drilling Contractors that addresses the requirements and scope of operations related to their business activities, and that is aligned with, or meets, international standards.
- Assist International Regulators in reviewing Drilling Contractor's HSE Cases (when applicable) enabling Mobile Offshore Drilling Units (MODU's) / rigs to operate in different global regulatory jurisdictions.
- Assist them in providing a demonstration of compliance with the International Safety Management (ISM) Code requirements of the International Maritime Organization (IMO).
- Verify compliance with applicable regulatory and contractually agreed HSE requirements.
- Assist them in providing a demonstration to their external stakeholders, where applicable, that their management system's risk reducing measures meet agreed-upon stakeholder's expectations.

This guideline was developed for Drilling Contractors, and their scope of operations. Although the Guideline is not compulsory, its use is recommended as a demonstration of good industry practice for Drilling Contractors. While it is intended to provide a consistent methodology based on recognised practices and standards, Drilling Contractors should develop their HSE Case based on their organisation's methods of managing their scope of operations and business activities. By following the process outlined in this guideline, users may demonstrate a high degree of HSE management assurance. This assurance, although acceptable to demonstrate the robustness of an organisation's ability to manage HSE, it may not support all of the requirements for certification under ISO 9001, 14001 or OSHAS 18001.

IADC trusts that Drilling Contractors will find this Guideline useful and easy to follow. If errors or inconsistencies are identified, or there are suggestions for improvement, then please submit relevant information to IADC. (See details at end of this introduction – "Guideline Updates").

Background

The global offshore oil and gas exploration and production arena is a diverse landscape of differing operating and business environments, national regulations and numerous authorities regulating offshore activities. Many Drilling Contractors find it challenging to satisfy the differing internal and external stakeholder expectations related to HSE management each time their units are moved from one geographical location to another.

Drilling Contractors, Oil and Gas Producers and Authorities around the globe have seen the benefit of adopting and sharing a consistent harmonised approach in providing HSE Management assurance to meet various requirements.

The development of this approach and methodology has improved cooperation to demonstrate HSE management assurance applicable to worldwide operations. This

pragmatic approach and the development of a user-friendly methodology is intended to contribute to the improvement of people's understanding and application in the workplace.

Discussions with regulatory agencies indicated that "HSE Case" commitments made by the owner or operator of a MODU/rig whilst in one country may be communicated to other relevant Coastal State authorities, subject to any legal restrictions. Thus, with an effective HSE Case, compliance to earlier commitments can be more effectively monitored when a MODU/rig moves across national boundaries.

Guideline Application and Status

The Guideline is intended to assist Drilling Contractors in preparing and reviewing HSE Cases that should provide themselves and the relevant international authorities with the assurance that their operations will comply with requirements and be conducted within tolerable limits of safe operations.

The Guideline seeks to identify and address specific Coastal State regulatory requirements. While the Guidelines seek to offer advice on good practices and regulatory compliance, they are not an authoritative interpretation of each Coastal State's regulatory requirements. Where questions of regulatory requirements are identified, the Drilling Contractor must confirm their application with the relevant Regulator.

The Guideline has been developed to address the requirements of the:

- European Extractive Industries Directive (EID) 92/91/EEC as incorporated into Danish, Dutch and German legislation and detailed in Appendix 4.
- European Framework Directive (FD) 89/391/EEC as incorporated into Danish, Dutch and German legislation and detailed in Appendix 4.
- UK & Norwegian regulatory requirements which, while being very similar to the EID requirements, have been derived from separate backgrounds and are also detailed in Appendix 4.
- Australian regulatory requirements for Safety Cases, as detailed in Appendix 4.
- IMO's International Safety Management (ISM) Code, as detailed in Appendix 4.
- OHSAS 18001- International occupational health and safety management system, as detailed in Appendix 4.

With regard to the title of the document, many coastal state regimes use a different term. For consistency this guideline is referred to as the Health, Safety and Environmental (HSE) Case Guideline to reflect the:

- Trend towards integrating the management of health, safety and environment.
- Requirements of the ISM Code and those of many Coastal State Areas which address environment in the same way as health and safety.

When developing an HSE Case based on this guideline, care should be taken to ensure that it reflects the relevant regulatory requirements and the operating culture of the coastal state / region it is being developed for. Before developing an HSE Case for a specific coastal state / region, it is recommended that Drilling Contractors consult with the relevant regulatory agencies. This will ensure a common understanding of what is required and how it should be presented.

Development and Presentation

As per the Guideline, HSE Cases are not necessarily required to be presented in a standard format. However, the Guideline's structure lends itself to be adopted as a template, globally accepted among Drilling Contractors, Oil and Gas Producers, and regulators.

An HSE Case can be presented as a stand-alone document. However, with the development of technology, electronic means of presentation are available and acceptable within the Guideline.

Where electronic presentation of information is being considered, it is essential that details are discussed and agreed with the external stakeholders (i.e., clients and regulators) prior to presentation.

HSE Case Submission to External Stakeholders (Coastal State Authorities)

When submitting an HSE Case to an External Stakeholder, especially Coastal State Authorities, the document should always be accompanied by a covering letter containing a personal statement by the Drilling Contractors' senior management representative. The statement should clearly indicate the company's HSE values, the significance of the HSE Case as part of their overall management system process and their (individual or collective) commitment to its outcomes.

Guideline Structure and Contents

The Guideline has been developed in six parts.

Part 1 HSE Case Introduction

Part 2 Drilling Contractor's Management System – (HSE Management)

Part 3 MODU / Rig Description and Supporting Information

Part 4 Risk Management

Part 5 Emergency Response

Part 6 Performance Monitoring

Appendices:

1 – Reference Documents

2 – Abbreviations and Definitions

3 – Drawings & Schematics

4 – Coastal Area Regulatory and ISM Code Index Indexes

Assessment and Acceptance

Each Drilling Contractor, Coastal State, and other stakeholder may have its own requirements for assessing and accepting HSE Cases. The Regulatory Indexes in these Guidelines contain information on specific regulator acceptance arrangements, which should be confirmed with the coastal state authority at the outset.

Abbreviations and Definitions

Throughout this guideline various abbreviations have been used. An explanation of these can be found in Appendix 2. Likewise, to ensure consistency in approach and understanding, IADC has adopted definitions for a number of specific terms which have been drawn from ISO standards.

Guideline Updates

Having developed the Guideline, IADC wish to further develop and maintain it so that it remains a useful and respected source of information.

All users of the Guideline are asked to notify IADC of any errors or suggested improvements using the suggested format below.

The IADC contact details are as follows:

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Suggested Format for Advising of Errors/Improvements:

Submitted By:
Regulatory Authority Concerned (if applicable):
Details of HSE Case Guideline Error/Improvement
Date:

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1.1 INTRODUCTION TO THESE GUIDELINES

Drilling contractors have historically managed HSE and operational risks. During the 1990's, many Drilling Contractors recognized that in order to achieve a step-change improvement in safety and operational performance, they would have to formalize their long term experience and work practices within a structured framework represented by a management system. The development of an effective management system was to ensure appropriate risk management efforts would be consistently applied by people at the worksite to manage Major and Other Workplace Hazards to ensure safe and reliable operations.

In order to further improve the efficiency and effectiveness of business results, many Drilling Contractors have integrated the management of HSE risks into their remaining business activities.

An HSE Case has two primary purposes:

1. Demonstrate internal assurance within the Drilling Contractor's organisation that its management system's risk reducing controls related to the Health, Safety and Environment aspects of its operations, meets its senior management's expectations.
2. and, where applicable: demonstrate to the Drilling Contractor's external stakeholders that its management system's risk reducing controls meet stakeholder's expectations.

The HSE Case demonstrates how a Drilling Contractor's organisation applies a systematic risk management approach to maintain and improve HSE and operational performance. Developing and maintaining an HSE Case provides continuous assurance that existing HSE risks are effectively managed and provides assurance that risks associated with changes to equipment, activities or locations, as well as systemic weaknesses identified by incident analyses and audits will be effectively managed.

These Guidelines contain several Parts which, when applied in combination, may be used by the Drilling Contractor to develop an effective HSE Case for HSE Management Assurance (See Figure 1.1.1).

- **Part 2 - Drilling Contractor's Management System** describes the Drilling Contractor's management system and presents HSE management objectives that must be met to demonstrate assurance that HSE risks are reduced to a tolerable level. The methods of achieving the HSE management objectives must be considered in Part 4.
- **Part 3 – MODU/Rig Description and Supporting Information** describes the equipment and systems necessary to meet the HSE management objectives described in Part 2 and to fulfil the requirements of the Drilling Contractor's Scope of Operations. The equipment and systems must be considered in Part 4.
- **Part 4 – Risk Management** describes the Risk Management Process for assuring that the risks associated with a Drilling Contractor's Scope of Operations are reduced to a level that is tolerable to the Drilling Contractor and other stakeholders. The Risk Management Process must consider the HSE management objectives described in Part 2 and the systems and equipment described in Part 3. Any gaps related to the HSE Management Objectives in Parts 2 and 3 that are identified in Part 4 must be addressed in the Drilling Contractor's management system. In addition, the Risk Management Process described in Part 4 has been developed to comply with requirements of:
 - International Maritime Organisation (IMO) – International Safety Management Code (ISM) and,
 - those regulatory regimes outlined in Appendix 4.
- **Part 5 – Emergency Response** describes the HSE management objectives for emergency response of incidents - to mitigate the consequences (severity) identified in Part 4 and the measures to recover. The HSE management objectives included in Part 5 are considered in Part 4.

- **Part 6 – Performance Monitoring** describes arrangements for monitoring to ensure that the risk management measures identified in Part 4 are implemented, maintained and effective at the workplace. Regular monitoring at the workplace is also a risk reducing measure considered in Part 4.

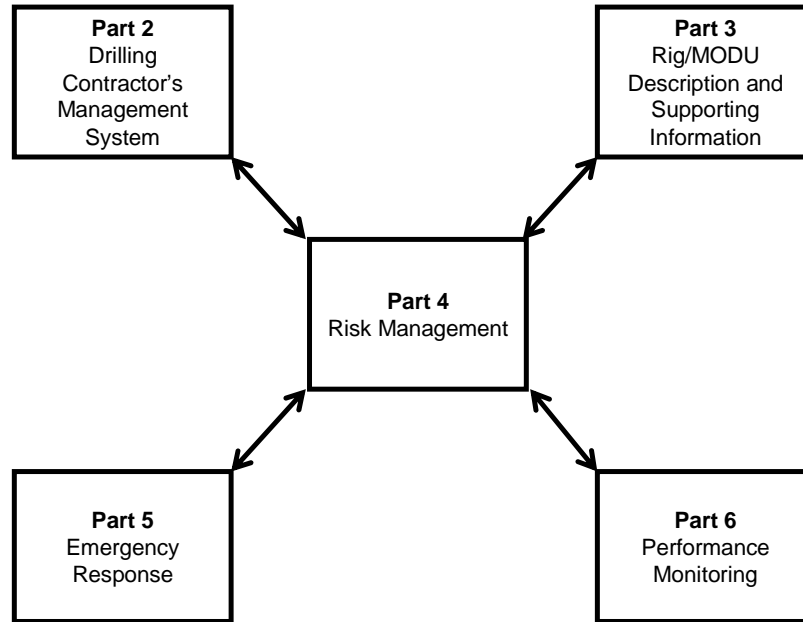


Figure 1.1.1 – HSE Management Assurance

To provide assurance that a Drilling Contractor is managing HSE effectively, Parts 2, 3, 5, and 6 must to be applied in conjunction with a structured risk assessment process as described in Part 4.

The benefits to a Drilling Contractor completing an HSE Case are:

- Identification of the sources of the HSE hazards included in the Drilling Contractor's Scope of Operations;
- Assurance that the risks associated with hazards and sources of hazards have been assessed and that the controls within the Drilling Contractor's management system (documented and experienced based work practices) are effective. (See Parts 2 and 3 of these Guidelines.)
- Identification of possible gaps in the Drilling Contractor's management system relating to Major Hazards, Other Workplace Hazards, Occupational Health and Environmental Aspects.
- Verification to ensure that identified risks are reduced to a level that does not exceed the Drilling Contractor's tolerability limits for safe operations.
- Demonstration of compliance with applicable regulatory and contractually agreed HSE requirements.

For Drilling Contractors, who elect not to address the "environmental" aspects of these Guidelines in their HSE Cases, the term Health & Safety should be used in place of HSE. Refer to Part 4 – Risk Management - for a more complete discussion about integrating HSE Management into Drilling Contractor's scope of operations.

1.2 EXTERNAL STAKEHOLDERS HSE CASE EXPECTATIONS

While these Guidelines firstly address internal assurance for the Drilling Contractor, they also include assurances that may be expected by external stakeholders. These external stakeholder HSE Case expectations include arrangements which may be required to provide assurance that the HSE risks associated with the Drilling Contractor's scope of operations are reduced to a certain level of tolerability.

1.2.1 Senior Management Demonstration

External Stakeholder Expectations

- For the Drilling Contractor's senior management to demonstrate there is:
 - established HSE management within their business activities.
 - established measures against all identified HSE risks.
 - assurance that the MODU/rig is in compliance with all mandatory rules and regulations.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- A completed HSE Case that provides assurance within the Drilling Contractor's organisation that its management system's risk reducing controls related to the Health, Safety and Environment aspects of its operations, meet its senior management's expectations.
- A completed HSE Case that assures external stakeholders that the Drilling Contractor's management system's risk reducing controls meet agreed expectations.

1.2.2 HSE Case Scope and Arrangements

External Stakeholder Expectations

The scope and arrangements for providing assurance internally and a demonstration externally that:

- there is effective HSE management in place for managing major hazards, other workplace hazards and environmental aspects
- all potential hazards have been identified
- risks associated with these hazards have been identified, assessed and managed with any residual risks reduced to tolerable levels

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Description of the arrangements (such as described in these Guidelines) for providing assurance and verification that the expectations as outlined above are met.

1.2.3 Drilling Contractor Overview

External Stakeholder Expectations

An overview of the Drilling Contractor's organisation and values.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Brief summary of the Drilling Contractor's organisation including:
 - name and address of head, regional and or field offices
 - history and relationships with parent company (if applicable)
 - scope of operations provided
- Drilling Contractor's HSE values and vision.

1.2.4 HSE Case Responsibilities

External Stakeholder Expectations

Description of the Drilling Contractor's organisational, individual and team roles and responsibilities for the development and review of the HSE Case.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Identification of position(s) in the organisation with overall ownership and responsibility for the HSE Case.
- Identification of position(s) with responsibility for ensuring that the HSE Case is implemented and complied with.
- Identification of position(s) with responsibility for updating and periodically reviewing the HSE Case.
- Brief description of these responsibilities.
- Positions and experience of individuals who participated in the development of the HSE Case.

1.2.5 HSE Case Reviews and Updates

External Stakeholder Expectations

The Drilling Contractor has criteria and arrangements for reviewing and updating the HSE Case information for:

- changes in the operation or equipment which significantly change the overall risk (including changes related to geographical and environmental conditions)
- significant changes to manning levels or the organisational structure
- significant changes to the Drilling Contractor's Management System (or industry standards) referred to in the case
- developments in risk assessment methodology or lessons learned from incidents that may alter the results of existing risk assessments or risk management barriers
- changes in legislation / regulatory requirements
- expiry of any thorough review or resubmission interval specified by legislation / regulation
- expiry of any Drilling Contractor specified review interval.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Statement of the Drilling Contractor's commitment to review and update the HSE Case.
- Description of the criteria which would initiate a review of the HSE Case information.
- Description of the arrangements (including responsibilities) for reviewing and updating the HSE Case information.

1.2.6 Continuous Improvement

External Stakeholder Expectations

Demonstration that the Drilling Contractor is committed to continually improving the management of risks and environmental impacts associated with MODU or rig operations.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Statement of the Drilling Contractor's commitment to continuous improvement, by:
 - applying and contributing to the identification and development of industry standards and best practices.
 - participating in the development of legislation and regulations.
 - reviewing and assessing new technology.
 - reviewing and assessing the application of new legislations and regulations and implementing necessary changes within their management system.

1.2.7 Action Plan / Recommendations

External Stakeholder Expectations

Demonstration that the Drilling Contractor addresses recommendations and gaps in HSE performance; such as those identified as part of the Risk Assessment process within the HSE Case, and follows-up and closes-out agreed corrective actions.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Arrangements for the review of recommendations identified during the Risk Assessment process (Part 4), including:
 - References to the studies or sources from which each recommendation originated.
- Arrangements for follow-up and close-out of agreed corrective actions, including:
 - Persons/positions responsible for implementing each recommendation.
 - Target dates for completion of each recommendation.
- Arrangements for verifying the close-out of all recommendations.

1.2.8 HSE Case Presentation

External Stakeholder Expectations

A means of providing the HSE Case information to internal and external stakeholders.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Where the HSE Case document is presented in (paper) document format, a very brief description of the structure and content.
- Where the HSE Case document is presented in electronic format, a very brief description of the structure, content, and access arrangements.

1.2.9 Regulatory Requirements

External Stakeholder Expectations

Arrangements for compliance with the applicable regulatory requirements. (See Appendix 4 for the "Regulatory Indexes" applicable to these Guidelines.)

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Description of arrangements to establish and maintain compliance with applicable regulatory requirements.

1.2.10 HSE Management

External Stakeholder Expectations

Confirmation that effective HSE management has been implemented and is maintained.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Arrangements for monitoring and confirming that effective HSE management has been implemented and is maintained.

1.2.11 Environmental Impact and Aspect Assessments

External Stakeholder Expectations

To provide confirmation that the Drilling Contractor has systematically:

- identified and assessed all environmental impacts and aspects associated with the MODU or rig operations within the Scope of Operations.
- reduced the associated risks to meet legislative/regulatory environmental requirements.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Confirmation that systematic environmental impact and aspect identification and assessment has been carried out.
- Confirmation that the associated risks have been reduced to meet legislative/regulatory environmental requirements.

1.2.12 Justification for Continued Operation

External Stakeholder Expectations

Demonstration that the Drilling Contractor has assured that:

- all justifiable measures have been taken, or are in the process of being taken, to ensure that the HSE risks have been reduced to a tolerable level
- the HSE Management objectives included in the HSE Case have been achieved.

What in the Drilling Contractor's Management System demonstrates assurance to external stakeholders that these expectations are achieved?

- Commitment to operate the rig or MODU in accordance with the arrangements detailed in the HSE Case.
- A statement that there is an effective management system in place for systematically managing all HSE hazards (including environmental aspects);
- A statement that a rigorous process has been applied to identify potential hazards;
- A statement that the risks associated with these hazards (both major and other workplace hazards) have been identified, assessed and are being managed to a tolerable level;
- A statement that all the relevant regulatory HSE requirements are being complied with;
- A commitment to complete all agreed corrective actions identified in the Risk Assessment (Part 4);
- A statement of justification for continued operation that is supported by screening criteria applied in Part 4 and related to:
 - relevant regulations,
 - industry norms and good practices; and
 - company objectives.
- A statement of the senior management commitment to operate the MODU or rig in accordance with the conclusions from the HSE Case including those represented in the Summary of Operation Boundaries (SOOB).

2 DRILLING CONTRACTOR'S MANAGEMENT SYSTEM – HSE MANAGEMENT

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2.0 INTRODUCTION

Part 2 - describes the Drilling Contractor's management system and presents HSE management objectives that must be met to demonstrate assurance that HSE risks are reduced to a tolerable level. The arrangements for achieving the HSE management objectives must be considered in Part 4.

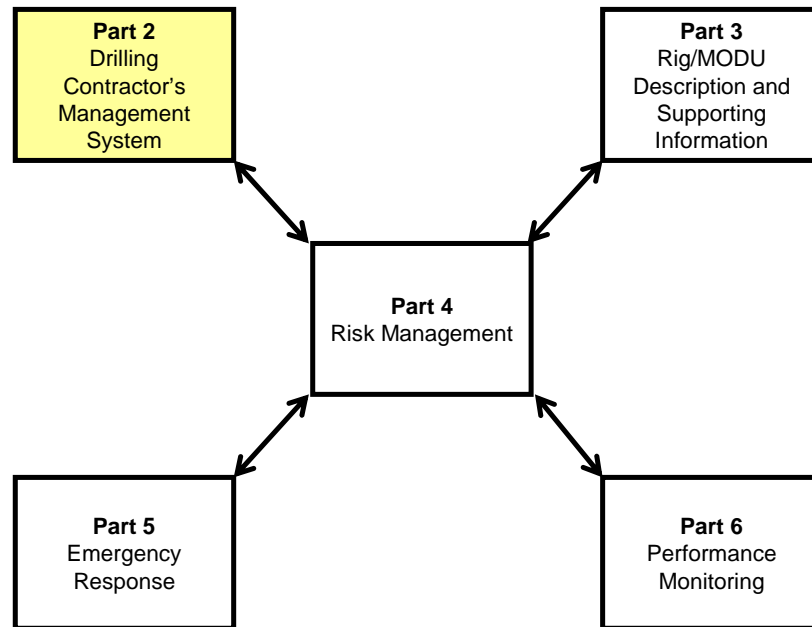


Figure 2.0.1 – HSE Management Assurance

To provide assurance that the Drilling Contractor is managing HSE effectively, Parts 2, 3, 5, and 6 must be applied in conjunction with a structured risk management process as described in Part 4. (See Figure 2.0.1)

A management system can be defined as a structured set of elements (interdependent processes and principles) that are intended to ensure that the operations of an organisation are directed, planned, conducted and controlled in such a way as to provide assurance that the objectives of the organisation are met. The Drilling Contractor's Management System represents the company's core business functions. Core business functions set expectations, within the management system element structure, by establishing policy statements inclusive of procedures, processes, approved work practices, and risk reducing measures. When such measures are effectively applied by the workers in the workplace it enables them to limit risks to a tolerable level.

Management System Model

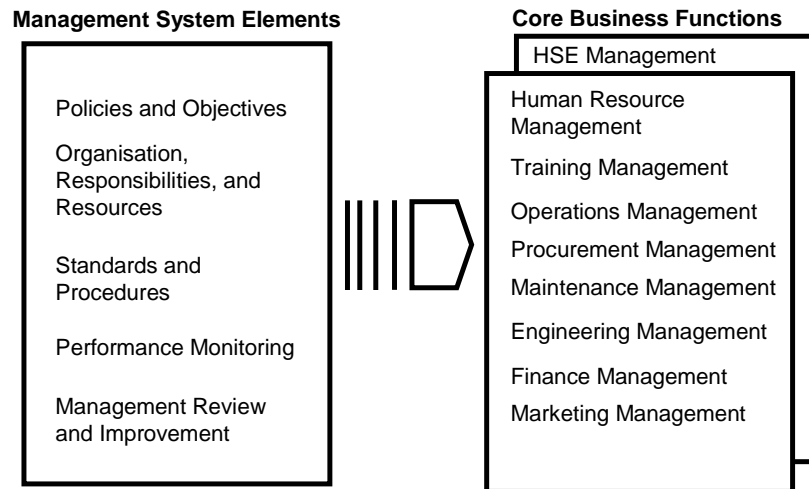


Figure 2.0.2 – Management System Model

HSE Management is a Core Business Function of a Drilling Contractor’s management system; however HSE Management is also integrated into each of the other Core Business Functions. (See Figure 2.0.2)

The HSE Case demonstrates that risks associated with major and other workplace hazards have been adequately assessed and that risk reducing controls within the Drilling Contractor’s Management System are applied.

For Drilling Contractors, who elect not to address the “environmental” requirements, the term Health and Safety should be used in place of HSE. Refer to Part 4 – Risk Management - for a more complete discussion about integrating HSE Management into Drilling Contractor’s scope of operations.

The HSE Case provides internal assurance that risks related to the Drilling Contractor’s business activities are being managed safely and reliably. It also provides a mechanism for the company to satisfy external stakeholders that identified risks within its Scope of Operations are effectively managed.

The Management System represents the Drilling Contractor’s senior management’s expectations for the people who manage and perform the business activities that produce the results. A Drilling Contractor cannot develop an HSE Case without having an effective Management System with Core Business Functions that include HSE Management.

It is important to ensure that the contribution made by all stakeholders’ third party contractors to align with Senior Management aspirations for safe operations on the MODU / rig is adequately addressed. Prior to commencement of operational activities, especially those that involve other parties, it is important that individual and collective responsibilities to ensure safe operations are clearly defined and documented. Clarity of communication of these responsibilities, to all relevant personnel, is essential to ensure that individual responsibilities are known, understood and accepted before start-up of such operations.

2.0.1 MANAGEMENT SYSTEM ELEMENTS

Effective application of the Management System Elements allows the Drilling Contractor to apply HSE management across all the Core Business Functions, no matter how these functions are arranged or grouped. A Drilling Contractor may use different terms to describe the management system elements, but all management systems share these elements in some form. The following management system elements are aligned with OHSAS 18001.

Policies and Objectives:

The policy(s) sets clear direction for the organisation to follow and the objectives provide targets against which (HSE) performance can be measured.

Organisation, Responsibilities and Resources:

The Organisation defines the structure, roles and responsibilities for setting and applying policy and for implementing the necessary work practices to achieve the objectives.

Standards and Procedures:

These arrangements, processes, procedures, specifications, work practices, etc. define how the Drilling Contractor intends to conduct its business activities while providing and maintaining a working environment where health, safety and environmental risks are adequately managed.

Performance Monitoring:

The Drilling Contractor defines the arrangements for monitoring by supervisors and other line management to ensure that plans and operations are being implemented as intended and for measuring performance (periodic monitoring; incident reporting and analysis, behaviour-based observation, etc.).

Assessing the overall effectiveness of the HSE Management through audit, (within the Drilling Contractor's Management System) and reviewing performance against the objectives.

Verifying the effectiveness of HSE critical Activities/Tasks and Equipment/Systems.

Management Review and Improvement:

Review and improvement of HSE strategy, resources, processes and systems by Management to ensure the ability to achieve HSE results is available.

2.0.2 ENVIRONMENTAL, HEALTH AND SAFETY STANDARDS (ISO 14001 and OHSAS 18001)

ISO 14001 is the standard developed by the International Organisation for Standardization (ISO) for environmental management systems. OHSAS 18001 is an occupational safety and health management system standard. OHSAS 18001 is structured similar to ISO 14001. It was specifically developed to be compatible with ISO 14001 and ISO 9001. This compatibility allows Drilling Contractors to develop one integrated environmental and occupational safety and health management system. Drilling Contractors who combine the management of Health, Safety and Environment may find it advantageous to base their management systems on OHSAS 18001 to avoid separate (and possibly redundant) occupational health, safety and environmental management programmes.

2.0.3 CORE BUSINESS FUNCTIONS

Each Drilling Contractor will arrange and group their core business functions differently. The arrangement will depend on the individual Drilling Contractor's business activities and scope of operations. The following core business functions are typically associated with a Drilling Contractor's organisation, no matter how they are arranged or grouped.

- Human Resource
- Training
- Operations

- Procurement
- Maintenance
- Engineering
- Finance
- Marketing
- Health, Safety, and Environment (HSE)

2.0.4 DEMONSTRATING ASSURANCE OF HSE MANAGEMENT OBJECTIVES

The HSE Case needs to demonstrate that HSE management objectives are met.

Parts 2, 3 and 5 of these Guidelines present HSE Management objectives that have been determined through experience by IADC members as those necessary to demonstrate assurance that risks in the Drilling Contractor's Scope of Operation are at a level tolerable to the Drilling Contractor. These HSE management objectives must be taken into consideration and evaluated during the Risk Assessment in Part 4 of these guidelines.

By evaluating these HSE management objectives in Part 4, the Drilling Contractor either:

- Demonstrates assurance that HSE management objectives are being met, or
- Identifies where arrangements to meet HSE management objectives are ineffective or not in place, and what compensatory measures are necessary to meet all the HSE management objectives.

A Drilling Contractor may identify additional controls to meet HSE management objectives during the Risk Assessment described in Part 4 of these Guidelines. The Drilling Contractor should ensure that the identified controls are incorporated in their management system.

These HSE Management Objectives have been organised within the ISO Management System Elements Structure, (See also Figure 2.0.1), so the defined objectives can be applied across the Drilling Contractor's Core Business Functions. Additionally, Part 2 contains HSE management objectives relating to procedural (human factors) controls and Part 3 contains descriptions of the equipment and systems (hardware factors) to meet the HSE management objectives.

2.0.5 HSE MANAGEMENT OBJECTIVES

POLICIES AND OBJECTIVES	
Policies Objectives	
ORGANISATION, RESPONSIBILITIES, AND RESOURCES	
Organisation	Resources
Organisation	HSE Resources
Document Management	HSE Committee Representation
Workforce Participation	Shore-based and Office Support
MODU or Rig Organisation	Clients Client's Third Parties
Responsibilities	Catering and Accommodation
Senior Management Responsibility	Medical Support
Line Management Responsibility	Competence
Individual Responsibility	Selection of Drilling Contractor's Personnel
Regulatory Requirements	Selection of Contractor Personnel
	Competence Assessment and records
	Training
	Induction Programme

STANDARDS AND PROCEDURES	
Planning and Risk Management Management of Change Emergency Preparedness and Response Permit to Work System Safe Working Practices Environmental Management Environmental Protection Management of Waste HSE Procedures HSE Meetings HSE Alerts and Bulletins Drilling and Well Control Operations Simultaneous and Combined Operations Bridging Documents Simultaneous and Combined Operations Risk Assessments	Marine Operations Adverse Weather Support Vessels Site Assessment Engineering Management Lifting Operations and Material Handling Logistics Management Personnel Tracking Helicopter Operations Hazardous and Radioactive Substances Procurement Management Maintenance Management Contractor Management
PERFORMANCE MONITORING	
Periodic Monitoring Incident Reporting and Analysis Behaviour-Based Observation Systems Environmental Monitoring and Measurement Audit and Audit Compliance Verification of HSE Critical Activities/Tasks and Equipment/Systems Certification	
MANAGEMENT REVIEW AND IMPROVEMENT	
Review	

2.1 POLICIES AND OBJECTIVES

2.1.1 Policies

Objective

To demonstrate that senior management have established clear expectations for HSE management.

How can this be achieved?

- By having policy(s) which clearly state the company's expectations.
- Clear commitment to comply with the: Drilling Contractor's policies, procedures, and standards; relevant HSE legislative/regulatory requirements and standards; and agreed client requirements.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the company health, safety and environmental policy(s).
- Details of any local or regional policy(s) and their relationship with the corporate policy.

2.1.2 Objectives

Objective

To demonstrate that the organisation maintains HSE management objectives against which it can assess its performance.

How can this be achieved?

- Developing strategic HSE management objectives and cascading them through the organisation.
- Maintaining annual HSE programmes and plans that show how HSE management objectives are to be achieved.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Information on how HSE management objectives are established and updated.
- The arrangements for cascading the HSE management objectives through the organisation.

2.2 ORGANISATION, RESPONSIBILITIES, AND RESOURCES

2.2.1 Organisation

2.2.1.1 Organisation

Objective

To demonstrate that there is an organisational structure with the appropriate core business functions to comply with the policy(s) and achieve HSE management objectives. This also includes how individual and collective responsibilities between all stakeholders are defined.

How can this be achieved?

- Having a clearly defined organisational structure.
- Defining and assigning HSE responsibilities to positions within the organisation.
- By cooperating with the client and other stakeholders in creating a bridging document describing individual and collective stakeholder responsibilities during the various operational phases.
- Providing adequate resources for consistent and effective HSE Management.
- Regular management review of the allocation of resources.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Organisation charts showing the management and support team structure to enable compliance with the policy(s) and achievement of the HSE management objectives.
- Details of HSE management responsibilities assigned to organisational positions.
- The process for developing and preparing a joint bridging document with the involvement of all participants before starting operations, clearly indicating Senior Management expectations regarding adherence to agreed responsibilities.
- Arrangements for regular management review of the organisational structure and allocation of resources.

Note: The normal nature of drilling rig operations calls for the direct and indirect involvement of a number of parties, who may operate under a variety of contractual arrangements with the client or the drilling contractor. The activities to be carried out by these other parties can introduce new hazards, or may affect the barriers (both controls and defences) used to reduce the risks associated with previously identified hazards. Any hazards identified as part of the bridging document development should be captured in the bridging document. Any significant additions should be considered for inclusion in the HSE Case when it is next revised. Where new hazards are identified during operations, or barriers are affected during operations, the Management of Change provisions of these Guidelines should be followed.

2.2.1.2 Document Management

Objective

To demonstrate that relevant, accurate and up to date HSE documentation is readily accessible.

How can this be achieved?

- Maintaining an effective document management system.
- Having clearly defined criteria for developing and revising documents.
- Establishing ownership responsibilities and authorities for reviewing and issuing documents.
- Establishing arrangements for issuing, accessing and withdrawing documents.
- Provision of arrangements to retain obsolete documents for legal and/or knowledge preservation purposes.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of the document management system.
- Arrangements and responsibilities for ensuring that HSE documentation is revised and updated to reflect changes in the Drilling Contractor's organisation, systems, equipment, etc.
- Arrangements and responsibilities for withdrawal and retention of obsolete documents.
- Method for ensuring that all personnel are informed in a timely fashion of revised procedures applicable to their assignment.

2.2.1.3 Workforce Participation

Objective

To demonstrate the workforce actively participates in HSE management activities, including the development, revision and review of the HSE Case.

How can this be achieved?

- Programmes that recognize and encourage the contribution of the workforce in HSE management activities.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Statement promoting active workforce participation in HSE management and HSE Case activities and recognising their contribution.
- Arrangements for programmes that recognize the workforce's participation and contribution to meet HSE management objectives.

2.2.1.4 MODU or RIG Organisation

Objective

To demonstrate that there is a defined structure for managing HSE on the MODU or Rig for which roles and responsibilities are defined.

How can this be achieved?

- Developing a structure in which the Master (if applicable) or senior Marine Supervisor and the OIM work effectively together with respect to HSE risks. The Drilling Contractor determines who has overall control and responsibility for the vessel and the safety of the people onboard and who has overall control and responsibility for the management of

the HSE risks associated with the drilling and associated activities. This relationship and the relevant responsibilities need to be defined, understood and agreed.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- An organisation chart showing the OIM and his management/supervisory team.
- Roles and responsibilities for the members of the management/supervisory team.

2.2.2 Responsibilities

2.2.2.1 Senior Management Responsibility

Objective

To demonstrate senior management has established integrated HSE management responsibilities for the organisation's core business activities.

How can this be achieved?

- Senior management prioritizing HSE at the same level of importance as other business activities.
- Appointing a senior management representative who, irrespective of other responsibilities, has defined roles, responsibility and authority for development and implementation of HSE Management and regular reporting on HSE performance to the highest level(s) of management.
- Senior management providing the leadership, resources and commitment necessary to develop, operate and maintain effective HSE Management in all business activities.
- Identifying the senior management positions with HSE critical activity responsibilities.
- Senior management's visible and active participation in HSE initiatives, ensuring HSE commitment is embedded into the company culture.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- A summary of senior management's responsibilities in HSE management activities.
- Assurance that sufficient resources will be provided to meet the defined HSE management responsibilities.

2.2.2.2 Line Management Responsibility

Objective

To demonstrate that HSE is an integral part of the line management's responsibilities.

How can it be achieved?

- By defining line management's responsibilities and authorities for HSE management.
- Identifying the line management positions with HSE critical activity responsibilities.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of line management's HSE responsibilities and authorities.

2.2.2.3 Individual Responsibility and Authority

Objective

To demonstrate that each individual knows and understands his or her responsibility and authority for HSE management.

How can it be achieved?

- Ensuring HSE responsibilities and authorities are established for individuals.

- Identifying individual positions with HSE critical activity responsibilities.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- The arrangements for ensuring HSE responsibilities and authorities are established for employees, contractors, and 3rd parties at the Drilling Contractor's locations and MODUs/rigs.

2.2.2.4 Regulatory Requirements

Objective

To demonstrate that relevant regulatory requirements are complied with.

How can this be achieved?

- Identifying relevant regulatory requirements.
- Ensuring arrangements are in place to comply with the requirements.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements and responsibilities for identifying and advising on relevant regulatory requirements.
- Arrangements for ensuring that the requirements are being complied with.

2.2.3 Resources

2.2.3.1 HSE Resources

Objective

To demonstrate there are adequate resources available to the organisation for HSE management.

How can this be achieved?

- Assigning knowledgeable and experienced individuals to carry out HSE management activities.
- Providing appropriate documentation, training and development for employees in company HSE standards and practices.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- The arrangements and responsibilities for providing adequate resources for HSE management activities.

2.2.3.2 HSE Committee Representation

Objective

To demonstrate that suitable HSE committee arrangements and HSE representation have been established and effectively implemented.

How can this be achieved?

- Promoting and supporting the establishment of formal HSE representative and HSE committee arrangements.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for establishment of HSE Committees.
- Arrangements for selection of HSE Representatives.
- Responsibilities and training for HSE Representatives.

- Frequency of HSE Committee Meetings and arrangements for taking minutes and tracking action items for follow up and close out.

2.2.3.3 Support

Objective

To demonstrate that there is a support organisation to provide adequate resources to meet the Senior Management HSE objectives.

How can this be achieved?

- Defining the key support functions required for safe and efficient operations and environmental protection.
- Ensuring these support functions are staffed by competent people with access to the necessary resources.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of the support organisation and the arrangements to provide the necessary resources to meet the HSE management objectives.

2.2.3.4 Clients

Objective

To demonstrate that safe and effective working relationships are established with clients with regard to HSE Management.

How can this be achieved?

- Cooperating with the client and other stakeholders in the development of bridging documents to identify and agree HSE management interfaces, responsibilities and authorities.
- Communicating the agreed arrangements to the relevant personnel so they know their responsibilities on the interface arrangements.
- Monitoring and regularly reviewing, with the client, the effectiveness of the interface arrangements.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for identifying and agreeing on HSE interfaces with the client.
- Arrangements for communicating identified and agreed HSE interfaces with relevant personnel at the appropriate levels.
- Arrangements for ensuring that HSE interfaces are regularly monitored and reviewed with the client.

2.2.3.5 Client's Third Parties

Objective

To demonstrate that safe and effective working relationships are established with Client's Third Parties with regard to HSE Management.

How can this be achieved?

- Identify and agree HSE management interfaces, responsibilities and authorities.
- Communicating the agreed arrangements to the relevant personnel so they know their responsibilities and authorities on the interface arrangements.
- Monitoring and regularly reviewing, with client's third parties, the effectiveness of the interface arrangements.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for identifying and agreeing on HSE interfaces with client's third parties.
- Arrangements for communicating identified and agreed upon HSE interfaces with relevant personnel at the appropriate levels.
- Arrangements for ensuring that HSE interfaces are regularly monitored and reviewed with client's third parties.

2.2.3.6 Catering and Accommodation

Objective

To demonstrate the provision of suitable arrangements for the health and welfare of all personnel while onboard the MODU or Rig are in place.

How can this be achieved?

- Providing clean and comfortable accommodation and rest facilities.
- Controlling noise levels, air quality and other environmental factors.
- Storing and preparing food in high standard hygienic conditions.
- Providing an appropriate quantity of drinking water that is safe for human consumption.
- By appropriate disposal of food waste and other accommodation waste.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for ensuring accommodation and rest facilities are maintained to appropriate standards.
- Arrangements for ensuring high standards of hygiene for storage, handling and preparation of food and drink.
- Arrangements for disposal of food waste and other accommodation waste.

2.2.3.7 Medical Support

Objective

To demonstrate that suitable medical support arrangements are in place.

How can this be achieved?

- Establishing arrangements for provision of medical support to meet operational needs and emergency situations.
- Providing suitably qualified Rig Medic / First-Aiders with appropriate facilities, equipment and drugs with onshore medical back up.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the medical support arrangements.
- Information on the MODU's or rig's medical and first aid arrangements.
- Protocols for all reasonable medical conditions affecting male and female employees (including pregnancy).

2.2.4 Competence

2.2.4.1 Selection of Drilling Contractor's Personnel

Objective

To demonstrate that there is an employee selection and assignment process that ensures personnel have the appropriate qualifications, experience and ability to perform their job safely and effectively with regard to HSE management.

How can this be achieved?

- Defining the competencies required for each of the positions with critical activity responsibilities.
- Defining the competencies required for each of the positions with hazardous activity responsibilities.
- Defining the competencies required for each of the positions with environmental oversight responsibilities.
- Assessing the individual competency as part of the selection and assignment process.
- Ensuring that personnel are medically fit for the position they are being assigned.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of positions that have HSE critical activity responsibilities e.g., OIM, Toolpusher, etc.
- Details of positions that have hazardous activity responsibilities.
- Details of positions that have environmental oversight responsibilities.
- Information on the selection process for assigning people to positions with HSE critical/hazardous activity responsibilities, including short service employees.

2.2.4.2 Selection of Contractor Personnel

Objective

To demonstrate that the Drilling Contractor uses contractors with similar HSE values and standards.

How can this be achieved?

- By applying the same selection process to the selection of contractor staff assigned to positions with HSE critical/hazardous activity responsibilities. (See 2.2.4.1 above.)

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Statement that the same selection process is applied to the selection of contractor staff assigned to positions with HSE critical/hazardous activity responsibilities.

2.2.4.3 Competence Assessment and Records

Objective

To demonstrate that personnel have the necessary knowledge, skills, and abilities to meet their responsibilities and perform their job safely and effectively.

How can this be achieved?

- Establishing arrangements for identifying both the general and specific (e.g. well control, fire team leader, etc.) competencies required to meet the responsibilities for each job function.
- Assessing individual competencies against the defined responsibilities for the job.
- Identifying those individuals assessed as being "not competent" and who require additional training or experience.
- Establishing a performance appraisal system.
- Maintaining records of each assessment and appraisal.

- Establishing methods to evaluate trends in HSE Culture identified through incident analyses or proactive behaviour-based observation systems.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of the competence assessment arrangements.
- Description of the performance appraisal system.
- Reference to the list documenting all identified HSE critical/hazardous activities, the individuals who are assigned responsibilities for each HSE critical/hazardous activity, the required competence criteria, and verification that this competence has been attained and is current.
- Description of methods to evaluate HSE trends identified through incident analyses or proactive behaviour-based observation systems.

2.2.4.4 Training

Objective

To demonstrate that personnel are adequately trained to meet HSE management objectives.

How can this be achieved?

- Defining HSE training requirements for each job function.
- Including individual HSE training that meets industry and regulatory standards in competency requirements.
- Establishing arrangements for completing HSE training for critical activity responsibilities, including familiarization of emergency procedures (e.g., fire, evacuation, etc.), in a timely manner after joining the MODU/rig.
- Establishing arrangements for completing HSE training for hazardous activity responsibilities.
- Maintaining records of HSE training completed.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of how individual HSE training needs that meet industry and regulatory standards are identified.
- Arrangements for ensuring that relevant HSE training is provided and recorded.

2.2.4.5 Induction Programme

Objective

To demonstrate that there is a structured induction programme to ensure all new personnel are informed of the Drilling Contractor's HSE policy, commitment and arrangements, and that appropriate refresher training is conducted for all personnel.

How can this be achieved?

- Identifying the key HSE information to include in the induction programme.
- Providing induction programmes for new personnel and for existing employees that change locations or job functions.
- Developing induction programmes to communicate the information in a language that each individual understands.
- Developing arrangements for ensuring that information has been communicated and understood e.g., individual assessments.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the induction programme for all new employees and transferees.
- Arrangements for refresher training for existing employees.

2.3 STANDARDS AND PROCEDURES

2.3.1 Planning and Risk Management

Objective

To demonstrate that proactive planning is fundamental to the achievement of HSE management objectives.

How can this be achieved?

- Requiring that a task plan, with an appropriate level of risk assessment, is developed for all work activities.
- Monitoring of the work activities to ensure they are planned and risk assessed and that the plans are followed.
- Developing and implementing MODU/rig specific procedures which enable the organisation or MODU/rig to identify hazards, assess risks and establish controls to ensure that the risks are tolerable to the Drilling Contractor.
- Applying the procedures as appropriate for all routine and non-routine activities and operations involving client and third-party representatives.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements to ensure task plans with risk assessments are developed for all work activities.
- Arrangements for the resources necessary to develop task plans are available.
- Arrangements for supervisors and other line management to monitor work activities.

2.3.2 Management of Change

Objective

To demonstrate HSE implications associated with changes in organisation, procedures or equipment are assessed as part of the change control process.

How can this be achieved?

- Applying hazard identification and risk management principles as part of the change process.
- Defining the roles and responsibilities for initiating and authorizing changes.
- Ensuring open consultation and effective communication with those affected by any change.
- Ensuring that those responsible for HSE critical/hazardous activities accept and take ownership of any changes to those activities.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of the change management procedures.

2.3.3 Emergency Response

Objective

To demonstrate that emergency plans and arrangements are in place to provide effective response to all reasonably foreseeable emergencies (including environmental incidents).

How can this be achieved?

- Identifying foreseeable emergency scenarios (See Part 4 Risk Management).
- Ensuring that for each scenario, emergency plans and procedures for both onshore and offshore are developed and maintained.
- Ensuring the Drilling Contractor is able to respond at any time to emergency situations involving its activities.
- Establishing arrangements for calling on support from external agencies and resources.
- Ensuring personnel are properly trained in emergency management (including spill response) as appropriate.
- Establishing and maintaining a programme of drills and exercises to ensure that arrangements are regularly practiced and tested.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for developing and maintaining the emergency procedures.
- Details of arrangements for establishing contact with external agencies and resources.
- Arrangements for ensuring the competence of personnel with emergency response responsibilities.
- Details of the emergency drills and exercise programmes, including arrangements for reviewing and retaining records.

2.3.4 Permit to Work System

Objective

To demonstrate there is an effective Permit to Work (PTW) system for managing higher risk tasks and activities.

How can this be achieved?

- Defining responsibilities and administrative arrangements for the PTW system.
- Defining the criteria for determining the tasks and activities requiring a PTW.
- Ensuring hazards and controls identified during the Task Risk Analysis (TRA)/Job Hazard Analysis (JHA)/Job Safety Analysis (JSA) process are recorded on the PTW.
- Communicating PTW requirements through pre-tour and pre-task meetings.
- Training personnel in the application of the system.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- A summary of the PTW arrangements for employees, clients, and third-parties.
- Criteria determining when a PTW is required.
- Arrangements for pre-tour and pre-task meetings.
- Details of the PTW training provided.
- Details of the closeout process for PTW's.

2.3.5 Safe Working Practices

Objective

To demonstrate that HSE management associated with tasks, activities and working areas is effective.

How can this be achieved?

- Training personnel on the use of personal protective equipment.
- Referring to relevant sources of information and experience for carrying out similar jobs e.g., procedures, HSE alerts, industry guidance, etc.
- Establishing arrangements for conducting, recording, communicating and reviewing work practice assessments.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Refer to Part 4.7 (Risk Treatment).

2.3.6 Environmental Management

Objective

To demonstrate sound environmental performance by identifying the environmental aspects (hazards) and controlling the environmental impact (risk) of activities and services, and taking into account defined environmental policies and best available practices and technology.

How can this be achieved?

- Ensuring that there are policies, objectives and plans (see Part 2.1 - Policies and Objectives) that address the need to:
 - comply with relevant environmental legislation, regulations and standards
 - comply with contractual environmental requirements
 - manage any significant adverse environmental impacts
- Ensuring environmental requirements are adequately addressed in the shared HSE management processes and supporting documentation, e.g.:
 - HSE plans and programmes
 - job descriptions and responsibilities
 - training and competence
 - internal communication processes
 - operational control procedures and work instructions
 - identification of appropriate Key Performance Indicators
- Developing specific processes to support the implementation and delivery of the environmental plans and programmes, e.g.:
 - environmental monitoring plans
 - measurement and estimation of discharges and emissions (including laboratory and calibration procedures and identification of appropriate 'emissions factors', etc.)
 - spill preparedness and response plans
- Establishing a process for identifying all elements of the MODU or Rig services and activities that can interact with the environment (environmental aspects).
- Recognizing the significance of the nature and location specific sensitivities of the receiving environment in identifying significant adverse environmental impacts.
- Clarifying responsibilities with the client for identifying and assessing site-specific environmental conditions.

- Co-operating with the client on establishing location, or well specific, significant adverse environmental impact criteria.
- Reviewing the MODU or Rig environmental aspects against the site specific criteria and highlight those that may result in a significant adverse environmental impact.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Confirmation that environmental policies, objectives and targets are clearly defined either as part of the organisation's integrated HSE policies and objective statements, or as separate documents.
- Confirmation that the HSE management processes and documentation shared between the Drilling Contractor and the client take account of the environment.
- Details of any environmental specific management processes and programmes.
- Reference to the MODU or Rig environmental aspects registers - (See Part 4 Risk Management).
- Arrangements for liaising with the client for:
 - identifying the nature and sensitivities of the location specific receiving environment
 - establishing location specific significant adverse impact criteria
 - reviewing the MODU or Rig and well specific aspects against the established criteria

2.3.6.1 Environmental Protection

Objective

To demonstrate compliance with regulatory requirements, company policies and standards in relation to the aspects (hazards) and impacts (risks) of environmental protection.

How this can be achieved?

- Identifying regulatory requirements.
- Development of standard environmental protection methods.
- Identifying environmental protection opportunities (including procurement options).
- Evaluating environmental protection options.
- Developing and implementing location and well specific environmental protection plans.
- By establishing processes to review and update the plan.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the Drilling Contractor's environmental protection policies and objectives.
- Details of the environmental protection plan.

2.3.6.2 Management of Waste

Objective

To demonstrate compliance with legal requirements, company policies and standards in relation to the environmental aspects (hazards) and impacts (risks) of waste management.

How this can be achieved?

- Identifying regulatory requirements.
- Development of standard waste tracking methods.
- Identifying waste minimization opportunities (including procurement options).
- Evaluating waste management and disposal options.
- Developing and implementing location and well specific waste management plans in cooperation with the client.

- By establishing processes to review and update the plan.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the Drilling Contractor's waste management policies and objectives.
- Details of the waste management plan.

2.3.7 Occupational Health

Objective

To demonstrate compliance with legal requirements, company policies and standards in relation to occupational health.

How this can be achieved?

- Identifying regulatory requirements.
- Development of occupational health assessment standards related to the Drilling Contractor's Scope of Operations.
- Identifying occupational health hazards related to the Drilling Contractor's Scope of Operations, including client and third-party activities at the MODU/rig.
- Developing and implementing location specific occupational health controls in the workplace.
- By establishing processes to review and update the plan.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the Drilling Contractor's occupational health policies and objectives.
- Details of the arrangements for maintaining and applying Material Safety Data Sheets (MSDS).
- Details of the occupational health controls in the workplace.

2.3.8 HSE Procedures

Objective

To demonstrate that relevant operating procedures are available which define how HSE tasks and activities should be performed.

How can this be achieved?

- Determining the HSE tasks and activities that require written procedures.
- Developing procedures that are relevant, clear, concise and unambiguous.
- Ensuring that HSE procedures are implemented, used, and monitored.
- Periodically reviewing HSE procedures.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for developing, maintaining, implementing and reviewing written HSE procedures.

2.3.9 HSE Communication

Objective

To demonstrate that there is a suitable meeting structure for communicating HSE information throughout the organisation.

How can this be achieved?

- Establishing an HSE communication structure for sharing HSE information company-wide.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of the HSE meeting structure and arrangements with defined responsibilities.

2.3.10 HSE Alerts and Bulletins

Objective

To demonstrate that there are arrangements for issuing HSE alerts and bulletins.

How can this be achieved?

- Establishing arrangements for distributing HSE alerts.
- Establishing arrangements for ensuring actions in HSE alerts are followed up and closed out.
- Sharing relevant HSE information with others.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for issuing and responding to HSE alerts and bulletins.

2.3.11 MODU/Rig Security

Objective

To demonstrate compliance with legal requirements, company policies and standards in relation to the security of the MODU/Rig.

How this can be achieved?

- Identifying regulatory requirements.
- Development of security standards related to the Drilling Contractor's Scope of Operations in cooperation with the client and third-parties at the MODU/rig.
- Identifying security hazards related to the Drilling Contractor's Scope of Operations.
- Developing and implementing location and well specific security plans.
- By establishing processes to review and update the plan.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the Drilling Contractor's security policies and objectives.
- Details of the location security plan (as security measures allow).

2.3.12 Drilling and Well Control Operations

Objective

To demonstrate that suitable arrangements between the Drilling Contractor and the lease holder are in place to ensure all drilling and well control operations will be carried out safely and effectively and with minimum impact on human health and the environment.

How can this be achieved?

- Ensuring personnel involved in the operations are competent.
- Providing relevant drilling and well control procedures.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Information on the competency or training requirements for members of drill crew (and others with drilling/well control responsibilities), including well control qualifications.
- Arrangements for reviewing the drilling and well control procedures (e.g., riser management and shallow gas plans) to be used and agreeing on them with the client.

2.3.12.1 Simultaneous and Combined Operations

2.3.12.1.1 Drilling Contractor – Client HSE Management Interfaces

Objective

To demonstrate that when the client or third-party activities may introduce hazards into the workplace (or affect existing hazards), that the HSE management interfaces will be assessed, and responsibilities and authorities clearly defined and documented to ensure continuous effective risk management.

How can this be achieved?

- Identifying management system interfaces when HSE Management activities or responsibilities meet or transfer across boundaries between the Drilling Contractor, Client and / or third party.
- Clarifying procedures that have to be followed and seeking agreement from all interested parties, particularly with respect to responsibilities and authorities. Use of a Summary of Operation Boundaries (SOOB) could be helpful to define these. (Refer to Part 4.7.3 for more detail on SOOB.)
- Ensuring all relevant personnel involved in the joint activities are informed of and clearly understand the agreed interfaces.
- Determine and define boundaries of responsibility and limits of authority.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Internal arrangements for creating, agreeing and implementing HSE Management interfaces.
- Arrangements for communication of relevant information to operating personnel and the workforce.

2.3.12.1.2 Simultaneous and Combined Operations Risk Assessments

Objective

To demonstrate that any changes to risk profiles caused by simultaneous or combined operations will be identified, assessed and reduced to a level tolerable to the Drilling Contractor.

How can this be achieved?

- Carrying out a hazard and aspect identification exercise of the proposed combined operations to identify new or additional hazards not already addressed in the HSE Case.
- Reviewing and revising existing risk assessments to reflect circumstances created by the simultaneous or combined operations.
- Assessing the revised risk results in relation to the Drilling Contractor's risk tolerability.
- Determining if operations can proceed and include this in the Summary of Operation Boundaries (SOOB).
- Communicating relevant information to personnel involved in the operations.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of arrangements for carrying out reviews and revisions of the Drilling Contractor's Hazard Register from previous structured hazard identification, assessment and control activities to address new planned simultaneous or combined operations. Refer to Part 4 (Risk Management)

2.3.13 Marine Operations and Site Assessment

Objective

To demonstrate that suitable arrangements are in place to ensure all marine operations will be carried out safely and effectively and with minimum impact to the environment.

How can this be achieved?

- Performing location specific assessments e.g., seabed, mooring etc. to assure suitability of the equipment for the operating environment.
- Ensuring personnel involved in marine operations are qualified.
- Providing relevant marine operating procedures.
- Providing supervision for critical/hazardous marine activities.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for acceptance of client provided site specific information and for performing location specific assessments.
- Information on the competency requirements for members of marine crews.
- Information on the marine procedures.

2.3.13.1 Adverse Weather

Objective

To demonstrate that there are clearly defined adverse weather policies.

How can this be achieved?

- Arrangement for systematically estimating probable meteorological and oceanographic extremes that may be encountered.
- Establishing criteria for implementing precautionary measures and imposing operational limits.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- The adverse weather policy.

2.3.13.2 Support Vessels

Objective

To demonstrate that HSE critical/hazardous activities associated with support vessels (attendant, standby, supply, etc.) are effectively managed.

How can this be achieved?

- Co-operating with the client on the management of support vessels.
- Coordinating vessel movements in and around the MODU/rig.
- Involving the standby and other support vessels in regular drills and exercises.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for coordinating support vessels activities.

2.3.14 Engineering Management

Objective

To demonstrate that HSE is a key consideration in engineering projects.

How can this be achieved?

- Ensuring hazard and aspect identification, and risk and environmental impact assessments are included as part of both the short- and long-term project planning and review process.
- Developing and establishing appropriate performance standards for HSE management in Engineering Projects.
- Developing project plans that include relevant HSE information.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of the engineering project management process, including details of hazard and aspect identification, risk and environmental impact assessment requirements.

2.3.15 Lifting Operations and Material Handling

Objective

To demonstrate that all mechanical lifting operations and manual material handling on the rig or MODU are risk assessed and carried out safely, with minimum risk to personnel and the environment.

How can this be achieved?

- Providing suitable lifting equipment.
- Proper maintenance, inspection, testing, and marking of lifting and material handling equipment.
- Training of personnel involved in lifting and material handling operations.
- Developing safe deck management work practices.
- Proper planning, with risk assessments, of lifting operations.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Summary of how mechanical lifting operations are managed including:
 - the competence of crane operators, banksmen, roustabouts, etc.
 - inspection and marking systems
 - procedures for rejecting consignment or delivery of non-conforming loads
 - scope of risk assessments carried out
 - communication arrangements for lifting operations
 - supervision arrangements for different types of lifting operations
 - supervision arrangements for safe deck management
 - manual material handling procedures.
- Details of responsibilities and authorities for manual handling and lifting operations.

2.3.16 Logistics Management

2.3.16.1 Personnel Tracking

Objective

To demonstrate there are administrative arrangements in place to control and co-ordinate the movement of people to/from the rig or MODU.

How can this be achieved?

- Maintaining an administrative capability to plan and co-ordinate the personnel movements with the MODU/rig, client, Drilling Contractor and carrier.
- Maintaining administrative capability to record arrivals and departures of people on board (POB) and provide related information.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of the administrative arrangements for maintaining personnel movements and POB data.

2.3.16.2 Helicopter Operations

Objective

To demonstrate that suitable arrangements are in place to ensure all helicopter operations on, or in connection with, the rig or MODU will be carried out safely and effectively.

How can this be achieved?

- Assigning qualified Helicopter Landing Officers (HLOs) to supervise and coordinate all helideck operations.
- Ensuring that personnel are competent in Helicopter Operations prior to undertaking the HLO's role.
- Providing helideck procedure manuals addressing both routine and emergency helicopter operations.
- Maintenance and Inspection of helideck and associated safety equipment.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Information on the helideck operation arrangements and limits.

2.3.17 Hazardous and Radioactive Substances

Objective

To demonstrate that suitable arrangements are in place for storing, handling and using hazardous and radioactive substances.

How can this be achieved?

- Ensuring relevant Material Safety Data Sheets (MSDS) are supplied with all hazardous and radioactive substances.
- Providing identified and dedicated storage facilities, including appropriate bunding/secondary containment for liquids.
- Carrying out suitable risk assessments on the storage, usage and transportation of hazardous and radioactive materials to minimize potential exposure.
- Providing a system to track and document usage and discharge of chemicals in compliance with regulatory requirements.

- Ensuring suitable equipment to minimize exposure, including personal protective equipment, is provided, maintained, and available for use and used when appropriate.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for storing, handling and using chemicals and other hazardous substances (including radioactive materials).
- Arrangements for the selection, maintenance and use of Personal Protective Equipment (PPE) (including training).

2.3.18 Procurement Management

Objective

To demonstrate purchased goods and services meet the relevant HSE management objectives.

How can this be achieved?

- Assessing vendor HSE/QA arrangements as part of selection process.
- Reviewing purchased goods and services against standards.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for selection and monitoring of vendor performance.
- Arrangements for reporting design or manufacturing defects to vendors.

2.3.19 Maintenance Management

Objective

To demonstrate that arrangements are in place which ensure that the MODU or rig, its equipment and in particular the equipment/systems which are HSE critical, are effectively maintained.

How can this be achieved?

- Establishing a maintenance management system that includes the MODU or rig structure, systems and equipment.
- Identifying the HSE critical equipment/systems. (See Part 3.)
- Defining the performance standards for each HSE critical equipment/system.
- Establish management of change procedures when HSE critical equipment/systems do not meet performance standards.
- Developing procedures (with scheduling) that ensure that the HSE critical equipment is maintained.
- Performing and documenting maintenance as per the schedule.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of the maintenance management system.
- Arrangements for identifying the HSE critical systems and determining their performance standards (See Part 2.4.6 - Verification).
- Arrangements for implementing Management of change procedures when HSE critical equipment/systems do not meet performance standards.

2.3.20 Contractor Management

Objective

To demonstrate that contractor HSE performance is effectively managed.

How can this be achieved?

- Identifying, agreeing and communicating the HSE interfaces and responsibilities with contractors.
- Monitoring and auditing of contractor HSE performance.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Arrangements for ensuring HSE Management interfaces between the Drilling Contractor and their contractors are identified and agreed upon.
- Arrangements for monitoring and auditing contractor HSE performance.

2.4 PERFORMANCE MONITORING

2.4.1 Periodic Monitoring

Objective

To demonstrate arrangements are in place for monitoring HSE performance.

How can this be achieved?

- Ensuring HSE performance is reviewed by senior management.
- Line managers and supervisors monitoring compliance with procedures and standards.
- Establishing programme of workplace inspections.
- Identifying proactive and reactive performance measures which provide an indication of current performance and act as indicators of future performance.
- Regularly assessing the performance, identifying trends and implementing improvements. Performance standards should embrace both technical systems and human performance.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Information on line manager's and supervisor's responsibilities for continuous monitoring of compliance with HSE procedures and standards.
- Details of workplace inspection schemes.
- Details of the proactive (leading) HSE performance indicators.
- Details of arrangements for recording and analyzing HSE performance.
- Details of the arrangements for discussing and reviewing HSE performance at the different levels within the organisation from both a technical and human performance perspective.

2.4.2 Incident Reporting and Analysis

Objective

To demonstrate that there are arrangements for reporting, analysing and learning from incidents and work related illnesses.

How can this be achieved?

- Developing and maintaining procedures for reporting and trending HSE incidents, including near misses, as well as those incidents involving chronic health and environmental risk management (e.g., noise, repetitive strain, frequent spillages, waste non-conformances, etc.)

- Developing criteria for establishing incident (potential) risk and significance to the business.
- Establishing procedures for investigating and analyzing incidents and work-related illnesses
- Providing relevant training to personnel involved in incident investigation and analysis.
- Identifying the immediate causes (the failed barriers) and underlying system level weaknesses that result in significant incidents
- Developing and implementing recommendations to correct both the identified failed barriers and the weaknesses systemic to the organization to prevent related incidents from recurring.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- A summary of the incident reporting and investigation arrangements (that meet Drilling Contractor, client, and regulatory requirements).
- Details of the potential incident criteria that is used.
- Information on the training provided for incident investigation team members.
- Information on the methodology adopted to identify incident causes.
- Description of the arrangements for tracking action items arising from investigations to completion.

2.4.3 Behaviour-Based Observation Systems

Objective

To demonstrate that members of the workforce are encouraged to monitor HSE practices through a structured behaviour based observation process.

How can this be achieved?

- Implementing a suitable observation and monitoring process.
- Providing training and instruction on the application of the process.
- Taking action on the issues identified through the process.
- Providing feedback to people raising issues through the process.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the behaviour based observation process.
- Training and instruction given to employees and contractors on its application.
- Details of the arrangements for processing and reviewing issues identified through the process.

2.4.4 Environmental Monitoring and Measurement

Objective

To demonstrate that the environmental impact of discharges and emissions are being adequately monitored and measured.

How can this be achieved?

- Where discharges or emissions are measured at the worksite; to ensure that the measurements are documented and meet applicable regulatory requirements.
- Where discharges or emissions are estimated; to ensure that the methods of estimation are documented and appropriate.

- Where discharges or emissions are directly measured, to ensure that measurement equipment is being correctly operated and calibrated according to documented procedures.
- Where background environmental monitoring is taking place; to ensure that sampling and analysis procedures are documented and based on sound field practices.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the arrangements for monitoring discharges and emissions which have the potential to cause adverse environmental impacts.

2.4.5 Audit and Audit Compliance

Objective

To demonstrate effective arrangements are in place for internal and external (as applicable) auditing of the HSE Management objectives.

How can this be achieved?

- Developing and maintaining an audit programme.
- Ensuring competent and independent (external to the location) auditors are appointed to lead audits.
- Establishing arrangements for following up and closing out audit findings.
- Communicating audit results to senior management, and to the departments and locations audited.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the audit programme.
- Criteria for selection and training of audit team members.
- Details of the arrangements for planning, execution and reporting of HSE audits.
- Details of the arrangements for tracking actions arising from audits.

2.4.6 Verification of HSE Critical Activities/Tasks and Equipment/Systems

Objective

To demonstrate that arrangements are in place for verifying HSE critical activities/tasks and equipment/systems remain effective.

How can this be achieved?

- Identifying HSE critical activities/tasks and equipment/systems.
- Establishing suitable arrangements for internal verification of the effectiveness of HSE critical activities/tasks and equipment/systems.
- Establishing suitable arrangements for external verification of the effectiveness of HSE critical activities/tasks and equipment/systems.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- List of the HSE critical tasks, activities, equipment, and systems. (See also Part 4).
- Details of the arrangements for internal and external verification of the effectiveness of HSE critical activities/tasks and equipment/systems.

2.4.7 Certification

Objective

To demonstrate that:

- The MODU/rig and its equipment complies with Flag State requirements.
- The MODU/rig and its equipment complies with classification requirements.
- The MODU/rig and its equipment complies with Coastal State requirements.

How can this be achieved?

- Maintaining classification, Flag State, and Coastal State standards and requirements.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details on current status of MODU/rig and equipment certification.

2.5 MANAGEMENT REVIEW AND IMPROVEMENT

2.5.1 Review

Objective

To demonstrate that senior management periodically review the effectiveness of the HSE Management arrangements against the policies, objectives and plans.

How can this be achieved?

- Establishing arrangements for senior management to periodically review the overall HSE Management performance.
- Ensuring that the senior management has ready access to all relevant HSE information, data, and analysis.
- Ensuring the review findings are an input to the development of any revised HSE objectives and plans.
- Documenting the results of the senior management review.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the arrangements for carrying out the management review of the HSE Management objectives.
- Arrangements for reporting the review findings, and incorporating the findings into the HSE management objectives.

2.6 ATTACHMENTS

- *Document Control and Document Hierarchy*
i.e. Description or diagram showing the hierarchy of HSE risk management documents.
- *Listing of HSE Management Support Documents and Manuals*
i.e. Titles of the company's main HSE procedures, manuals, etc.
- *Organisation Charts*
i.e. Organigram showing the MODU/rig and support organisations.

MODU OR RIG DESCRIPTION AND SUPPORTING INFORMATION

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3.0 INTRODUCTION

The HSE Case needs to demonstrate that HSE management objectives are met.

Parts 2, 3 and 5 of these Guidelines present HSE Management objectives that have been determined through experience by IADC members as those necessary to demonstrate assurance that risks in the Drilling Contractor's Scope of Operation are at a level tolerable to the Drilling Contractor. These HSE management objectives must be taken into consideration and evaluated during the Risk Assessment in Part 4 of these guidelines.

By evaluating these HSE management objectives in Part 4, the Drilling Contractor either:

- Demonstrates assurance that HSE management objectives are being met, or
- Identifies where arrangements to meet HSE management objectives are ineffective or not in place, and what compensatory measures are necessary to meet all the HSE management objectives.

A Drilling Contractor may identify additional controls to meet HSE management objectives during the Risk Assessment described in Part 4 of these Guidelines.

Part 2 contains HSE management objectives relating to procedural (human factor) controls and Part 3 contains descriptions of the equipment and systems (hardware factors) to meet the HSE management objectives.

Part 3 describes the equipment and systems necessary to meet the HSE management objectives described in Parts 2 and 5. The equipment and systems must be considered in Part 4.

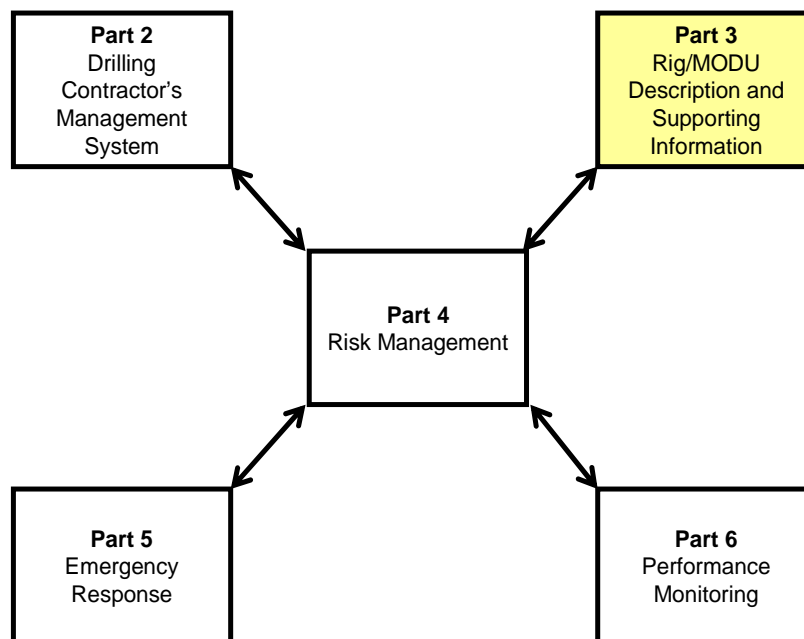


Figure 3.0.1 – HSE Management Assurance

To provide assurance that the Drilling Contractor is managing HSE effectively, Parts 2, 3, 5, and 6 must be applied in conjunction with a structured risk assessment process as described in Part 4..

The HSE Case should include or reference supporting information describing the MODU or rig, its systems and equipment. In this context, early consultation with the relevant national

regulatory agency is recommended to ensure the adequacy of included or referenced material.

The information should relate to the hazards and environmental impacts which have been identified in Part 4 (Risk Management) of these Guidelines and the listing of HSE critical equipment and systems.

The HSE Case should include sufficient detail to enable a reviewer to recognize the arrangements and equipment provided to control or mitigate such an event or environmental impact.

HSE Equipment and Systems

GENERAL INFORMATION

- MODU or Rig Details
- Certification, Classification and Registration
- MODU or Rig Layout
- Modifications and Upgrades
- Selection of HSE Critical Equipment/Systems

PRIMARY STRUCTURE

- Environmental Operating Limits/Design Criteria
- Structural Integrity
- Marine Integrity – Self Elevating Units (Jack-Ups)
 - Stability (Jack-Ups)
 - Ballast and Bilge Systems (Jack-Ups)
 - Foundation Stability (Jack-Ups)
 - Towing (Jack-Ups)
- Marine Integrity – Floating Units (Semi-Submersibles and Drillships)
 - Stability (Semi-Submersibles and Drillships)
 - Ballast and Bilge Systems (Semi-Submersibles and Drillships)
 - Mooring and Station Keeping (Semi-Submersibles and Drillships)
 - Propulsion Systems (Semi-Submersibles and Drillships)
 - Towing (Non-Self-Propelled Semi-Submersibles)

DRILLING, COMPLETION AND WELL CONTROL

- Hoisting and Tubular Handling
- Mud and Cement System
- BOP Systems
 - Managed Pressure Drilling Systems
 - High Pressure High Temperature (HPHT) Wells
 - Deepwater Wells
- Subsea Completion Tree and Handling Systems

PLANT AND UTILITIES

- Power Generation and Distribution
- Fuel/Lube Oil System
- Rig Air System
- Heating Ventilation and Air Conditioning (HVAC) Systems
- Drain, Effluent and Waste Systems
- Communications
- Emergency Lighting
- Helideck Facilities
- Lifting Equipment and Material Handling
- Storing and Handling of Explosives/Flammables and Other Hazardous Substances

FIRE AND EXPLOSION PROTECTION

Hazardous Area Classifications
Detection Systems
Emergency Shut Down Systems
Active Fire Protection
Passive Fire Protection
Temporary Refuge

EVACUATION AND ESCAPE SYSTEMS

ACCOMMODATION

WELL TESTING

Well Testing
Extended Well Tests

DIVING SUPPORT (WHERE APPLICABLE)

Diving Support Vessels

OTHER THIRD PARTY EQUIPMENT

Wireline Units
Cement Units
ROV Unit
Cuttings Handling Equipment
Mud Logging Units
H₂S Equipment

3.1 GENERAL INFORMATION

3.1.1 MODU or Rig Details

Objective

To provide an overview of the MODU or Rig to which the HSE Case applies.

What should be (referenced) in the HSE Case?

- MODU or Rig type.
- Where and when built.
- Description of the activities normally performed on or from the MODU or Rig (Drilling Contractor's Scope of Operations).
- Safe manning levels for marine operations.

3.1.2 Certification, Classification and Registration

Objective

To demonstrate that the MODU or Rig complies with applicable internationally recognized Certification, Classification and Flag State standards.

What should be (referenced) in the Case?

- Details of the extent to which the MODU/rig and its equipment/systems are subject to certification or examination by a classification society.
- Nation of registration (if under registry).

- Details of the extent to which the MODU/rig and its equipment/systems are subject to Flag State certification, including, where appropriate, ISM Code and/or ISPS Code compliance.
- Deviations from design specification and / or formal exemptions given from the relevant flag state authority, including any operational limitations imposed.

3.1.3 MODU or Rig Layout

Objective

To provide information of the MODU/Rig layout, and relative positions of primary equipment and HSE equipment/systems.

What should be (referenced) in the Case?

- Description of the MODU or Rig layout with specific reference to features that may affect its HSE Management.
- Layout drawings showing relative positions of the primary equipment and HSE equipment/systems.

3.1.4 Modifications and Upgrades

Objective

To provide information of any modifications or upgrades which have significantly changed the MODU's or Rig's originally designed operating capabilities or have affected its HSE Management.

What should be (referenced) in the Case?

- Description of any modifications or major upgrades that may have affected the MODU's/Rig's HSE Management.
- Deviations from design specification and / or formal exemptions given from the relevant flag state authority, including any operational limitations imposed.

3.1.5 Selection of HSE Critical Equipment/Systems

Objective

To describe how the Drilling Contractor selects equipment/systems that have been determined to be HSE critical.

What should be (referenced) in the HSE Case?

- Summary of how HSE critical equipment/systems have been identified (See Part 4.7.2 Risk Optimisation Strategies; Part 2.4.6 Verification).
- Descriptions of arrangements for ensuring HSE critical equipment/systems comply with Flag or Coastal State requirements.
- Descriptions of arrangements for ensuring HSE critical equipment/systems comply with relevant codes and standards e.g. API, ISO, NACE, ASME, etc.

3.2 PRIMARY STRUCTURE

3.2.1 Operating Limits/Design Criteria

Objective

To state the range of operating conditions within which the MODU or Rig has been designed to operate.

What should be (referenced) in the HSE Case?

- Information on the national regulations and International Codes and Standards used to assess the design and construction of the MODU/Rig.
- Limiting environmental operating criteria, i.e., wind, temperature, sea states and water depths. (Other environmental operating criteria, e.g., drilling, helicopter, lifting operations are considered under the relevant headings below.)

3.2.2 Structural Integrity

Objective

To show that the MODU's or Rig's structures have been designed and are maintained for the stated operating and environmental conditions.

What should be (referenced) in the HSE Case?

- Description and, where appropriate, fire ratings of the main structural components.
- Details of:
 - MODU's or Rig's design life expectancy.
 - primary dimensions and construction materials.
 - integrity analyses including, where appropriate, fatigue studies.
 - corrosion monitoring and protection systems.
 - leak detection systems.
 - inspection/NDT and survey programs.

3.2.3 Marine Integrity - Self Elevating Units (Jack-Ups)

3.2.3.1 Stability (Jack-Ups)

Objective

To demonstrate that the MODU's stability characteristics are suitable for the stated operating environment.

What should be (referenced) in the Case?

- Details of standards and criteria used in determining the intact and damage stability characteristics.
- Reference to the Marine Operations Manual for details of inclining tests and/or deadweight surveys and demonstration of compliance with stability criteria during normal operating conditions, and the lightship data alterations log.
- Damage stability limits and conditions.
- Information on weather-tight and watertight closures, with details of the open/close status monitoring.

3.2.3.2 Ballast and Bilge Systems (Jack-Ups)

Objective

To describe the arrangements for both normal and emergency ballasting and bilge operations.

What should be (referenced) in the HSE Case?

- Description, with line drawings, of normal and emergency ballast and bilge arrangements
- Arrangements for keeping bilges clean and free of materials.

3.2.3.3 Foundation Stability (Jack-Ups)

Objective

To describe the arrangements to be used for location site assessment and for assessing foundation stability.

What should be (referenced) in the HSE Case?

- Details of the Jacking System.
- Arrangements for:
 - obtaining and analyzing geotechnical data and information from seabed surveys.
 - calculating leg bending moments, penetration, pre-loading etc.
 - pre-loading when on location (both open location and alongside existing structure).
 - assessing unexpected conditions that may arise.
 - monitoring conditions (leg loads, scouring, etc.) while on location.

3.2.3.4 Towing (Jack-Ups)

Objective

To describe the arrangements for moving the MODU between locations.

What should be (referenced) in the HSE Case?

- Details of pre-move procedures including removing/securing of deck cargo and preventing water ingress.
- Description of MODU towing arrangements (including arrangements for personnel with specific tasks and responsibilities {e.g. person in charge}).
- A description of the pre-movement process for developing contingency planning arrangements and criteria, including command structure.
- Details of the arrangements for selecting assisting vessels and equipment.

3.2.4 Marine Integrity – Floating Units (Semi-Submersibles and Drillships)

3.2.4.1 Stability (Semi-Submersibles and Drillships)

Objective

To demonstrate the MODU's stability characteristics are suitable for the stated environmental and operating conditions.

What should be (referenced) in the HSE Case?

- Details of standards and criteria used in determining the intact and damaged stability characteristics.
- Details of inclining tests and/or deadweight surveys and demonstration of compliance with stability criteria during normal operating conditions, and the lightship data alterations log, i.e., as in the Marine Operations Manual
- Details of the damaged stability limits and conditions.
- Information on weather-tight and watertight closures, with details of the open/close status monitoring.

3.2.4.2 Ballast and Bilge Systems (Semi-Submersibles and Drillships)

Objective

To describe the arrangements for both normal (primary and secondary) and emergency ballasting and bilge operations.

What should be (referenced) in the HSE Case?

- Description, with piping and instrumentation diagrams (P & ID's) , including piping arrangement drawings, of the main and emergency ballast and bilge system which includes:
 - layout and capacities of tanks
 - location and capacities of the pumps which can be used for ballasting and bilge operations
 - details of the ballasting and bilge pumps that can be powered from the emergency supply
 - operation of the primary control valves
 - minimum times required to change from operating and transit drafts to survival draft
 - description of the environmental operating criteria (e.g., maximum heel and list for pumping, etc.)
 - arrangements for monitoring ballast conditions
 - arrangements for keeping bilges clean and free of materials.

3.2.4.3 Mooring and Station Keeping (Semi-Submersibles and Drillships)

Objective

To describe the arrangements and equipment for mooring and station keeping.

What should be (referenced) in the HSE Case?

- For the mooring system:
 - arrangements for carrying out seabed surveys and mooring assessments
 - description of the components that may be utilized
 - arrangements for monitoring mooring line tensions
- Arrangements for monitoring riser angles.
- Details of any emergency mooring release systems.
- Where thrusters can be used to assist with station keeping, a description of the arrangements and capabilities.
- For dynamic positioning, description of the system arrangements highlighting the main safety features, operational procedures, operating guidelines, power management, and equipment limitations.
- Description of the process for developing environmental operating criteria (e.g., riser angle, watch circle, riser tension, heave, etc.)

3.2.4.4 Propulsion Systems (Semi-Submersibles and Drillships)

Objective

To describe the MODU's propulsion capabilities.

What should be (referenced) in the HSE Case?

- Details of the MODU propulsion or propulsion-assist system.
- Where the MODU is capable of independent relocation, or in assisting in its movement, information on how and when the propulsion systems will be used.
- Details of DP Classification (DP0, DP1, DP2, DP3) if applicable.

3.2.4.5 Towing or Transit (Semi-Submersibles and Drillships)

Objective

To describe the arrangements for moving the MODU between locations.

What should be (referenced) in the HSE Case?

- Details of pre-move procedures including securing of deck cargo and watertight closures.
- Description of the MODU towing/transit arrangements (including arrangements for person in charge).
- Description of the pre-movement process for developing contingency planning arrangements and criteria, including command structure.
- Details of the arrangements for selecting assisting vessels and equipment (if applicable).

3.3 DRILLING, COMPLETION AND WELL CONTROL

3.3.1 Hoisting and Tubular Handling

Objective

To describe the hoisting and pipe handling arrangements and capabilities.

What should be (referenced) in the HSE Case?

- General description, with details of ratings/capability and relevant standards of the:
 - derrick structure
 - hoisting system
 - compensators
 - top drive and rotary systems
 - tubular handling systems
 - mechanised operations
- Details of the equipment/systems which may affect the MODU's/Rig's HSE Management.

3.3.2 Mud and Cement System

Objective

To describe the mud system arrangements and capabilities.

What should be (referenced) in the HSE Case?

- Description, with details of ratings/capacities and relevant standards (API or ISO) of the:
 - mud pits
 - mud pumps
 - mud lines (including choke and kill manifold)
 - mud treatment system (shale shakers, mud cleaners, degassers, etc.)
 - trip tanks
 - mud/gas separators
 - cement unit interfaces
- Line drawings of the mud and cement system.
- Description of mud/well monitoring systems.
- Details of any mud treatment equipment/systems that discharge to the environment.

- Details of any dust and chemical extraction systems to separate personnel from the mud mixing materials.
- Identification of additional components preventing loss of containment / spillage (valve lockout / tagout, bunding, blanks, etc).

3.3.3 Blow Out Preventer (BOP) Systems

Objective

To describe the BOP and diverter arrangements and capabilities.

What should be (referenced) in the HSE Case?

- Description, with details of ratings of the:
 - BOP
 - BOP control systems
- Statement that the BOP and its control system were designed to API Standard 6A and 16D or equivalent.
- Confirmation that BOP system is maintained in accordance with API RP 53 or equivalent.
- Details of diverter systems and statement that it was designed to API Standard 16D or equivalent.
- Details of any control systems that vent control fluid to the marine environment.
- Details of arrangements for Managed Pressure Drilling Systems (if applicable)
- Details of arrangements for High Pressure High Temperature (HPHT) Systems (if applicable)
- Details of arrangements for Deepwater Wells (if applicable)
- Details of arrangements for surface BOP (if applicable).

3.3.4 Subsea Completion Tree and Handling Systems

Objective

To describe the subsea completion tree and handling systems arrangements and capabilities.

What should be (referenced) in the HSE Case?

- Description, with details of ratings and limitations of the:
 - Subsea completion tree and control system (used in the HSE Case)
 - Tree handling systems
- Arrangements for requesting statement from the client that the subsea completion tree and its control system were designed to specified requirements.
- Detailed description of subsea completion tree handling system.

3.4 PLANT AND UTILITIES

3.4.1 Power Generation and Distribution

Objective

To describe the power generation and distribution systems for drilling, marine, and emergency operations.

What should be (referenced) in the HSE Case?

- Description and ratings of the main power generation arrangements (including power plant reliability information) and power assignment arrangements (e.g., thrusters, draw-works, mud pumps, etc.).
- Details of the main power distribution protective systems
- Details of the emergency generator(s), including:
 - rating and endurance at rated and anticipated emergency load
 - start up arrangements
 - equipment powered from the emergency system
 - load shedding arrangements
- Single line diagrams of the main and emergency power arrangements.
- Information on Uninterruptible Powered Systems (UPS).
- Arrangements for recovering from “dead ship” conditions.
- Information on estimating atmospheric emissions.

3.4.2 Fuel/Lube Oil System

Objective

To describe the fuel/lube oil storage and transfer arrangements.

What should be (referenced) in the HSE Case?

- Description of the fuel/lube oil storage tanks and transfer arrangements.
- Description of arrangements for fuel sampling and retention (including sulphur percentage if applicable).
- Description of arrangements for bunkering, including use of delivery notes.
- Details of safety, alarm and shut-off devices fitted to the system.
- Identification of components preventing loss of containment/spillage (valve lockout/tagout, banded hose storage areas, hose inspection, metering, etc.).

3.4.3 Rig Air System

Objective

To describe the rig air arrangements.

What should be (referenced) in the HSE Case?

- Description of the rig air compressors (primary and emergency), storage and distribution systems and related safety devices.
- Details of the HSE critical equipment/systems fed from the rig air system.

3.4.4 Heating Ventilation and Air Conditioning (HVAC) Systems

Objective

To describe the MODU or Rig HVAC systems which are provided to:

- prevent flammable and toxic gasses accumulating in enclosed spaces
- prevent smoke or gas ingress to the temporary refuge
- maintain air quality and temperature in living and working spaces

What should be (referenced) in the HSE Case?

- Description of the HVAC system which includes details of the:
 - ventilation of enclosed workplaces, including local extraction of fumes, dust, etc.
 - location of smoke and gas detection systems on air intakes, with particular reference to the Temporary Refuge (TR) and other normally manned work areas
 - automatic and manual shutdown arrangements
 - arrangements for filtering to ensure air quality
 - arrangements for cleaning and disinfection of air ducts

3.4.5 Drain, Effluent and Waste Systems

Objective

To describe the arrangements for handling:

- accumulations of fluids on decks and in mud handling areas.
- machinery space drainage
- helideck drainage, if equipped for refuelling
- cuttings and other accumulations of solids (including 'skip-and-ship', re-injection equipment where applicable)
- sewage and grey water
- segregation and storage of other waste (e.g., hazardous waste segregation, netting for open skips, drumsavers, etc).

What should be (referenced) in the HSE Case?

- Description of the drainage system(s).
- Arrangements for handling or discharge of cuttings.
- Arrangements for separation of hazardous/non-hazardous drains.
- Arrangements for handling, segregation and storage of other waste (including hazardous waste).
- Description of black and grey water sewage treatment and overboard monitoring facilities.

3.4.6 Communications

Objective

To describe the communication systems available, for both normal and emergency communications.

What should be (referenced) in the HSE Case?

- Details of both the main and back-up systems for communication:
 - within the MODU or Rig, e.g., alarms, signals, public address, telephones, radios, drill crew communication systems
 - between the MODU/rig and other installations, supporting aircraft and vessels
 - between the MODU/rig and remote support locations
- A description of the arrangements for verifying communication with other installations, supporting aircraft and vessels, remote support locations, and emergency services,

3.4.7 Emergency Lighting

Objective

To describe the emergency lighting arrangements.

What should be (referenced) in the HSE Case?

- Description of the emergency lighting systems, including how they are powered, their area of coverage and duration.

3.4.8 Helideck Facilities

Objective

To describe the helideck facilities.

What should be (referenced) in the HSE Case?

- Description of helideck facility.
- Details of lighting and markings.
- Confirmation that the helideck has been assessed to international regulatory standards and relevant regulatory standards for the regions of operation, including a list of the models of helicopter which may be authorized to utilize the helideck.
- Details of the emergency equipment provided to mitigate and recover from helicopter incidents.
- Details of operational conditions that limit the use of the helideck, including structural loading limits.

3.4.9 Lifting Equipment and Material Handling

Objective

To describe the material handling arrangements and capabilities and how they may affect HSE Management.

What should be (referenced) in the HSE Case?

- Details, with ratings of the:
 - main deck cranes
 - tubular handling equipment (See also 3.3.1 above)
 - BOP crane
 - utility and man-rider winches
 - other material handling equipment
- Details of related safety and ergonomic devices.
- Confirmation that the material handling equipment is subject to regular inspection and testing.

3.4.10 Storing and Handling of Explosives/Flammables and Other Hazardous Substances

Objective

To describe arrangements for storing and handling explosives, flammable materials and other hazardous materials.

What should be (referenced) in the HSE Case?

- Description and location of the explosive storage facility.
- Description and location of radioactive material storage facility (including security arrangements).
- Details of facilities provided for storing flammables and other hazardous substances.

- Details of the fire detection and protection in these areas.
- Details of equipment and materials provided for containing accidental spills and releases.

3.5 FIRE AND EXPLOSION PROTECTION

3.5.1 Hazardous Area Classifications

Objective

To define the areas which have been classified as hazardous including the rated classification.

What should be (referenced) in the HSE Case?

- Details of the standards used to identify hazardous areas.
- Rating of the hazardous areas in relation to use of Explosion Proof and intrinsically safe equipment
- Procedures for assessing the suitability and use of temporary (third party) equipment.
- Drawing(s) of the designated hazardous areas.
- Demonstration that hazardous area arrangements have been approved by classification society and/or regulators.

3.5.2 Detection Systems

Objective

To describe systems available for early detection of smoke/fire and for detection of flammable (and other hazardous) gases.

What should be (referenced) in the HSE Case?

- Description of the fire detection systems, including details of:
 - detection thresholds
 - sensors types and locations
 - indicator panel locations
 - actions automatically initiated on detection (as applicable)
 - frangible head sprinkler systems
 - maintenance, testing and calibration.
- Description of the fixed and portable Oxygen (O₂), Hydrocarbon (HC) and Hydrogen Sulphide (H₂S) detection systems/instruments including details of:
 - locations of gas detection heads
 - detection thresholds
 - indicator panels locations
 - actions initiated automatically on detection of HC and/or H₂S (as applicable)
 - maintenance, testing and calibration.

3.5.3 Emergency Shut Down Systems

Objective

To describe the Emergency Shut Down (ESD) systems.

What should be (referenced) in the HSE Case?

- Description of the ESD philosophy.

- Details of the automatic and manually activated shut down arrangements (including locations).
- The shutdown hierarchy arrangements and definitions of the different levels of shutdown and the equipment effected at each level, including Cause and Effect Diagrams.

3.5.4 Active Fire Protection

Objective

To describe the active fire protection systems.

What should be (referenced) in the HSE Case?

- Description and drawings, of the active fire fighting systems including:
 - fire pump capacities and locations
 - fire main isolation arrangements
 - hydrant and monitor locations
 - deluge systems
 - helideck foam systems
 - other fixed systems e.g., CO₂. (engine room, emergency generator spaces, paint locker, etc.)

3.5.5 Passive Fire Protection

Objective

To describe the passive fire protection systems.

What should be (referenced) in the HSE Case?

- Description of passive fire protection systems including:
 - drawing showing location and rating of fire resistant bulkheads, decks, and deckheads
 - details of any structural fire protection for load bearing structures
 - details of unprotected non-loading bearing structures and decks which have a role in controlling fires
 - details of any HSE critical equipment/systems that has passive fire protection
 - the use of non-flammable materials in accommodation and other occupied areas.

Note: The passive fire protection arrangements of the IMO MODU Code (1979, 1989 and 2009) do not contemplate a prolonged hydrocarbon fire as may result from ignition of a blowout.

3.5.6 Temporary Refuge

Objective

To describe the Temporary Refuge (TR) arrangements which offer protection against an escalating major incident.

What should be (referenced) in the HSE Case?

- Description of the TR integrity requirements (See also Part 5 Emergency Response).
- Drawing showing the lay out and physical boundaries of the TR.

3.6 EVACUATION AND ESCAPE SYSTEMS

Objective

To describe the Evacuation and Escape systems that are provided in the event of a major incident which results in the evacuation of the MODU or Rig. (See Part 5 Emergency Response)

What should be (referenced) in the HSE Case?

- Drawing(s) showing the main routes of access/egress between the TR and designated evacuation and escape points.
- Confirmation that these routes are equipped with suitable main and emergency lighting.
- Confirmation that these routes have been assessed for the potential effects of fire and blast.
- Description of the TEMPSC (Totally Enclosed Motor Powered Survival Craft)/Lifeboat arrangements (as applicable).
- Description of the Man Overboard Boat (MOB) arrangements (as applicable).
- Description of life raft arrangements and other alternative escape routes to the sea.
- Confirmation that evacuation and escape equipment complies with the IMO MODU Code standards, or other equivalent and applicable standards.
- The provision of stand-by vessels and logistical support vessels' in evacuation (See also Part 5 Emergency Response).

3.7 ACCOMMODATION

Objective

To provide information on the accommodation facilities for personnel working on the MODU or Rig.

What should be (referenced) in the HSE Case?

- Details of number of bed spaces available, including number of beds per cabin and number of personnel assigned to each cabin.
- Description of accommodation facilities.
- Description of safety equipment in accommodation facilities (e.g., immersion suits, life jackets, smoke hoods, fire extinguishers, etc.)
- Descriptions of the arrangements made to preserve the health of the personnel within the accommodations.
- Details of the potable water system and arrangements, including methods used to ensure quality of potable water.
- The installation rating for maximum number of persons (in compliance with Flag and Coastal State requirements).

3.8 WELL TESTING

Objective

To describe the arrangements for installing well testing equipment on the MODU or Rig.

What should be (referenced) in the HSE Case?

- Description of arrangements for assessing equipment, systems, and layout for well tests and extended well tests.

- Description of well testing set up and lay outs that have been assessed for the HSE case.
- Details of the typical interfaces between the 3rd party well testing equipment and the MODU or Rig detection and protection systems.

3.9 DIVING SUPPORT

Objective

To describe the arrangements for onboard diving support and for interacting with diving support vessels.

What should be (referenced) in the HSE Case?

- Descriptions of arrangements for interfacing with diving support vessels.
- Description of a typical diving spread set up which may have been assessed in the HSE Case (if applicable).
- Details of the interfaces between the 3rd party diving spread and the MODU detection and protection systems, DP systems, etc.

3.10 OTHER THIRD PARTY EQUIPMENT

Objective

To describe the arrangements for locating 3rd party equipment on the MODU or Rig.

What should be (referenced) in the HSE Case?

- Arrangements for:
 - reviewing/approving the status/condition of 3rd party equipment that may affect HSE management, prior to installation, including:
 - wireline units.
 - cement units.
 - ROV units.
 - cuttings handling equipment.
 - mud logging units.
 - H₂S equipment.
 - any other third party equipment that may be installed on the rig/MODU.
 - checking interfaces between the 3rd party equipment and existing MODU/rig systems.
- Description of equipment that have been included in the risk assessment in Part 4.
- Details of the interfaces between the typical 3rd party equipment and the MODU or Rig.

RECOMMENDED DRAWING LIST

A list has been developed and displayed in Appendix 3 - Drawings and Schematics. It is only intended as a guide to the drawings that should be considered for inclusion or reference in the HSE Case.

4 RISK MANAGEMENT

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4.1 INTRODUCTION

Objective

To describe the purpose and benefits of assuring HSE management is integrated into a Drilling Contractor's operation by developing an HSE Case.

Discussion

An HSE Case has two primary purposes:

1. Demonstrate internal assurance within the Drilling Contractor's organization that its management system's risk reducing controls related to the Health, Safety and Environment aspects of its operations, meets its senior management's expectations.
2. and, where applicable: demonstrate to the Drilling Contractor's external stakeholders that its management system's risk reducing controls meet stakeholder's expectations.

The HSE Case demonstrates how a Drilling Contractor's organization applies a systematic risk management approach to maintain and improve HSE and operational performance. Developing and maintaining an HSE Case provides continuous assurance that existing HSE risks are effectively managed, and provides assurance that risks associated with changes to equipment, activities or locations, as well as systemic weaknesses identified by incident analyses and audits will be effectively managed.

The benefits to a Drilling Contractor completing an HSE Case are:

- Identification of the sources of the HSE hazards included in the Drilling Contractor's Scope of Operations;
- Assessment of the risks associated with hazards and sources of hazards and effectiveness of the controls within the Drilling Contractor's management system (documented and experienced based work practices). (See Parts 2, 3, and 5 of these Guidelines.) Verification to ensure that identified risks are reduced to a level that does not exceed the Drilling Contractor's tolerability limits for safe operations.
- Verification of compliance with applicable regulatory and contractually agreed HSE requirements.

Part 4 describes the Risk Management Process for assuring that the risks associated with a Drilling Contractor's Scope of Operations are reduced to a level that is tolerable to the Drilling Contractor and its stakeholders. The Risk Management Process must consider the HSE management objectives described in Part 2 and the systems and equipment described in Part 3.

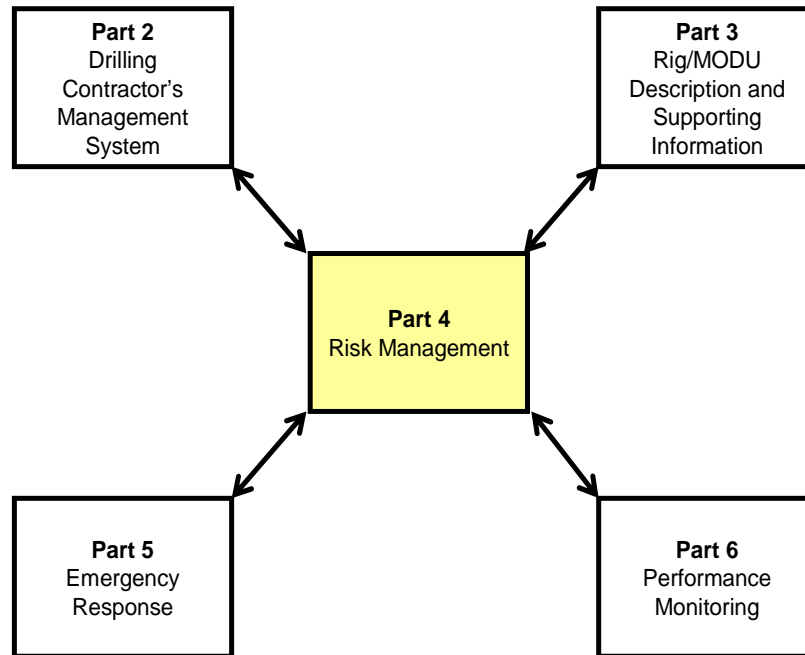


Figure 4.1.1 – HSE Management Assurance

To provide assurance that the Drilling Contractor is managing HSE effectively, Parts 2, 3, 5, and 6 must be applied in conjunction with a structured risk assessment process as described in Part 4.

A consistent approach to assessing and managing risk is required when developing an effective HSE Case. The **Risk Management Process** as described in Part 4 is a recommended approach that will enable Drilling Contractors to consistently apply risk management to effectively integrate HSE management into their operations.

Part 4 of this guideline:

- describes some recommended risk management tools and techniques applicable to MODU's/Rig's and their operations, regardless of location; and
- provides a step-by-step guide to applying a risk management process based on ISO Standard 17776 (Petroleum and Natural Gas Industries - Offshore Production Installations - Guidelines on tools and techniques for hazard identification and risk assessment), that is aligned with various potential stakeholder requirements.

4.1.1 INTEGRATING HSE MANAGEMENT INTO OPERATIONS

Drilling contractors have been managing HSE (Health, Safety and Environment) and operational risks for many years. During the 1990's, many Drilling Contractors recognized that in order to achieve a step-change improvement in safety and operational performance, they would have to formalize their long term experience and work practices within a structured framework represented by a management system. The development of an effective management system was to ensure appropriate risk management efforts would be consistently applied by people at the

worksite to manage **Major Hazards** and **Other Workplace Hazards** to ensure safe and reliable operations. (See Figure 4.1.1.1, Integrating HSE Management into Operations.)

Major hazards and other workplace hazards are defined as;

- **Major Hazards** – Hazards with the potential to result in:
 - a) multiple fatalities or permanent total disabilities;
 - b) extensive damage to structure at installation, MODU/rig or plant;
 - c) massive effect to the environment (e.g., persistent and severe environmental damage that may lead to loss of commercial or recreational use, loss of natural resources over a wide area or severe environmental damage that will require extensive measures to restore beneficial uses of the environment).
- **Other Workplace Hazards** – Hazards with the potential to result in:
 - a) injury or ill health, up to and including single fatalities;
 - b) significant damage to structure or equipment at the installation, MODU/rig or plant;
 - c) limited environmental damage that will persist or require remedial action.

Other Workplace Hazards include all hazards that are not Major Hazards. Typical major hazards for Drilling Contractors can be found in Table 4.1.1.1. This list may not be exhaustive and the Drilling Contractor may need to expand the list depending on the Scope of Operations and the operating area(s).

Typical Drilling Contractor's Major Hazards			
Blowout	Explosion	Fire	
Toxic Release	Loss of Stability	Mooring / Station Keeping Failure	
Towing Incidents	Structural Failure	Dropped Objects	
Major Mechanical Failure	Ship Collision	Helicopter Crash	
Weather / Storms	Events from Adjacent Installations		
Other Possible Major Hazards			
Diving Operations	Seismic Activity	Aircraft Crash	Epidemic / Pandemic

Table 4.1.1.1 – Typical Drilling Contractor's Major Hazards

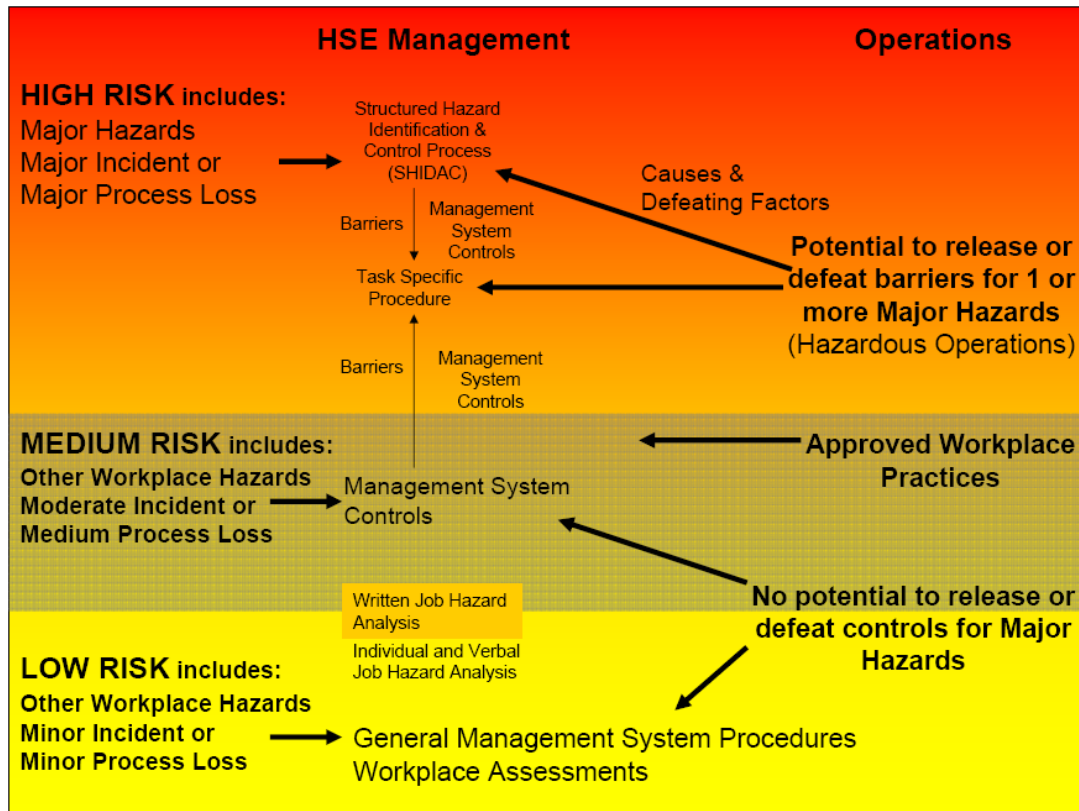


Figure 4.1.1.1, Integrating HSE Management into Operations

In order to further improve the efficiency and effectiveness of business results many Drilling Contractors integrated the management of HSE risks into their remaining business activities.

A management system can be defined as a structured set of interdependent processes (activities), work practices, documents and principles. Such a management system guides people's decision making and is intended to ensure operations of an organization are planned, communicated, implemented and controlled in such a way that the objectives of the organization will be safely achieved. The HSE Case is intended to provide assurance to the Drilling Contractor that the management system effectively provides this guidance.

Note: 'Process' means 'drilling process' or 'business process'; it does not mean 'production process' such as may be performed at a platform with which a MODU/rig may be alongside.

Effective application of the steps of the Risk Management Process described in Part 4 assists the Drilling Contractor in integrating HSE management of risks into operations, regardless of whether the potential consequences result in harm to the health and safety of personnel, harm to the environment, harm to assets or any combination of these.

In addition, the Risk Management Process described in Part 4 has been developed to comply with requirements of:

- International Maritime Organization (IMO) – International Safety Management Code (ISM) and,
- those regulatory regimes that address environment in the same way as health and safety (See Appendix 4).

4.1.2 INTER-RELATION OF HAZARDS AND OPERATIONS

The Drilling Contractor's operations are going to have the potential to release hazards that are common among a number of these operations. (See Figure 4.1.2.1, Relationship of Hazardous Operations and Hazards.)

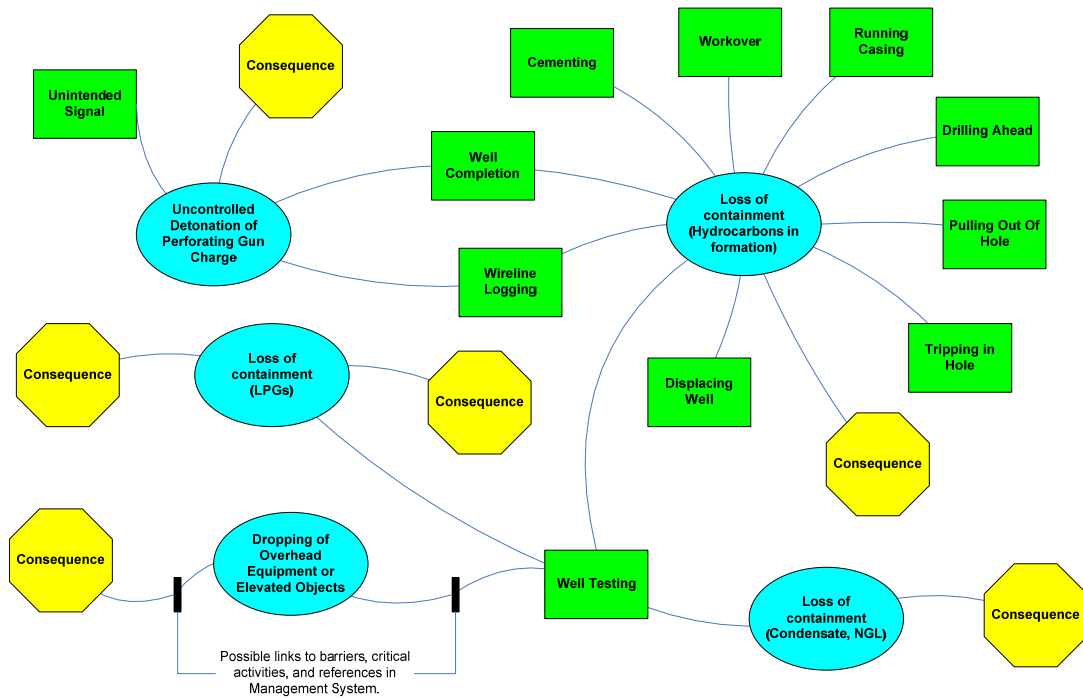


Figure 4.1.2.1, Relationship of Hazardous Operations and Hazards

Identifying the relationship of hazardous operations in the Drilling Contractor's scope of operations assists in applying an integrated approach to managing HSE risks. By understanding the relationships between hazards and critical activities/tasks (via the hazardous operations that may release these hazards), personnel participating in developing an HSE case are better able to effectively evaluate risks.

Some hazardous operations (i.e., tripping pipe) can directly release the hazard. Other hazardous operations (i.e., maintenance tasks) can defeat a barrier for a major hazard if not performed correctly; these types of tasks may or may not put the person performing the task at risk for other workplace hazards. For example, testing and calibration of gas detectors is not typically hazardous to the person performing the task, but if the task is not performed correctly and the equipment does not function

when needed, it could lead to the escalation of a released hazard. See tables 4.1.2.1 and 4.1.2.2 for examples of both types of hazardous operations that may include.

Running casing
Helicopter operations
Supply vessel operations - mooring, unloading, loading
Making heavy lifts over deck
Pulling out of hole (tubulars)
Hotwork in hazardous location
Ballasting
Slip and cut drill line
Well Testing and Flaring

Table 4.1.2.1 – Examples of hazardous operations that can directly release a hazard

Top drive maintenance
Breathing air compressor testing, inspection and maintenance
Radio (GMDSS) testing, inspection and maintenance
BOP inspection and maintenance
Fire and gas system (alarm and panel) testing and maintenance
Accumulator maintenance
Diesel fuel system testing, inspection and maintenance
Emergency generator testing, inspection and maintenance

Table 4.1.2.2 – Examples of hazardous operations that can defeat a barrier for a hazard

4.2 RISK MANAGEMENT PROCESS OVERVIEW

Objective

The HSE Case should demonstrate the effectiveness of the Drilling Contractor's risk management process and how it is applied by people in the workplace to manage HSE risk.

Discussion

The application of a consistent approach is essential to effectively managing risk. A consistent approach applied to all risks reduces the level of normal human error that can be introduced into the process. Although the risk management process described in Part 4 is applicable for operational and business risk, its application as described in this guideline focuses primarily on the management of HSE risk as related to a Drilling Contractor's scope of operations.

Risk management is defined as the coordinated activities to direct and control an organization or activity with regard to risk. Without a consistent approach, the integration of HSE risk management into day to day operations at the workplace can be difficult.

The workforce's collective experience and knowledge of plant, equipment, systems, operations and their interactions, provides added benefit to the risk identification, evaluation and control process.

An appropriate level of resources (e.g., experienced people from the workforce) must be available to identify all HSE hazards and sources of hazards as related to the Drilling Contractor's Scope of Operations. The people participating in the identification of the HSE hazards are required to possess the appropriate competence (in both the Drilling Contractor's Scope of Operations and the risk management process) to ensure a comprehensive approach to the evaluation and treatment of identified risks. This process is intended to ensure people's efforts to manage risk will be proportional to the identified level of potential risk. This approach to risk management ensures that hazards and sources of hazards, and the associated risks are identified and effectively managed.

The risk assessment process in Part 4, when taken in isolation does little if anything to reduce risks. Rather, risks are reduced by employing this process in a participative manner to assure the effectiveness of the HSE Management System.

Risk assessment is an essential part of any HSE Management System, the purpose being to identify and rank risks so that they can be adequately managed. It is part of the process of deciding whether sufficient controls to safely perform work are available or require additional safeguards to provide assurance to stakeholders that HSE and business risks are adequately managed.

The risk assessment approach should be performed in such a way to highlight key assumptions and justify decisions made. The inputs to the risk assessment process should be justified with links to drilling contractor's performance standards and operating environment, such that they can be verified by audit or inspection, as required. The main outputs should be described, including justification that the risks are not intolerable and the list of risks, ranked in order for consideration of risk reduction.

4.2.1 RELATIONSHIP OF RISK MANAGEMENT TERMS - ISO

Table 4.2.1.1, Relationship of Risk Management Terms, adapted from ISO/IEC Guide 73: 2002, describes the relationship of key risk management terms:

Risk Management		
1. Risk Assessment		
a. Risk Analysis		Source (Hazard) Identification
		Risk Estimation
b. Risk Evaluation		
2. Risk Treatment		
a. Risk Avoidance		
b. Risk Optimization		
c. Risk Transfer		
d. Risk Retention		
3. Risk Acceptance		
4. Risk Communication		

Table 4.2.1.1, Relationship of Risk Management Terms - ISO

Organizations may describe the above key risk management concepts in different terms even though the same relationships and definitions will still apply.

4.2.2 RISK MANAGEMENT PROCESS – ISO 17776

Ensuring appropriate competence is available to apply the risk management process is essential in the preparation of an HSE Case. Figure 4.2.2.1, Risk Management Process – ISO 17776, models the essential steps related to the application of an effective risk management process:

1. Identification of the hazards (including sources of hazards and environmental aspects, if applicable),
2. Assessment of risks arising from hazards, and consideration of risk tolerability,
3. Elimination or reduction of the risk.

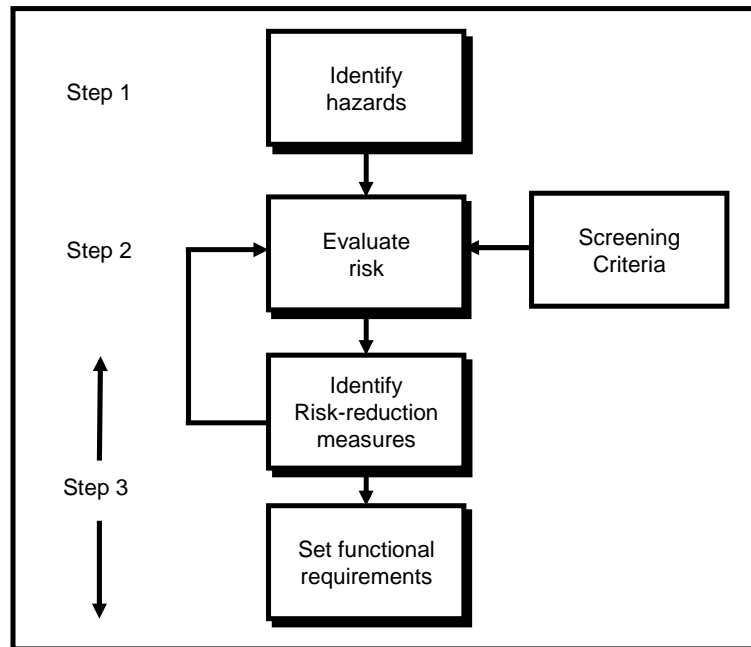


Figure 4.2.2.1, Risk Management Process – ISO 17776

There are internal and external business aspects a Drilling Contractor must consider when applying a risk management process. These specific business aspects take into account differences in geographical location, the suitability of the MODU/rig for the operating environment, the client(s) and third parties under their control, the regulatory environment, and the supplier / sub-contractor support infrastructure (onshore/offshore) available.

Effective application of a risk management process requires sound judgments and appropriate decisions to be made, such as: identifying appropriate screening criteria; defining effective and achievable risk management barriers; and determining when risk levels are tolerable.

It is necessary to verify that the people participating in the risk management process have sufficient understanding with these internal and external business aspects, as well as HSE management and risk management processes.

4.2.3 STRUCTURED HAZARD IDENTIFICATION AND CONTROL (SHICAC) PROCESS

The Risk Management Process recommended to be applied in the development of an HSE Case is named: Structured Hazard Identification and Control (SHIDAC) Process.

SHIDAC is based on Figure 4.2.2.1, Risk Management Process – ISO 17776, but with additional sub-steps included to provide a more appropriate description of the practical requirements for Drilling Contractors for each of the three key risk management steps:

1. Identify Hazards
2. Evaluate Risk
3. Identify Risk Reduction Measures (control, defence, and recovery measures) and Set Functional (Performance) Requirements

SHIDAC is a process incorporating the basics of fault-tree and event-tree analyses, and includes implementation of measures to control major and other workplace hazards and to recover in the event of a hazard release. A key deliverable of this process is the determination of major hazards, other workplace hazards, and the critical activities/tasks to implement, monitor and maintain barriers related to a Drilling Contractor's scope of operations.

The SHIDAC process is an iterative process, potentially requiring multiple passes of each step to effectively complete the risk management process related to specific hazards. Drilling contractors may find it appropriate to use a "Bow-Tie" diagram to assist them in identifying the various causes and consequences of a particular hazard scenario. Such diagrams also simplify the identification of control, defence and recovery barriers. Reference numbers can be assigned to each barrier to facilitate capturing which barriers are common to several causes for a particular scenario and those which are common to several scenarios. A typical "Bow-Tie" diagram (ISO 17776) is shown in figure 4.2.2.2. Bowtie diagrams can:

- Identify and document the "lines of defence" or "HSE barriers" which are in place;
- Facilitate a qualitative assessment of any gaps;
- Help inform an assessment of event likelihood.

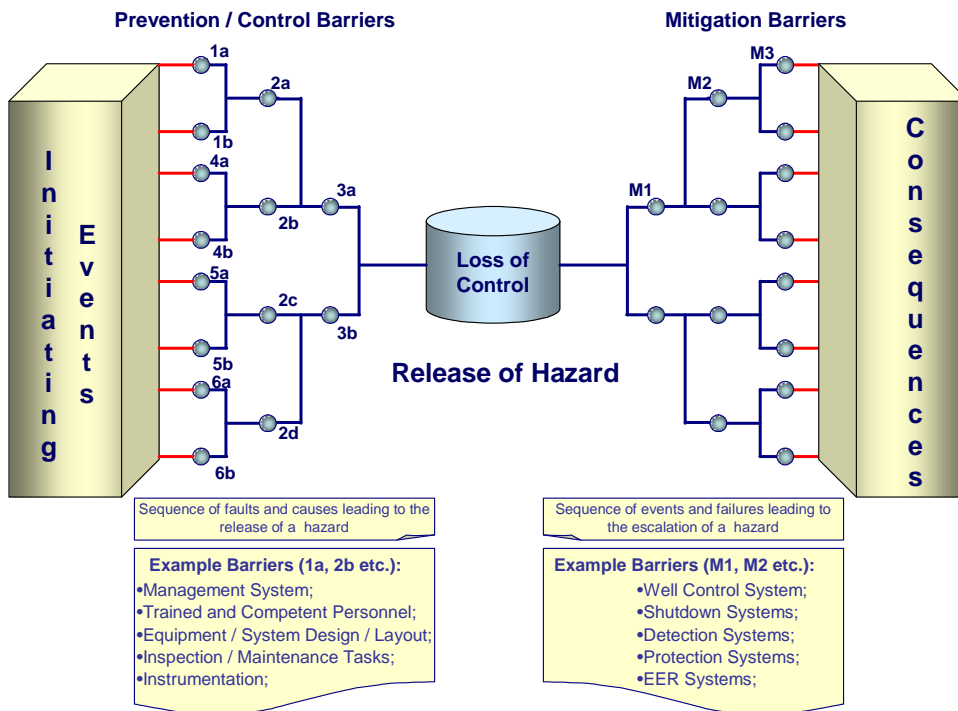


Figure 4.2.2.2, Diagrammatic Representation of an example Hazard Scenario (ISO 1776)

4.3 STRUCTURED HAZARD IDENTIFICATION AND CONTROL (SHIDAC) PROCESS STEPS

4.3.1 SHIDAC STEP 1 – IDENTIFY HAZARDS *(See also Part 4.4 of this document)*

- A. Select team members with the appropriate competency to participate in the process.
- Team members with the appropriate operational and business competence. *(Workforce involvement)*.
 - Team members with the appropriate risk management process competence. *(Specialist involvement)*.
- B. Define the scope for applying SHIDAC (e.g., what location / installation is involved, suitability of equipment, what operations are involved, what interfaces will be included, etc.)
- C. Identify the major and other workplace hazards related to the Drilling Contractor's scope of operations and their potential consequences.
- Drilling contractor to include all identified potential major and other workplace hazards in the Drilling Contractor's Hazard Register. (See Table 4.4.1.)
- D. Identify the **sources of hazards**, as related to the location or specific operation, which can release or introduce one or more major hazards or other workplace hazards. Sources can be hazardous operations (e.g., simultaneous/combined operations), necessary equipment, necessary materials, environmental conditions, etc.
- For each hazard in the Drilling Contractor's Hazard Register, include all of the identified sources of hazards. (See Table 4.4.1.)
- E. Identify which specific parts (causes) of the operation can release each hazard (e.g., incorrect mud weight can release the hazard of "Hydrocarbons in the formation").

4.3.2 SHIDAC STEP 2 – EVALUATE RISK *(See also Parts 4.5 and 4.6)*

- A. Apply appropriate competency to evaluate and estimate the risk of all the identified hazards (both major and other workplace hazards) included in the Drilling Contractor's Hazard Register. Determine the potential consequences (severity) of the release of the hazards by applying credible scenarios (including those causes identified in SHIDAC Step 1E). Determine the probability (likelihood) of the total scenario (not just the probability of the consequences if the hazard is released).
- Drilling contractor to determine which operations are **hazardous operations** based on the potential to release one or more **major hazards**. This can be recorded in the Drilling Contractor's Hazard Register. (See Table 4.4.1.)

- B. Drilling contractor to apply risk assessment matrix (RAM) to rank risks into categories (High, Medium, or Low Risk), to ensure people's efforts to manage risk will be proportional to the anticipated level of potential risk. **Screening criteria** developed by the Drilling Contractor is represented in the RAM to judge the tolerability of an identified hazard and consequence. (See also Part 4.5.2, Screening Criteria of this Chapter.)

4.3.3 SHIDAC STEP 3 – IDENTIFY RISK REDUCTION MEASURES AND SET FUNCTIONAL/PERFORMANCE) REQUIREMENTS (See also Part 4.7).

- A. For other workplace hazards that have been assessed to be **low risk**, and have potential consequences resulting in a **minor incident**, apply risk reducing controls available within the general workplace practices and procedures, represented in the Drilling Contractor's management system. In addition, people in the workplace should apply their experience and judgment to manage risk by applying the applicable individual, verbal, or written job hazard analysis.
- B. For other workplace hazards that have been assessed to be **medium risk**, and have potential consequences resulting in a **moderate incident** conduct a hazard analysis onsite at the workplace based on people's experience and judgment by applying barriers or controls contained within the general procedures of the Drilling Contractor's management system to prevent the release of hazards and to mitigate and recover from the consequences. Additional specific controls identified in documented job hazards analyses and workplace hazard assessments should be included.
- C. For **major hazards** that represent **high risk**, and other workplace hazards that have been assessed to be high risk, the risk treatment to be applied includes the following steps:
- For each cause (potential to release hazards), identify the barriers expected to prevent the release of the hazard.
 - For every potential release of a hazard, identify the barriers to reduce the consequences, or assist in the recovery from the consequences.
 - For each barrier identified:
 - identify the **critical task / activities** required to ensure barriers are in-place, working effectively and their integrity is maintained
 - identify the resources and competencies required for the barrier to be implemented and effective,
 - identify where the barrier is referenced in the Drilling Contractor's management system, and
 - identify any factors that prevent such barriers from being defeated, removed from service or any reduction or elimination of their effectiveness. Identify any compensatory barriers and the associated activities, resources, competencies, and Drilling Contractor's management system references to address such barrier defeating factors.
 - Drilling contractor to summarize the factors that defeat a barrier, either singly or in combination, which results in the potential to exceed the Drilling Contractor's tolerability limits of safe operations. This summary of defeating factors will allow the Drilling Contractor to establish the

Summary of Operation Boundaries (SOOB) for the location. (See also Part 4.7.3, Summary of Operational Boundaries).

4.4 IDENTIFICATION OF HAZARDS AND SOURCES OF HAZARDS

Objective

To identify and describe all the HSE Hazards and Sources of Hazards associated with a MODU/rig and its operations.

Discussion

The first step in managing the risks associated with a Drilling Contractor's Scope of Operations is to systematically identify all the Hazards and Sources that may affect, or arise from, the operations the MODU/rig undertakes.

In these guidelines, a Hazard is defined as an intrinsic property of anything with the potential to cause harm. Harm includes ill-health and injury, damage to property, plant, products or the environment, process losses, or increased liabilities. (Note that this definition of Hazard is more specific than some other common uses of the word such as 'danger', 'chance' or even 'risk'.)

A Hazard Source is defined as:

- anything with the potential to release a hazard, or
- a condition that can defeat a barrier leading to an increase in the realisation of a hazard being released. (Barriers are explained in detail later.)

Hazardous sources can be operations (e.g., running casing), simultaneous/combined operations, (e.g. running casing while offloading supply vessel), necessary equipment (e.g., pressure vessel, energized (live) electrical panel, etc.), necessary materials (e.g., hazardous chemicals), environmental aspects and conditions, as well as acute and chronic health aspects and conditions, etc.

Each Drilling Contractor's organization must identify the hazardous sources for major and other workplace hazards as relate to their scope of operations.

The identified hazards to health, safety and environment and their sources should be entered into the Drilling Contractor's Hazard Register. A Hazard Register is a brief, but complete, summary that demonstrates that hazards have been identified and assessed and that barriers (both controls and defences) are in place. The Drilling Contractor should only include references to the Drilling Contractor's management system for each barrier, not the full details of each barrier.

(1) <i>Hazard</i>	(2) <i>Sources</i>	(3) <i>Consequences</i>	(4) <i>MH</i> (Y/N)	(5) <i>OWH</i> (Y/N)	(6) <i>Risk Rank</i> <i>P/E/A/R</i>	(7) <i>Control Barriers</i> (MS Reference)	(8) <i>Defence Barriers</i> (MS Reference)
Hazard 1	Source 1.1	Consequence 1.1	Y	N	3D / 1A / 1A / 3A	Control 1.1	Defence 1.1
	Source 1.2	Consequence 1.2				Control 1.2	Defence 1.2
	Source 1.3	Consequence 1.3				Control 1.3	Defence 1.3
		Consequence 1.4					Defence 1.4
Hazard 2	Source 2.1	Consequence 2.1	N	Y	3A / 3E / 2B / 2B	Control 2.1	Defence 2.1
	Source 2.2	Consequence 2.2				Control 2.2	Defence 2.2
	Source 2.3	Consequence 2.3				Control 2.3	Defence 2.3
	Source 2.4					Control 2.4	

Table 4.4.1 - Example Drilling Contractor's Hazard Register

See also Figure 4.5.1.1

P People

A Asset

E Environment

R Reputation

MS Management System

MH Major Hazard

OWH Other Workplace Hazard

4.4.1 ACUTE AND CHRONIC HAZARDS

Due to the integrated approach to managing HSE risks, it is necessary to identify and take into consideration two distinct types of hazards - acute and chronic.

- Acute hazards are those with the potential to cause impairment (harm) and or fatalities as a result of more or less instantaneous events or incidents.
- Chronic hazards are those with the potential to cause harm arising from non-instantaneous exposures such as repeated emissions or discharges, continuous emissions or discharges, and/or occupational exposures.

In order to estimate the level of harm from such hazards, it is necessary to provide a means by which such exposures are quantified in terms of the intensity, duration of

exposure and consequences of effect. Two basic criteria must feature in the determination process, namely:

- The threshold of harm above which protection is required to prevent impairment of their physical and biological functions an individual requires for escape or to avoid becoming a fatality (i.e. survivability) *and*
- A means for the estimation of fatality probability should dose levels exceed the harm threshold and adequate protection is not present.

The concept that chronic hazards are often known and accepted or normalized into the operation is central to environmental and occupational health assessments. Control of chronic hazards is often achieved by setting exposure limits (in case of health hazards) or discharge/emission limits (in case of environmental aspects). Exceeding these limits can be treated as the release of the hazard (aspect), similar to the treatment of the release of acute hazards.

4.4.2 ENVIRONMENTAL ASPECTS AND OCCUPATIONAL HEALTH HAZARDS

When the Drilling Contractor includes environment and health into their HSE Case, the same process applied to safety hazards should be applied to environmental aspects and to health hazards. Environmental aspects are hazards as per the ISO definition. In such cases the Drilling Contractor's Hazard Register should also include health hazards and environmental aspects, where included in the HSE Case, to provide a composite overview of the hazards to persons on the MODU / rig and also to the environment. Thereby providing each Drilling Contractor with a complete overview of risk causation, hazard effect, control and defence barriers in place and actions required. See Table 4.4.2.1 for some common environmental activity and aspects categories. See Table 4.4.2.2 for an overview Occupation Health related hazards and Table 4.4.2.3 for some common Occupational Health risk reduction methods.

Activities	Aspects
Energy Usage	Raw Material Usage
Water Usage	Packaging
Material Usage	Product Usage
Material Storage	Disposal
Emissions (air, water, waste, heat)	Energy Usage

Table 4.4.2.1 – Common Environmental Activity and Aspect Categories

How can this be achieved?

- By incorporating Occupational Health and Environmental hazards into the Drilling Contractor's Hazard Register to ensure all hazards and sources are addressed in the HSE Case;
- By systematically identifying if, where and when each possible hazard is encountered on the MODU/rig (e.g., area layout, fixed equipment, etc.) and during which operations;

Risks can be related to the circumstances present in an area or related to a certain activity; applying both of these approaches provides a complete hazard overview.

- By systematically identifying credible sources that could release each identified hazard; the sources can be identified in the following groups:
 - Sources creating exposures related to systems (e.g., Mud systems, electrical installations, flaring system, etc.)
 - Equipment creating exposures (e.g. Iron roughneck, airpowered tools, etc.)
 - Chemicals and substances creating exposures (e.g., burns or fumes, etc)
- By identifying the credible consequences that could result if control of the hazard was lost (i.e., if the hazard was released);
- By identifying the measures of control of each of the Hazards.

What should be (referenced) in the HSE Case?

1. The identification method used to make the inventory of Hazards
2. Listings of hazards, equipment, areas, chemicals and substances, responsibilities, tasks and measures of control to limit the exposure from such hazards.
3. Through a baseline survey exposure levels, as appropriate should be assessed against a relevant standard to determine if they are tolerable and safe.
4. Identification of Company exposure level standards.
5. How and at what exposure level, actions are taken, where improvement is necessary.

The following is a set of typical examples of exposures to hazards which can occur from equipment and systems, with an indicative rating representing an action level.

This list may not be exhaustive and the Drilling Contractor may need to vary the list depending on their Scope of Operations and the operating area(s).

OCCUPATIONAL HEALTH RELATED HAZARDS	
Noise	Vibration
Abrasive Wheels / Grinders	Electro-Magnetic Radiation
Ionising Radiation	Thermal Radiation
Chemical Vapours	Chemical Particles
Chemical Gases	Ergonomics
High Surface Temperature (<i>equipment</i>)	Low Surface Temperature (<i>equipment</i>)
Transport Safety (<i>portable equipment</i>)	Structural Safety (Hit by - Caught by - Cut by)
Stress	

Table 4.4.2.2 – Overview of Occupational Health related Hazards

For those exposures identified as unacceptable, the method of mitigation should be identified.

Drilling Contractors may find it appropriate to identify and document a specific item(s) of PPE for each level of hazard exposure.

Elimination	Eliminate the risk (i.e., engineer out)
Substitution	Substitute method and materials to reduce the risk
Modification	Modify methods and materials to reduce the risk
Containment	Contain materials to reduce the risk
Isolation	Isolate people from processes and materials to reduce risk
Procedures	Implement and monitor performance standards.
Training	Increase people's skill and abilities to reduce the risk
Personal Protective Equipment (PPE)	Protect people from health hazards to reduce risk

Table 4.4.2.3 – Common HSE Risk Reduction Hierarchy

ISO 14001 is the standard developed by the International Organization for Standardization (ISO) for environmental management systems. OHSAS 18001 is an occupational safety and health management system standard. OHSAS 18001 is structured similar to ISO 14001. It was specifically developed to be compatible with ISO 14001 and ISO 29001.

4.4.3 HAZARD AND SOURCE IDENTIFICATION TECHNIQUES

For each Hazard, the reasonable, worst-case potential consequences, or effects of that hazard being realized, are also identified at this time. This is to determine the hazard's relative degree of significance. The objective is to systematically identify the most severe but credible consequence to people (P), assets (A), the environment (E) or company reputation (R) that could result from each Hazard (or Source). Only a reasonable estimate of what could happen if control of the hazard was lost is required. Therefore the experience and judgment of the people assigned to participate in this identification step is very important.

There are many review techniques that can be used to help identify hazards, sources and consequences. Some of these can be applied to focus on individual Health, Safety or Environmental Aspects. Some of the more common review techniques for Hazard and Source information are listed below - Drilling Contractors should choose those that are appropriate for their organization and management systems.

Relevant legislation/regulatory documents	Existing environmental management practices and procedures
Incident, Audit and Inspection reports	Environmental discharge and emission records
Hazard identification (HAZID)	'What-If?'
Preliminary hazard analysis (PHA)	Gross Hazard Assessment (GHA)
Job hazard analysis (JHA) – Individual, Verbal, and Written	Task Risk Assessment (TRA)
Fault tree analysis (FTA)	Event tree analysis (ETA)
Hazard and operability analysis (HAZOP)	Driller's Hazard and Operability Study (HAZOP)
Health risk assessment (HRA)	Environmental impact assessment (EIA)
Failure modes and effects analysis (FMEA)	Failure modes and effects criticality analysis (FMECA)
Failure modes and impacts criticality analysis (FMICA)	Hardware in loop (HIL) simulation
Emergency response plan scenarios	Quantitative Risk Assessment (QRA)
Cost Benefit Analysis (CBA)	Physical-effects modelling (PEM)
Fire and Explosion Studies	Emergency Escape and Rescue Analysis (EERA)
Hazard Analysis (HAZAN)	

Table 4.4.3.1, Hazard and Source Identification Techniques

Information on the identified Hazards and the potential consequences associated with each is recorded in the Drilling Contractor's Hazard Register which will continue to be developed and forms an important part of the HSE Case. (See Table 4.4.1.)

How can this be achieved?

- By developing a Drilling Contractor's Hazard Register to ensure all hazards and sources (including Environmental Aspects and Health Hazards, when applicable) are addressed in the HSE Case;
- By systematically identifying if, where and when each possible hazard is encountered on the MODU/rig (e.g., area layout, fixed equipment, etc.) and during which operations;
- By systematically identifying credible sources that could release each identified hazard;
- By systematically identifying the credible consequences that could result if control of the hazard was lost (i.e., if the hazard was released);
- By recording the above information in the Drilling Contractor's Hazard Register.

What should be (referenced) in the HSE Case?

1. A description of the hazard identification process that has been applied.
2. A list of the team members involved in the process with descriptions of their knowledge, competence, and understanding of the Drilling Contractor's management system.
3. The Drilling Contractor's Hazard Register showing that all relevant hazards have been addressed.

4.5 RISK ESTIMATION

Objective

To determine HSE risk levels by assigning values to the severity of each potential consequence and to the probability of the consequence occurring.

Discussion

Risk Analysis is the combined activities of Hazard Identification and Risk Estimation. Once the hazards and sources have been identified, the risk associated with the identified hazard needs to be estimated.

An important activity in risk management is the process of ranking the identified hazards with respect to their significance to the business and operation. The ranking of risks is based on the level of HSE risk associated with those hazards included in a MODU's/rig's scope of operations. Risk Estimation is the step of systematically determining the level of risk that each of the identified hazards presents to people, assets, the environment or any other area of concern such as company reputation.

4.5.1 THE RISK ASSESSMENT MATRIX

In order to provide a consistent and systematic estimation of risk, the recommended approach is to apply a Risk Assessment Matrix (RAM) in a qualitative manner. A RAM provides a convenient structure to apply the Drilling Contractor's screening criteria (values, targets or performance standards) to evaluate or compare the significance of an identified hazard, event or associated risk to determine the tolerability.

Risk is defined as the combination of the probability of occurrence of a consequence (including the probability of the release of the hazard) and the severity of that consequence. Therefore a matrix has been developed with consequence severity on the Y-axis and probability of occurrence on the X-axis. The level of risk can then be determined qualitatively at the intersection of the relevant row and column for a given scenario. Examples of how to use the RAM are provided after Figure 4.5.1.1.

These Guidelines do not prescribe using a particular matrix. Also, different Drilling Contractor organizations may have different matrices. However, when applied effectively for risk estimation, the RAM is fundamental to the risk management process described in these guidelines.

The example RAM shown in Figure 4.5.1.1 below is derived from the matrix described in ISO standard 17776. This example RAM is also referred to for several risk management purposes throughout these Guidelines and is equally applicable to health, safety, environment, and business risk assessments. Note that the example RAM is shown with a gradient across the risk levels. In practice, there are divisions between the risk levels so that each cell contains only one risk level (high, medium, or low). These divisions are to be determined by the Drilling Contractor.

Severity rating	Consequence				Increasing Probability				
	People	Environment	Assets	Reputation	A Never occurred in Industry	B Has occurred in Industry	C Has occurred in Company	D Multiple occurrence per year in Company	E Multiple occurrence per year at Location
0	zero harm	zero effect	zero damage	zero impact	Low Risk Manage for continued improvement				
1	slight harm	slight effect	slight damage	slight impact					
2	minor harm	minor effect	minor damage	limited impact	Medium Risk Incorporate risk-reducing measures			High Risk Fail to meet screening criteria	
3	major harm	local effect	local damage	considerable impact					
4	single fatality	major effect	major damage	national impact					
5	multiple fatalities	massive effect	extensive damage	international impact					

Figure 4.5.1.1, Typical Risk Assessment Matrix Example (ISO 17776)

The RAM links potential consequence severity with probability of occurrence to determine a qualitative assessment of risk.

The RAM is systematically applied per the following:

- For each identified hazard, first determine the most severe but realistic and credible potential consequence that may harm each of:
 - People (P)
 - Environment (E)
 - Assets (A) and
 - Reputation (R).
- Assign each of these potential consequences a Severity Rating from 0 to 5 based on the descriptions and guidance for each level (as determined by the Drilling Contractor). Absolute precision is not important but being consistent is because these estimates will only be used to rank the risks against each other.
- For each potential consequence to P, E, A, and R, estimate the associated probability, or the likelihood, of the most severe consequence. The probability estimated is not just the probability of the release of the hazard. The probability estimated is the combination of the probability of the release of the hazard and the probability of that particular consequence occurring.

4. For each potential consequence, follow the row for that severity rating (as determined in step 2 above) from the left hand side of the RAM, across to the right hand side of the RAM to the column representing the estimated probability level (as determined in step 3 above).
5. The cell where the row and column intersect provides a qualitative estimation of the level of risk (high, medium or low) for that hazard to each of P, E, A, and R.
6. These estimates are relative, therefore to finish the Risk Estimation, assign the single highest risk rating that was determined for P, E, A, or R to the hazard you are analyzing.

For example:

- 3C(P) - potential major harm that has occurred within the Drilling Contractor's organization in the past under similar circumstances (to people);
 - 3D(E) - potential local effect to the environment that occurs several times a year within the Drilling Contractors organization, under similar circumstances;
 - 2E(A) - potential minor equipment damage that does occur several times per year due to similar circumstances (to assets).
7. The Potential Risk Rating for each Hazard is then included in the Drilling Contractor's Hazard Register.

It is worth noting that risk to reputation is often a difficult area to evaluate since it is usually driven by perceptions. It may well be that risk can be "proven" in scientific terms to satisfy tolerability criteria for HSE management and yet the risk to the company's image or reputation may still be high due to societal perceptions, particularly in exceptionally sensitive locations.

4.5.2 SCREENING CRITERIA

Screening Criteria are defined as values, targets or performance standards used to evaluate or compare the significance of an identified hazard, event or associated risk to determine the tolerability. They may be defined either in quantitative or qualitative terms. Screening Criteria includes (but is not limited to):

- legislation/regulatory requirements,
- industry standards,
- client contractual requirements, and
- internal company requirements (based on company values and experience).

One primary application of screening criteria is in the RAM to define consequence severities. In the example RAM, a few of the severity classifications have values, targets or performance standards associated with them (e.g., single fatality and national impact) however most do not. It is necessary to determine reasonable quantitative and/or qualitative parameters that define each severity level. This will assist in applying a consistent approach to assessing potential risk using standard screening criteria.

Screening Criteria are used throughout the risk management process.

How can this be achieved?

- By following a systematic process to estimate potential risk for each identified hazard in the Hazard Register.

What should be (referenced) in the HSE Case?

- The revised Drilling Contractor's Hazard Register that includes:
 - an estimate of a realistic potential consequence severity and its probability of occurrence for each hazard as it could affect People, Assets, Environment, and Reputation.
 - one overall risk rating assigned to each hazard.

4.6 RISK EVALUATION

Objective

To compare the estimated risk for each hazard and source versus the Drilling Contractor's screening criteria to determine the significance of each risk.

To identify the major and significant hazards and sources in order to facilitate a more detailed risk assessment of these hazards and sources.

Discussion

According to the definitions, Risk Assessment is the combined activities of Risk Evaluation and Risk Analysis. (Risk Analysis is covered in section 4.4 – Hazard Identification and 4.5 – Risk Estimation.)

Up to this point, the Drilling Contractor has systematically identified the hazards and sources that could cause harm on a MODU/rig and analyzed these to qualitatively understand the level of risk that each presents. With this knowledge, the Drilling Contractor can assess the significance of these risks (and therefore of the hazards) to the business by evaluating the estimated risks versus Screening Criteria. The Drilling Contractor needs to have established Screening Criteria that can be used as benchmarks to determine Tolerability of Risk. This is explained in further detail below followed by recommended guidance on how it is to be applied in the HSE Case.

4.6.1 TOLERABILITY OF RISK

Tolerability means a willingness to operate with some risk in order to secure certain benefits and in the confidence that the risk is being properly controlled. Tolerability of Risk refers to a framework that helps individuals to decide if risks are Broadly Acceptable, Tolerable or Intolerable.

Tolerable risk is not the same as acceptable risk. It instead refers to an organization's, a regulator's, or a society's willingness to live with a risk in order to gain the benefits from the activity, with the understanding that the risk is being

properly managed and with the belief that the risk is worth taking. It does not mean that tolerable risks will be acceptable to everyone.

What may be tolerable to any one stakeholder (e.g., organization, regulator or society) at any given time may not be tolerable to another or at another time. Tolerability of Risk is a concept used to decide what, when and how to go about activities which may create exposure to inherent risks. Setting tolerability screening criteria involves aligning different stakeholder approaches to the practicability of possible risk management solutions. However, any risk identified as intolerable must be reduced until tolerable to the drilling contractor, before considering additional reduction to ensure that risks are controlled in compliance with legislation / regulations.

Typically, professional judgment and experience are used to assess whether qualitative findings are Broadly Acceptable, Tolerable or Intolerable. However, in some cases, Tolerability Criteria in legislation/regulations may be quantified.

Risks are often considered Tolerable when:

- a) the Drilling Contractor is willing to accept the risk in order to gain the benefits from the activity (with the understanding that the risk is being properly managed and with the belief that the risk is worth taking);

AND

- b) the subject risk has been reduced to a level where the effort, cost and practicality of further reduction measures become disproportionate to the additional amount of risk reduction that could be gained. This condition is sometimes referred to as “As Low As Reasonably Practicable” (ALARP).

Drilling Contractor’s operations should not proceed with Intolerable risk - when the level of risk is still considered too great to proceed, even with all reasonable risk reduction measures in place.

There are detailed cost benefit analysis techniques that can be applied in determining if risks are tolerable. However, for a normal MODU/rig, qualitative assessments based on the Drilling Contractor’s sound operational and engineering judgment, recognized codes, standards, industry practices, etc. are generally adequate justifications that risks are tolerable. If quantified assessments such as QRA results exist then these can also be used.

It is worth noting that different stakeholders may have different perceptions of what is tolerable and this difference of opinion may be especially evident in how the risk to reputation is assessed and treated.

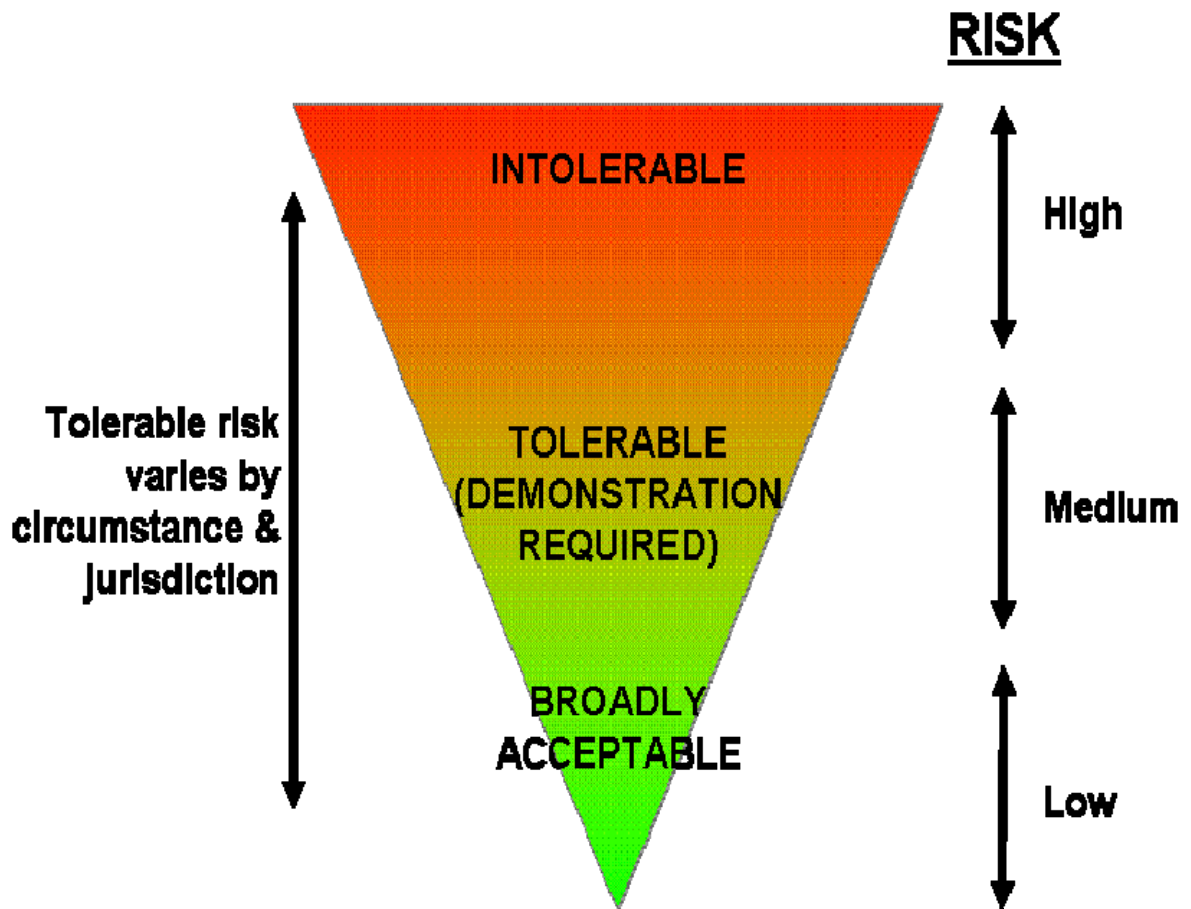


Figure 4.6.1.1, Tolerability of Risk

Severity rating	Consequence				Increasing Probability				
	People	Environment	Assets	Reputation	A	B	C	D	E
					Never occurred in Industry	Has occurred in Industry	Has occurred in Company	Multiple occurrence per year in Company	Multiple occurrence per year at Location
0	zero harm	zero effect	zero damage	zero impact					
1	slight harm	slight effect	slight damage	slight impact					
2	minor harm	minor effect	minor damage	limited impact					
3	major harm	local effect	local damage	considerable impact					
4	single fatality	major effect	major damage	national impact					
5	multiple fatalities	massive effect	extensive damage	international impact					

Figure 4.6.1.2, Example of Tolerable Region of the RAM

4.6.2 SCREENING CRITERIA AND SIGNIFICANCE

Screening Criteria have an important role in the determination of the tolerability of risk. Drilling companies, clients, regulators and other stakeholders will not always have the same perception as to when risks are at a tolerable level. Screening Criteria can help to clarify these differences as well as help resolve how to manage them. Figure 4.6.2.1 outlines how screening criteria are related to performance standards and tolerability. There are instances when regulators and clients specify performance standards which may be in addition to those deemed applicable by a Drilling Contractor. In other instances, Drilling Contractor's performance standards may be above those of clients and regulators. Figure 4.6.2.1 Relationship of Screening Criteria with Risk Reduction and Tolerability represents each Company's efforts to apply their performance standards to operate at or above their tolerability.

Screening criteria and tolerability will be discussed further in the Risk Treatment section; however, they are essential to consider during Risk Assessment because they provide an indication of the significance of the hazards and risks to the business.



Figure 4.6.2.1, Relationship of Screening Criteria with Risk Reduction and Tolerability

Often quantified screening criteria have not yet been developed and there is no single quantity or measure that can be used to prioritize management efforts to evaluate risk. As a result, it is common to use a qualitative test of 'significance' as a basis for prioritization. For example, within the ISO 14001 Environmental Management Standard, 'significance' is a key criterion for any environmental aspect which has been identified.

Significance may be assigned only when required by environmental legislation/regulations. However, particularly for operations in areas where there are environmental or health sensitivities or specific public concerns, a more comprehensive approach to significance may be applied.

Significance can often be assessed through a series of “yes/no” tests. On this basis, a reasonably sophisticated example set of significance tests may be as shown in the Table 4.6.2.1.

Hazard or Environmental/Health Aspect Category	Test of Significance
Regulatory Requirement	Any hazard or environmental aspect which is subject to regulatory control or authorization will be considered to be a ‘significant’ aspect.
Corporate Policy & Objectives	The Drilling Contractor has set various policy objectives with regard to HSE management. Any hazard or environmental aspect that has direct relevance to these objectives shall be considered ‘significant’
Chronic Environmental Exposure	Any chronic environmental aspect which is assessed as having a consequence rating of 4 or more on the RAM shall be considered to be ‘significant’
Potential injury or Health impact to people	Any hazard or aspect with potential to cause injury or illness which is assessed as having a consequence rating of 3 or more on the RAM shall be considered to be ‘significant’
Stakeholder Concern	The Drilling Contractor & operator interact with external stakeholders (e.g., government or special interest groups). Any issue raised by such groups which has a consequence rating of 4 or more shall be considered ‘significant’

Table 4.6.2.1, Example Significance Tests

4.6.3 INTER-RELATION OF MAJOR HAZARDS AND EVENTS (e.g. *Domino principle*)

The release of a major hazard rarely results in a single isolated event. Incidents generally consist of a chain of inter-related events (e.g., a load dropped from a crane ruptures fuel tanks that in turn catch fire, etc.) The risk evaluation requires considering the inter-relation of hazards and events by assessing the consequences of releasing one or more major hazards which potentially could escalate. Understanding the inter-relation of major hazards and associated escalating events is necessary to ensure accurate evaluation of potential consequences and risk. Be aware that not all major hazards will inter-relate with other hazards. For example, an epidemic aboard a MODU/rig will only affect the personnel and is unlikely to directly lead to a hazard involving the structure and equipment.

The inter-relation of major hazards is represented in the graphical example Figure 4.6.3.1, Inter-relation of Major Hazards and Events Example.

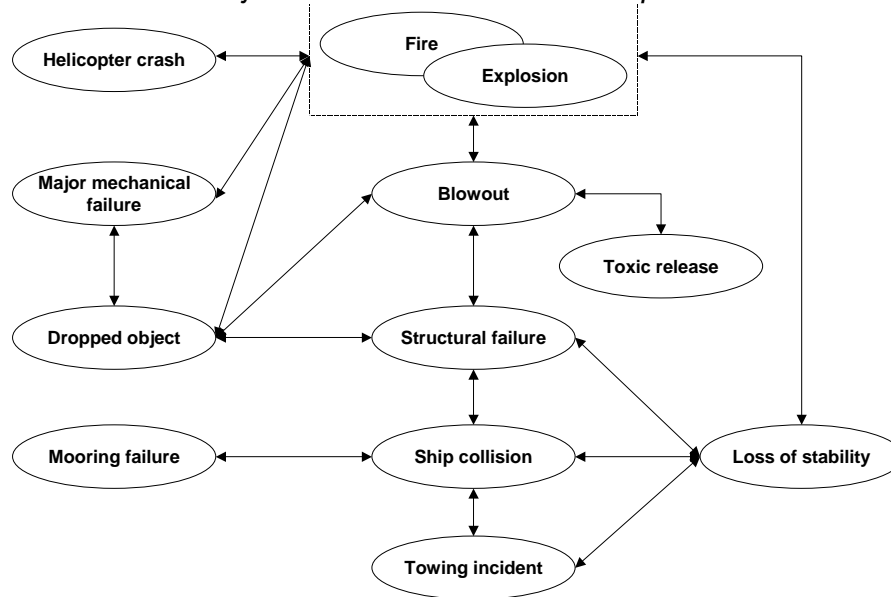


Figure 4.6.3.1, Example of Inter-relation of Major Hazards and Events

How can this be achieved?

- By developing screening criteria that help to define: Intolerable risk, Major Hazards, and the significance of hazards and environmental aspects (sources) associated with the MODU/rig;
- By considering how each release of a hazard could escalate to create other hazard releases;
- By ranking the hazards and sources that are listed in the Drilling Contractor's Hazard Register:
 - according to their relative risk rating as determined using the RAM (e.g., high, medium or low),
 - according to their significance as determined by a test of significance (e.g., severity 4 potential consequence), and
 - if quantitative risk assessments are available at this time, according to their degree of tolerability based on quantified specifications.

What should be (referenced) in the HSE Case?

- A description of the Screening Criteria used to evaluate the risks associated with each of the identified hazards and their sources;
- The revised Drilling Contractor's Hazard Register including the HSE risk ranking for each identified hazard and source;
- Details of how the inter-relation of major hazards and sources has been considered including a drawing or description of how the relevant hazards and sources are inter-related;
- The major and other workplace hazards should be clearly identified in the Drilling Contractor's Hazard Register to facilitate more rigorous analysis for risk treatment in the subsequent steps of this process.

4.7 RISK TREATMENT

Objective

To determine and record the response(s) to each identified hazard and source that will reduce the associated HSE Risk to a tolerable level for the MODU/rig and its activities.

Discussion

Risk Treatment is the part of the Risk Management Process where all the previous identification and assessment work is used to determine effective barriers that will ultimately result in a level of risk tolerable to the Drilling Contractor.

The following definitions are applied in this section:

Risk Treatment - the process of selection and implementation of measures to modify risk. Risk Treatment includes the following:

Risk Avoidance – a decision to not become involved in, or action to withdraw from, a risk situation.

Risk Optimization – a process to minimize the negative and to maximize the positive consequences and their respective probabilities of occurrence.

Risk Transfer – sharing with another party the burden of loss or the benefit of gain, from a risk, and the measures to reduce the risk.

Risk Retention – the acceptance of the burden of loss, or benefit of gain, from a risk.

Beginning from a high level overview of the Drilling Contractor's HSE risks, those with higher significance to the operation receive more rigorous treatment. For all hazards the intention should be to reduce all risks to levels tolerable to the Drilling Contractor.

These Guidelines focus on the Risk Optimization strategy described above since it is the most applicable for an HSE Case, but it is worthwhile to highlight the other three strategies which may also be applied. Often a risk response will combine two or more of these strategies to achieve the desired results. For example, avoidance or transfer strategies can be combined with optimization strategies. Also, risks can be rarely reduced to zero therefore some **Risk Retention** is usually necessary. The risk that is retained after the selected risk reduction measures have been applied is referred to as residual or net risk. It is this residual risk that Drilling Contractors aim to reduce to a tolerable level and to maintain at a tolerable level over the operating life of the MODU/rig.

The most effective means of avoiding risk is by not conducting the activity at all or by removing the hazard completely. The risk treatment process should be hierarchical in application, meaning that priority should first be given to **Risk Avoidance based on the following principles of prevention.** .

1. "Is this task or activity absolutely necessary?"
2. "Can the design be improved to remove hazards at the source?", or
3. "Can we use a less hazardous material?"

If the activity is not necessary, then the task or activity should not be done if this will reduce the risk. For example, it can be asked, "Is it necessary to have so many people on the drill floor when repairing the crown sheaves?"

From a business point of view, there may be some HSE risks that are not appropriate (e.g., operating in water depths or air gap that may be very close to the tolerable or design limits). Such risks may not meet the tolerability screening criteria discussed earlier and so avoidance of the hazard may be chosen as the most appropriate risk treatment strategy. A further way of applying this strategy is by changing the process or redesigning the equipment to remove the hazard completely.

Defences should be considered after the assessment of possible avoidance / preventive measures, and should be aimed at mitigating the effects of a hazardous event once it has occurred. Defences to restrict escalation of a hazardous event, together with measures to protect personnel and to normalize the situation, may all be considered. Fire and gas detection systems, fire-water systems, active and passive fire protection, temporary refuge, evacuation systems, oil clean-up and recovery equipment and procedures, protective clothing, etc. are all examples of protective measures.

Risk Transfer usually refers to sharing of risk through joint venture operations or insurance. However, before any risk transfer is considered, Drilling Contractors must first ensure compliance with all applicable legislation / regulations and where appropriate relevant codes, standards and treaties. Transfer is rarely applied to HSE risk unless it is in the context of hiring specialists who are more appropriately trained and equipped to accept the transferred risk (e.g., asbestos removal, diving, etc.). It is important to note that transfer of risk does not result in transfer of responsibility or accountability from the risk owner.

Risk Optimization refers to finding a balance between negative risk and the benefits of the operation or activity; and between risk reduction and effort applied. By a Drilling Contractor effectively applying HSE Management in its organization, it can optimize risk to achieve levels of residual risk that are tolerable.

Each organization is unique and therefore each company and each MODU/rig will need to determine its optimum approach to reduce risk to a tolerable level. The organization will need to both assess the effectiveness of each barrier and assess how all the barriers for a cause, defeating factor, or consequence work together. The Drilling Contractor will need to consider its management system requirements, to assess options and decide what would best be applied. In addition, there are many industry codes, standards and "best practices" that may be applied, but each organization will still determine the optimum application. These Guidelines are not prescriptive and provide a framework to assist Drilling Contractors to systematically determine their own optimum solutions.

Factors that may influence the selection of measures to reduce risk include:

- the technical feasibility of the risk-reducing measure,

- the contribution of the risk-reducing measure,
- the costs and risks associated with implementing the measure,
- the degree of uncertainty associated with the risk, or the risk-reduction technique, including human factors.

A sequential approach to risk reduction should be adopted, giving attention first to those measures which have greatest effect in risk reduction for least effort. Successive evaluations of risk-reducing measures are undertaken until a point is reached where all the screening criteria have been satisfied and no further reasonable risk-reducing measures are possible.

Risk-reducing measures should be assessed to determine whether they are technically viable and have significant effect. In many situations such assessments can be left to the judgement of the person undertaking the risk management decision-making, who will decide what is satisfactory based upon experience and normal good practice.

In other situations, the effort required to implement a risk-reducing measure in terms of cost, time, difficulty, necessary resources, etc. needs to be considered against the benefit likely to be achieved.

An approach widely used is to evaluate the effort and cost involved in a number of different risk-reducing measures and to estimate the risk-reducing effect of each. By evaluating the cost or effort necessary to arrive at a common level of risk reduction it is often possible to identify those measures which are clearly more effective in risk reduction. In addition, sensitivity analyses should be included as part of any cost-benefit analysis in order to highlight the effect of uncertainties.

The uncertainties associated with cost-benefit analysis are such that the results of such analysis should only be used in conjunction with good engineering judgement when deciding whether or not to implement a risk-reducing measure.

Evaluation of risk-reducing measures should always be based on sound engineering principles and common sense. The following aspects should also be observed: local conditions and circumstances, the state of scientific and technical knowledge relating to the particular situation, and the estimated costs and benefits.

A recognized best practice for risk optimization is to address each risk systematically according to a strategic hierarchy (See 4.7.1 Risk Optimization Hierarchy).

4.7.1 RISK HIERARCHY

During the Risk Treatment step, priority should be given to Risk Avoidance to remove any unnecessary hazards and sources and to remove any unnecessary objects of harm, including unnecessary people or equipment. Most of the tasks and activities carried out on a MODU/rig are a necessary part of the business. Therefore the other risk optimization priorities that should be pursued are discussed according to the following hierarchy:

- **Prevention** – to ensure that adequate hardware and procedural controls or barriers are effectively in place to reduce the probability of releasing the

hazard's potential for harm (e.g., controlling ignition sources). The first and best strategy to apply is normally to establish barriers that always maintain the hazard under control.

- **Mitigation** – to establish effective barriers that will limit the undesirable effects in the event that preventive barriers fail and a hazard **is** released (e.g., smoke and fire detection systems).
- **Recovery** – to ensure that there are suitable barriers in place to prevent or limit escalation from the first event or hazard release (e.g., fire fighting systems, standby vessels, etc.) Included are arrangements to return to normal operations after an event.

The above strategies are intended to be applied together to reduce the residual HSE risks to levels tolerable to the Drilling Contractor. When the estimated risk rating and significance of the hazard increases, more barriers and layers of risk treatment are warranted, to reduce the risk.

4.7.2 RISK OPTIMIZATION STRATEGIES

Often, the most effective strategy to reduce risk is to apply various methods of prevention, mitigation and recovery measures that augment one another. These are referred to in these Guidelines as risk management “Barriers”. Throughout these Guidelines, reference has been made to terms like “practicable”, “reasonable”, “credible” and “optimized”. The reason for this is that the foundation of effective risk management is established by a Drilling Contractor applying its available resources on reducing the most significant risks while not ignoring the less significant risks. Based on this approach it is important to follow a systematic risk management process. This also enables a good risk analysis team to appropriately address all the hazards and sources with increasing levels of rigour as the significance and risk levels increase.

Figure 4.7.2.1 is the same RAM used previously with several risk barrier types superimposed on the right hand side to display one example of a risk optimization strategy.

Severity rating	Consequence				Increasing Probability				
	People	Environment	Assets	Reputation	A Never occurred in Industry	B Has occurred in Industry	C Has occurred in Company	D Multiple occurrence per year in Company	E Multiple occurrence per year at Location
0	zero harm	zero effect	zero damage	zero impact	General procedures in Management System (MS) Workplace Assessments Individual / verbal Job Hazard Analyses				
1	slight harm	slight effect	slight damage	slight impact					
2	minor harm	minor effect	minor damage	limited impact				Documented Job Hazard Analyses	
3	major harm	local effect	local damage	considerable impact				MS Activity Sheets/ Hazard Sheets	
4	single fatality	major effect	major damage	national impact	Task specific procedures		Rigorous Hazard Analysis		
5	multiple fatalities	massive effect	extensive damage	international impact					

Figure 4.7.2.1, Example Risk Optimization Strategy

Figure 4.7.2.1 represents how a management team can apply a systematic approach to optimize the risk management barriers applied on a MODU/rig. Referring to the Drilling Contractor's Hazard Register the team can begin to:

- Identify various possible prevention, mitigation and recovery barriers appropriate to the level of estimated risk;
- Assess the benefit of each barrier in terms of possible risk reduction;
- Assess the cost of each barrier in terms of money, time and effort; and
- Determine the barriers to apply in order to reduce risk to a tolerable or broadly acceptable level – considering the effectiveness of each barrier; (as depicted in figure 4.6.1.2).
- Describe the HSE Critical Activities/Tasks and the personnel responsible for them.

The process that is followed for risk optimization of every hazard and source is the same, but the rigour involved increases with the level of risk and its significance to the business. For hazards that have been estimated to have relatively low risks; reasonable barriers may be limited to general workplace procedures, workplace assessment, individual verbal instructions, etc. Justification of tolerability may be validated by the judgment of experienced personnel.

For hazards that pose medium level risks, more formal and documented barriers are appropriate such as Job Hazard Analyses, Hazard and Activity Sheets, task specific procedures, etc. Justification of tolerability should require some formal and documented substantiation.

Also, for hazards ranked as medium risk, further consideration may be necessary to identify Critical Activities or Tasks that are assigned to individuals who are responsible and accountable for ensuring that identified barriers are established, maintained and effective. Critical equipment may also be identified as barriers to

reduce medium risks. The Drilling Contractor's management system needs to ensure that personnel policies, training, competencies, attentiveness and alertness, and other human factors allow individuals to perform their Critical Activities or Tasks effectively and efficiently. Personnel alertness is affected by both mental and physical fatigue/wellness.

As risk levels further increase, they may begin to encroach on the Intolerable area of the RAM. More careful consideration of the hazards and associated risks involved is now justified. Overestimation of the effectiveness of the barriers intended to manage high risks could result in significant loss. Several layers of barriers and a rigorous structured risk control process are necessary and warranted. Identification of Critical Activities or Tasks is essential to effectively manage major hazards or high risk hazards and personnel with Critical Activities or tasks must be informed of their responsibilities and given the resources necessary to meet them.

4.7.3 SUMMARY OF OPERATION BOUNDARIES (SOOB) – COMBINED OPERATIONS

A Summary of Operation Boundaries (SOOB) is a record of the Defeated Barriers (either single or in combination) that have the potential to exceed the Drilling Contractor's tolerability limits of safe operations. (See Figure 4.7.3.1) The SOOB establishes the boundaries in which operations are permitted to be carried out. These defeating factors are qualitatively determined through the SHIDAC process, applying the appropriate experience.

The SOOB is a record of operations used to determine which combinations of combined, concurrent, or simultaneous operations are within the Drilling Contractor's tolerability limits and technical limitations (this should include consideration of offline operations and repairs/upgrades while operating). Some examples of simultaneous operations include: running subsea tree; offline tubular handling; running surface casing; changing out Wireline unit while drilling; etc.

The risk management activities described in Part 4 define the barriers that are required to ensure risks are reduced to a tolerable level and what resources are needed to maintain these barriers in an effective and available condition. However, in dynamic situations, Drilling Contractors may encounter suboptimal conditions and therefore decisions must be made under what parameters operations may proceed. These suboptimal conditions are identified during the SHIDAC process as Defeated Barriers.

A SOOB provides a framework to assist MODU/Rig supervisors and managers to decide when to continue certain activities, when the effectiveness of some critical barriers may be compromised, and potentially creating situations of increased risk. The SOOB is vital in establishing the operational boundaries when operating near limits of tolerability. It also provides the people at the worksite guidance in deciding when to stop operations due to weakened risk reduction measures and when to apply compensatory barriers to supplement such weaknesses. Supervisors need to apply their experience at the worksite and the SOOB assists them to understand the limits with respect to HSE risk management.

The SOOB should assist at the worksite in distinguishing between a “stop work” condition and a “proceed with caution” condition. This is often described in terms of a “dashboard” or “traffic light” system where, for example, an amber light may indicate caution while a red light indicates to stop. Barrier defeating factors should include issues such as: concurrent operations, non-routine activities, equipment that is not fit for purpose, safety systems disabled for maintenance, poor environmental conditions, abnormal process conditions, life saving systems unavailable due to damage or maintenance, absence of key personnel, etc.

For each of these factors, criteria should be included in the SOOB to indicate:

- what is optimum for operations,
- what is not optimum but still safe for operations,
- when caution is warranted due to increased risk,
- when compensatory barriers are needed to continue operations, and
- when the related activities should be stopped until barriers are restored or supplemented.

The SOOB should include criteria on how many concurrent “caution” conditions at the same location are tolerable. It is worth noting that the SOOB must consist of “permitted” operations and not solely of “prohibited” operations to avoid any misinterpretation that operations not specifically prohibited are permitted.

	Barrier 1 [MS Reference]	Barrier 2 [MS Reference]	Barrier 3 [MS Reference]	Barrier 4 [MS Reference]	Barrier 5 [MS Reference]	Barrier 6 [MS Reference]	Barrier 7 [MS Reference]	Barrier 8 [MS Reference]	Barrier 9 [MS Reference]	Barrier 10 [MS Reference]	Operation 5	Operation 4	Operation 3	Operation 2	Operation 1	Hazardous Operation 5	Hazardous Operation 4	Hazardous Operation 3	Hazardous Operation 2	Hazardous Operation 1
Hazardous Operation 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	a	-	-	-	-
Hazardous Operation 2	-	-	a	-	-	-	-	-	b	-	-	-	-	-	-	-	-	b	-	-
Hazardous Operation 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	b,c	-	-	b	-
Hazardous Operation 4	-	-	-	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-
Hazardous Operation 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	b,c	-	a
Operation 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operation 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	a	-	-	-
Operation 3	c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operation 4	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operation 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

 Do Not Proceed
 Authorized to Proceed
 Not Applicable
 a Caution clarification 1
 b Caution clarification 2
 c Caution clarification 3

Figure 4.7.3.1 - Example SOOB

How can this be achieved?

- By systematically applying a structured hazard control process, which includes:
 - Developing practicable potential risk treatment options for each hazard and source. These can be recommendations identified from risk assessment studies or from industry practices, professional judgment or experience.
 - Evaluating the benefit of each potential barrier in terms of benefits of risk reduction.
 - Assessing the cost of each potential barrier in effectiveness, monetary, time and effort terms.
 - Rejecting options where there is a gross disproportion between the cost of their implementation and risk reduction that would be achieved.
 - Comparing residual risks (based on barrier effectiveness) with the screening criteria and confirming that these residual risks are tolerable to the Drilling Contractor.
 - Completing the Drilling Contractor's Hazard Register and establishing an auditable trail documenting justification for accepting/rejecting risk reduction barriers.
 - Developing a Summary of Operation Boundaries (SOOB) that defines a framework for continued operations during conditions of (possible) reduced effectiveness of some risk management barriers.
- By identifying which barriers are presently established and by developing recommendations to establish new barriers. It may also include identifying barriers which may be obsolete and therefore can be removed to enable resources to be applied more effectively on other barriers.
- By establishing a process to track the implementation of all the selected barriers to completion in order to gain assurance when the risks have been reduced to a tolerable level.
- By including these risk reduction barriers into the Management System and by referencing and updating the HSE Case during the routine monitoring, inspection, audit and incident investigation processes to facilitate continuous improvement.

What should be (referenced) in the HSE Case?

- A description of the process used to systematically identify, evaluate and select the barriers that will be applied to reduce the risk for each identified hazard and source.
- The completed Drilling Contractor's Hazard Register listing all the hazards and sources, the estimates of the associated risks, the significance of these and references to the barriers selected to reduce the associated risks to a tolerable level.
- For the barriers addressing the major hazards and significant risks, also describe the Critical Activities, Defeating Factors, Defeating Factor Barriers and resources, competencies, etc. needed to ensure these are all established and

maintained. A Summary of Operation Boundaries (SOOB) should be provided in the HSE Case.

- References to the decisions made by the review team to document their justifications for rejected potential barriers or deferring the decision to a later date.
- Details of where relevant good practice and judgment based on sound engineering and ergonomic principles have been taken into account in determining what risks are tolerable.
- A list of all the barriers that have been selected to reduce risks, highlighting those that are already established and those that are not yet fully established.
- A prioritized remedial action plan to fully establish the remaining selected barriers, including action parties and proposed timescales for their implementation.

4.8 RISK ACCEPTANCE

Objective

To demonstrate that the organization has determined that the HSE risks and impacts are tolerable and that this has been agreed upon and formally approved by senior management.

Discussion

HSE Cases should be developed by a representative cross-section of the workforce who are directly involved with the specific MODU/rig and operation. However, the HSE Case is owned by the organization's Senior Management. Formal approval and acceptance by the Senior Management is required.

As mentioned in Part 4.7 risks can rarely be reduced to zero therefore some risk retention is usually necessary. The risk that is retained after the selected risk reduction measures have been applied is referred to as residual or net risk. These risks all must be accepted as tolerable in order for the associated operations and business activities to continue.

Whenever risk levels are determined significant, it should be explicitly stated, understood and approved by the appropriate level of management. The risk management strategies and barriers intended to treat the high risk and significant hazards should be clearly communicated to the organization's senior management team.

Every organization will have a certain 'risk tolerance' within the context of the greater business environment. This may be difficult to describe and quantify. It may also change over time and in response to certain events or situations, yet the risk tolerance is an important factor in determining what risk treatments are perceived to be 'fit-for-purpose'. Management is responsible for setting the boundaries, or parameters, for risk acceptance. Therefore, authority levels for HSE risk acceptance should be clearly established within the organization's management system and communicated to those individuals involved with any part of the risk management process.

It may be necessary for the organization to develop a remedial action plan, requiring the allocation of resources, to ensure barriers are established. With a good knowledge of the risk management process and how these recommendations were developed, management is better able to commit the appropriate resources.

How can this be achieved?

- By the Drilling Contractor's senior management accepting the resulting HSE management assurance provided through the HSE Case process.

What should be (referenced) in the HSE Case?

- A statement by the Drilling Contractor senior management accepting the risk management process applied by the HSE Case development team.
- Action plan for follow-up and close-out of recommendations to address gaps in HSE performance that may prevent risks from being deemed tolerable.
- A statement by the Drilling Contractor senior management:
 - endorsing the risk assessments and risk treatments,
 - accepting the residual risks,
 - accepting the boundaries described in the SOOB,
 - concluding that the risks levels are tolerable (qualified if necessary to acknowledge the items in the remedial action plan), and
 - committing to implement the remedial action plan (if necessary).

4.9 RISK COMMUNICATION

Objective

To share the results of the risk management process (i.e., HSE Case) with relevant stakeholders and to establish a framework where stakeholders can provide input to continuously improve the overall risk management as documented in the HSE Case.

Discussion

Risk Communication is defined as, "the exchange or sharing of information about risk between the decision-maker and other stakeholders." ISO Guide 73 also notes that, "the information can relate to the existence, nature, form, probability, severity, acceptability, treatment or other aspects of risk."

Often during the risk management process, several methods are applied to determine risk levels and how to treat the risks. When more complex structured review techniques are applied, the uncertainties and the assumptions used must be appreciated and considered when assessing necessary risk-reduction measures. It is important that these uncertainties and assumptions are well documented and communicated to the personnel who are applying critical activities or tasks in their daily work planning as well as longer term decision-making to ensure barriers are effectively maintained.

4.9.1 DRILLING CONTRACTOR'S SCOPE OF OPERATION

Each Drilling Contractor is required to define and develop a document described as the "Drilling Contractor's Scope of Operations", (See Table 4.9.1.1, Example - Drilling Contractor's Scope of Operation). This is a document for communicating the risk management hazards and barriers to the workforce. This table includes **Hazardous Operations** and **Critical Activities/Tasks** as defined per the following:

Hazardous Operations can be defined as – Operations with the potential to release one or more Major Hazards or defeat barriers for one or more Major Hazards.

Critical Activities / Tasks can be defined as – An activity or task which provides or maintains barriers (including HSE Critical equipment). (These tasks may or may not be hazardous in themselves, e.g., maintenance tasks, monitoring alarm, gas detector testing, Permit-To-Work.)

The Drilling Contractor's Scope of Operations requires inclusion of the following:

- sources of hazards related to the Drilling Contractor's scope of operations.
- major and other workplace hazards associated with each of the sources of hazards (operations).
- review the relationship of hazardous operations to assist in determining critical activities / tasks.
- determine potential risk rating for identified sources of hazards with respect to their significance to the business and operation. The ranking of risk is based on those hazards included in the risk scope of operations.

Drilling Contractors Scope of Operations				
Sources of Hazards	Critical Activity / Task	Risk Rating	Hazardous Operation	Potential Hazards
Tripping Drill Pipe into Wellbore			YES	<p>Major Hazards</p> Hydrocarbons in formation Overhead equipment / elevated objects <p>Other Workplace Hazards</p> Personnel at height > 2m Equipment with moving or rotating parts Objects dropping from Derrick Lifting and Hoisting
Tripping Drill Pipe out of Wellbore			YES	<p>Major Hazards</p> Hydrocarbons in formation Overhead equipment / elevated objects <p>Other Workplace Hazards</p> Personnel at height > 2m Equipment with moving or rotating parts Objects dropping from Derrick
Mixing Drilling Fluid			NO	<p>Major Hazards</p> None <p>Other Workplace Hazards</p> Manual and Mechanical Material Handling Equipment with moving or rotating parts Chemical Exposure
Well Testing			YES	<p>Major Hazards</p> Hydrocarbons in formation Overhead equipment / elevated objects Condensate, NGL <p>Other Workplace Hazards</p> Personnel at height > 2m LPGs Overhead equipment / elevated objects Manriding in the Derrick Objects dropping from Derrick Pipework under Pressure
Displacing Wellbore			YES	<p>Major Hazards</p> Hydrocarbons in formation Overhead equipment / elevated objects <p>Other Workplace Hazards</p> Personnel at height > 2m
Wireline Logging			YES	<p>Major Hazards</p> Hydrocarbons in formation Overhead equipment / elevated objects Perforating gun charges <p>Other Workplace Hazards</p> Personnel at height > 2m Equipment with moving or rotating parts
Well completion			YES	<p>Major Hazards</p> Hydrocarbons in formation Overhead equipment / elevated objects Perforating gun charges <p>Other Workplace Hazards</p> Personnel at height > 2m Pipework under pressure
Cementing			YES	<p>Major Hazards</p> Hydrocarbons in formation Overhead equipment / elevated objects <p>Other Workplace Hazards</p> Personnel at height > 2m Pipework under pressure

Table 4.9.1.1, Example - Drilling Contractors Scope of Operations

4.9.2 WORKFORCE COMMUNICATION TO DRILLING CONTRACTOR SENIOR MANAGEMENT

In addition to communicating information to the workforce, there should be a mechanism in place for the workforce, clients, third-parties, and regulatory bodies to share information with the management to enable them to continuously contribute to improving HSE Management. Such mechanisms for obtaining regular and ongoing feedback regarding the risk responses need to be included into the organization's overall HSE Management.

4.9.3 MONITORING AND VERIFICATION

Monitoring is intended to confirm that risk treatment barriers are operating effectively and as designed. This includes various methods of day-to-day supervision (both at and away from the worksite), to ensure that procedures are understood, followed and current. It also includes routinely verifying whether expected barriers are working and established performance standards met.

While it is not always feasible or practical to regularly confirm the effectiveness of every barrier, it is important to regularly confirm the effectiveness of the barriers for high risk hazards and to confirm that the critical activities and tasks are being performed as expected. This is an important part of effective risk management and should be integrated into the Drilling Contractor's management system.

4.9.4 FEEDBACK TO THE DRILLING CONTRACTOR MANAGEMENT SYSTEM

Information from creation of bridging documents, inspections, audits and incident analyses should be considered when reviewing HSE Management activities to facilitate continuous improvement.

How can this be achieved?

- By regularly reviewing the HSE Case information and including changes to the Drilling Contractor's management system when necessary.
- By making the HSE Case information easily available to any worker who may be required to review it (e.g., in the control room, Permit-To-Work issuer's office, installation medical clinic, etc.)
- By making the HSE Case information easily available (either electronically or as a paper document) to be used by supervisors to discuss relevant hazards, risks and risk treatment barriers (e.g., during Job Hazard Analysis, pre-task meetings, etc.)
- By periodically discussing critical activities and tasks with individuals who have responsibilities to perform them. Additionally, to verify whether the required resources are adequate, and how best to improve the effectiveness of the barriers.

What should be (referenced) in the HSE Case?

- A description of how the HSE Case will be communicated to the workforce.
- A description of how any training requirements for individuals assigned to critical activities will be identified, delivered and verified.
- A description of how the HSE Case is intended to be used by the workforce.

5 EMERGENCY RESPONSE

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INTRODUCTION

The HSE Case needs to demonstrate that HSE management objectives are met.

Parts 2, 3 and 5 of these Guidelines present HSE Management objectives that have been determined through experience by IADC members as those necessary to demonstrate assurance that risks in the Drilling Contractor's scope of operation are at a level tolerable to the Drilling Contractor. These HSE management objectives must be taken into consideration and evaluated during the Risk Assessment in Part 4 of these guidelines.

By evaluating these HSE management objectives in Part 4, the Drilling Contractor either:

- Demonstrates assurance that HSE management objectives are being met, or
- Identifies where arrangements to meet HSE management objectives are ineffective or not in place, and what compensatory measures are necessary to meet all the HSE management objectives.

A Drilling Contractor may identify additional controls to meet HSE management objectives during the Risk Assessment described in Part 4 of these Guidelines.

Part 2 contains HSE management objectives relating to procedural (human factor) controls and Part 3 contains descriptions of the equipment and systems (hardware factors) to meet the HSE management objectives.

Part 3 describes the equipment and systems necessary to meet the HSE management objectives described in Parts 2 and 5. The equipment and systems must be considered in Part 4.

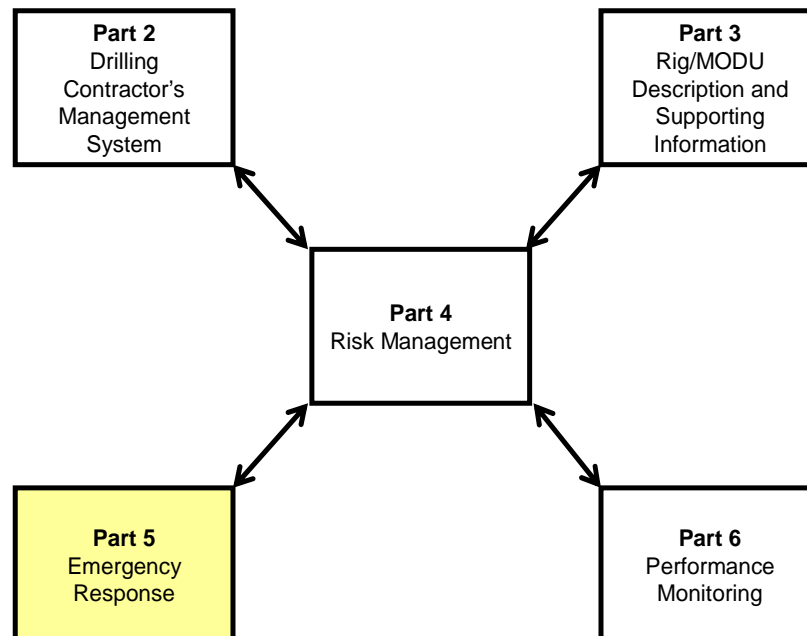


Figure 5.0.1 – HSE Management Assurance

To provide assurance that the Drilling Contractor is managing HSE effectively, Parts 2, 3, 5, and 6 must be applied in conjunction with a structured risk assessment process as described in Part 4..

Part 5 contains HSE Management objectives to demonstrate that emergency response arrangements have been systematically assessed and that suitable plans are in place to respond to all foreseeable emergency situations.

These HSE Management objectives are organized by the following elements of Emergency Response:

- Emergency Response Management.
- Command and communication.
- Training/Drills for emergencies.
- Temporary Refuge details.
- Details of evacuation and escape equipment.
- Means of recovery to a place of safety.

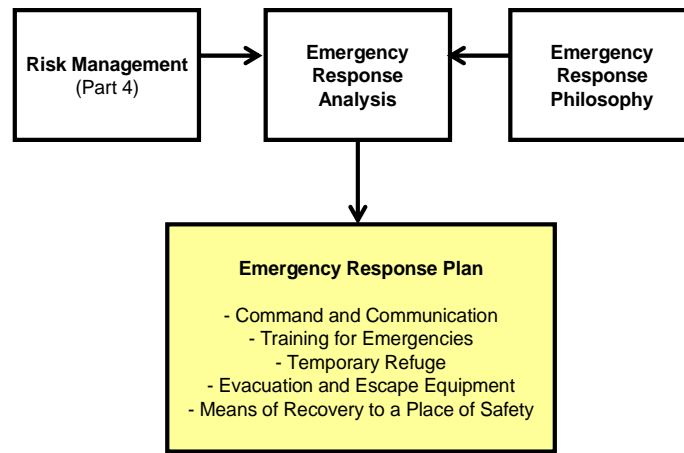


Table 5.0.2 – Emergency Response Management

EMERGENCY RESPONSE MANAGEMENT

To achieve the Drilling Contractor's HSE management objectives related to Emergency Response, the Drilling Contractor must develop effective Emergency Response Plans. The Emergency Response Plans must be developed considering the results of an Emergency Response Analysis. The Emergency Response Analysis considers the specific location/area of operation and is developed based on the results of the Risk Assessment in Part 4 and the Drilling Contractor's Emergency Response Philosophy. (See Figure 5.0.2.)

5.1 EMERGENCY RESPONSE MANAGEMENT

5.1.1 Emergency Response Philosophy

Objective

To demonstrate:

- Commitment to developing and maintaining effective emergency response capabilities.
- Establishing HSE Management objectives against which the capabilities can be assessed.

How can this be achieved?

- Senior management providing appropriate resources for emergency response arrangements.
- Establishing emergency response philosophy and HSE Management objectives with regard to:
 - ensuring the safety of personnel during an emergency
 - provision of facilities and equipment for rescuing and treating the injured
 - rescuing personnel from the MODU or Rig and taking them to a place of safety
 - effective interfacing and communication between all parties

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of emergency response policy.
- HSE Management objectives that reflect the Drilling Contractor's emergency response philosophy.

Note: It is generally the case that the client will have specific legal or contractual responsibilities related to Emergency Response. These should be clearly addressed in the bridging document. The Drilling Contractor should take care to assure the continuity of necessary Emergency Response arrangements as a MODU or Rig is released from a contract.

5.1.2 Emergency Response Analysis

Objective

To demonstrate that for each of the major hazards and other workplace hazards identified in Part 4 – Risk Management, the emergency response arrangements have been systemically and specifically analyzed for the MODU/Rig. (Drilling Contractor's Hazard Register Table 4.4.1.)

How can this be achieved?

- Ensuring emergency response is an integral part of the hazard identification and risk assessment process (See Part 4 – Risk Management).
- Ensuring that the analyses includes input from MODU or Rig crew members with the appropriate knowledge and experience.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Summary of the analyses that have been carried out with conclusions, including the preferred hierarchy of emergency response.

5.1.3 Emergency Response Plan

Objective

To demonstrate that:

- relevant information from the Emergency Response analysis is included in the development of the emergency response plan
- information contained within the plan is readily available to assist with decision making during an incident.

How can this be achieved?

- Identifying the information in the Emergency Response analysis that is directly relevant to the command and control of an emergency.
- Presenting the information in such a way that it can be easily referenced during an emergency.
- Ensuring that all personnel with responsibilities for Emergency Response on or off the MODU/Rig are fully involved in the development and revision of emergency response plans.
- Ensuring that all personnel with responsibilities for Emergency Response (ER) on or off the MODU/Rig are fully:
 - competent to perform their ER duties,
 - aware of the content and relevance of the plan, and
 - aware of their specific roles and responsibilities.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Confirmation that the Emergency Response Plan contains relevant information from the Emergency Response analysis (See Part 5.1.2 – ER Analysis).
- Description of the process for revising and updating the emergency response plan.
- Details of the involvement of MODU/Rig personnel in the development and updating of the emergency response plan.
- Details or reference to emergency procedures, including but not limited to the following:

Shallow Gas Blowout	Well Control
Fire and Explosion	Man Overboard
Mooring Failure	Loss of Stability or Structural Failure
Extreme Weather	Loss of Control in Transit
Collision with Another Vessel	Foundation Failure
Helicopter Crash into the Sea or onto the MODU/Rig	Evacuation and Abandonment of MODU/Rig
Rescue from Confine Space	Emergency Notification

Rescue from Heights	Medical Emergency Response, including preventive pandemic precautions
Search and Rescue for a Missing Person Onboard	Total Power Failure
Hydrogen Sulphide (H ₂ S).	Spill Response
Health Incident (e.g., outbreak)	Any Other Site-Specific, Area or Location Emergency

5.2 COMMAND AND COMMUNICATION

5.2.1 Command During Emergencies

Objective

To demonstrate that there is an effective command structure for responding to emergency situations.

How can this be achieved?

- Establishing a clearly defined emergency command structure (both onshore and offshore) for all incidents.
- Ensuring all key personnel (Drilling Contractor, Client and other Third Parties) are aware of their roles and responsibilities during an emergency.
- Ensuring all personnel with emergency command responsibilities are competent to perform their duties (See Part 5.3 – Emergency Response Training).
- Ensuring that adequate facilities are established for effective command and control during emergencies. This includes control rooms, communications equipment, drawings, operations manuals and medical equipment and facilities for injured persons, etc.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- A display of the command and control hierarchy in an emergency situation as it will be reflected on the muster list and station bill.
- Details of roles and responsibilities of key individuals including Drilling Contractor, Client and other Third Party personnel as appropriate in MODU/rig specific Emergency Response Plans.
- Details of the key competence requirements for personnel with emergency command responsibilities and the method used to verify that these individuals maintain this competency.
- Details of the emergency control room facilities, equipment and documentation.

5.2.2 External Emergency Response Support

Objective

To demonstrate that, in the event of an incident, arrangements are in place to provide and coordinate external support.

How can this be achieved?

- Establishing an onshore emergency response support team.

- Establishing client and location specific arrangements at the commencement of a contract and prior to any MODU or Rig moves for:
 - external support responsibilities (private and public)
 - standby equipment, vessels and helicopters
 - oil spill response.
- Establishing interface requirements with the relevant local (municipal) and regional authorities.
- Updating emergency response plans and informing personnel with responsibilities for emergency response.
- Periodically testing the arrangements through drills and exercises.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of the Drilling Contractor's external emergency response support arrangements.
- Details of arrangements for consultation and cooperation with other parties who have been identified as external emergency response support, e.g., national coastguards, local (municipal) and regional authorities.
- Details of the arrangements for establishing and approving emergency response arrangements with clients.
- Arrangements for external emergency response support included in Emergency Response Plan (See Part 5.1.3 – Emergency Response Plan).
- Details of arrangements for Drill and Exercises including external emergency response support. (See Part 5.3.2.)

5.2.3 Communications

Objective

To demonstrate that sufficient and effective communications are available between all responsible parties in an emergency situation.

How can this be achieved?

- By ensuring there are suitable systems and equipment, with back-ups, for communicating in an emergency between the:
 - MODU or Rig emergency command centre and all areas on the MODU or Rig
 - MODU or Rig emergency command centre and external support teams, helicopters and supporting vessels, etc.
- Ensuring that personnel are competent in the use of the communication equipment.
- Ensuring that emergency response communication equipment is maintained.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Summary of the communication systems, including back-ups, on the rig or reference to Part 3.4.6 - Communications.
- Description of the external emergency control centre(s) for MODU's.

5.3 TRAINING FOR EMERGENCIES

5.3.1 Emergency Response Training

Objective

To demonstrate that all personnel (including the person in charge) are competent to fulfil their emergency roles.

How can this be achieved?

- By ensuring the person in charge and his alternate(s) have been trained and assessed in Major Emergency Management.
- By ensuring all personnel working on the MODU or Rig have valid training certificates for emergency management recognized by industry or required by regulations.
- By identifying the additional training and competency required by emergency response team members.
- Ensuring that emergency response training and competence requirements are complied with.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the Major Emergency Management training and refresher training requirements for the person in charge and his alternate(s).
- Details of the emergency response training and refresher training requirements for key personnel (including personnel with fire fighting, pollution response, or medical treatment roles).
- Reference to the competence assessment arrangements in Part 2.2.4.

5.3.2 Drills and Exercises

Objective

To demonstrate the readiness of emergency response capabilities through a programme of drills and exercises that:

- tests and develops the command and communication arrangements, including offsite and onshore support,
- tests emergency equipment under realistic conditions,
- maintains and develops individual competencies in emergency response, including command and control activities,
- monitors the performance of individuals to identify areas of improvement and any additional training requirements,
- verifies data and assumptions used in the emergency response assessments, e.g. times to muster, man overboard recovery etc.

How can this be achieved?

- Developing and implementing a drill and exercise programme, based on the credible scenarios identified in Part 4, that will ensure that all procedures of the emergency response plan are practiced and tested for realistic potential incidents, including the command and control activities (including IMO Resolution A.891 – Recommendations on training of personnel on mobile offshore units (MOUs), where applicable).

- Establishing arrangements for monitoring and reviewing the effectiveness of emergency response drills and exercises and those performing them.
- Identifying information used to verify the readiness of the emergency response capabilities.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the emergency response drills and exercises programme.
- Details of the arrangements for monitoring and reviewing the effectiveness of the drills and exercises in establishing and maintaining the readiness of emergency response capabilities.

Note: If not part of the Drilling Contractor's Management System, the bridging document should clearly specify the expectations regarding the participation of client and third-party personnel in onboard drills and exercises.

5.3.3 HSE Inductions

Objective

To demonstrate that all personnel arriving on the MODU/Rig are fully briefed on their responsibilities related to emergency response arrangements.

How can this be achieved?

- Ensuring that the HSE induction programme includes:
 - briefing on the MODU or Rig emergency response arrangements (including individual responsibilities)
 - demonstrations, as appropriate, of personal protective equipment, lifesaving appliances, etc.
 - familiarization tour of the MODU or Rig showing location of station bill/muster list, muster points, TEMPSC and life raft locations, etc.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Reference to HSE Induction in Part 2.2.4.5 – Induction Programme.

5.4 TEMPORARY REFUGE ASSESSMENT

5.4.1 Temporary Refuge (TR) Concept and Description

Objective

To demonstrate that the TR is suitably designed, constructed and equipped to act as a command centre and refuge during emergencies.

How can this be achieved?

- Defining an area within the MODU as the Temporary Refuge (TR).
- Ensuring that the TR is suitably constructed and equipped e.g. fire walls, ventilation systems, smoke and gas detection systems, etc.
- Ensuring TR is suitably equipped to act as an emergency command centre.

- Ensuring sufficient quantities of personal protective equipment, e.g. immersion suits, floatation aids etc, are located within the TR for all personnel.
- Providing access/egress to evacuation points.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Description of TR location and arrangements, including:
 - fire and explosion protection (internal and external)
 - HVAC system, smoke and gas detection and shutdown arrangements
 - facilities within the TR e.g. control rooms, muster areas, first aid etc.
 - control and communication systems which are accessible from within the TR e.g. BOP control panel, ballast control, etc.
 - personal protective equipment stored in TR.
 - access and egress routes to evacuation points.

5.4.2 Loss of the Temporary Refuge (TR) Integrity

5.4.2.1 Major Incidents with the Potential for Immediate Impairment of the TR

Objective

To demonstrate that the major incidents with the potential to defeat the integrity of the TR have been identified and alternative arrangements have been assessed.

How can this be achieved?

- From the risk assessment, identify the major incidents that have the potential to defeat the integrity of the TR. The TR is an important Barrier, Defeating Factor Barriers would be defined to address all the associated HSE critical activities and equipment. These results should be considered in the development of the Summary of Operation Boundaries (SOOB). Refer to Part 4 – Risk Management for more detail on this process.
- Identify alternative actions to be taken in the event the integrity of the TR is immediately lost.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- A list of incidents with potential to defeat the integrity of the TR.
- Alternate actions and mustering areas, should the integrity of the TR be lost or should the TR be inaccessible for some personnel.

5.4.2.2 Temporary Refuge Integrity Requirements

Objective

To demonstrate that the TR can provide protection for a period of time to allow for the abandonment of the MODU.

How can this be achieved?

- Through comparing mustering and evacuation times (See Part 5.5.1 – Evacuation and Escape Systems) with the assessment of fire and explosion events to ensure that the TR can provide protection until evacuation has occurred.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- A requirement of how long the TR integrity must be maintained.

5.5 DETAILS OF EVACUATION AND ESCAPE EQUIPMENT

5.5.1 Evacuation and Escape Systems

Objective

To demonstrate that there is suitable and sufficient evacuation and escape systems on the MODU or Rig.

How can this be achieved?

- Providing equipment in accordance with applicable regulatory requirements.
- Carrying out an assessment of the evacuation and escape arrangements to:
 - evaluate the times required for mustering and evacuation
 - determining the suitability of the equipment provided to meet regulatory requirements (e.g., size and numbers of equipment in relation to personnel on board and work locations).
 - determine the suitability of the systems and equipment for all foreseeable major incidents.
- Providing evacuation systems and equipment to reduce risks to a tolerable level.

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

Description of the evacuation and escape arrangements with reference to life saving equipment plans.

- Statement of compliance with regulatory requirements.
- Summary of evacuation and escape assessment including mustering and evacuation times
- Reference to Part 5.3.2 – Drills and Exercises, regarding the arrangements for verifying the mustering and evacuation times used in the assessments.

5.5.2 Means of Recovery to a Place of Safety

Objective

To demonstrate that suitable arrangements will be established to get people evacuating/escaping from the MODU or Rig to a place of safety.

How can this be achieved?

- Identifying the preferred means of evacuation, e.g., helicopter, standby boat, etc.
- Establishing means for rescuing personnel, should the preferred method be unavailable:
 - evacuating by TEMPSC
 - escaping by life rafts or marine escape systems
 - escaping into the sea, including an assessment of survivability in the prevailing sea conditions, and recovering them to a place of safety

- Establishing and approving location specific emergency response arrangements with client e.g. standby vessels, helicopters (reference Part 5.2.2 – External Support).

What in the Drilling Contractor's Management System (Emergency Response Plans) demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Statement of preferred means of evacuation.
- Description of the arrangements for rescuing personnel evacuating from the MODU or Rig.
- Description of the arrangements for rescuing personnel escaping in life rafts or from the water.
- Arrangements for developing and assessing client and location specific rescue arrangements.
- Arrangements for obtaining support from both the private and public sector.
- Estimated survival times in the sea and estimated recovery times from the sea for each reasonably foreseeable event likely to lead to the need for recovery or rescue from the sea. The margin between survival time and rescue time should be sufficient to clearly demonstrate there is a good prospect of recovery, taking into account the effects of uncertainty.

6. PERFORMANCE MONITORING

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6.1 INTRODUCTION

The HSE Case needs to demonstrate that HSE management objectives are met.

Parts 2, 3 and 5 of these Guidelines present HSE Management objectives that have been determined through experience by IADC members as those necessary to demonstrate assurance that risks in the Drilling Contractor's scope of operation are at a level tolerable to the Drilling Contractor. These HSE management objectives must be taken into consideration and evaluated during the Risk Assessment in Part 4 of these guidelines.

By evaluating these HSE management objectives in Part 4, the Drilling Contractor either:

- Demonstrates assurance that HSE management objectives are being met, or
- Identifies where arrangements to meet HSE management objectives are ineffective or not in place, and what compensatory measures are necessary to meet all the HSE management objectives.

A Drilling Contractor may identify additional controls to meet HSE management objectives during the Risk Assessment described in Part 4 of these Guidelines.

Part 2 contains HSE management objectives relating to procedural (human factor) controls and Part 3 contains descriptions of the equipment and systems (hardware factors) to meet the HSE management objectives.

Part 3 describes the equipment and systems necessary to meet the HSE management objectives described in Parts 2 and 5. The equipment and systems must be considered in Part 4.

Part 5 contains HSE Management objectives to demonstrate that emergency response arrangements have been systematically assessed and that suitable plans are in place to respond to all foreseeable emergency situations.

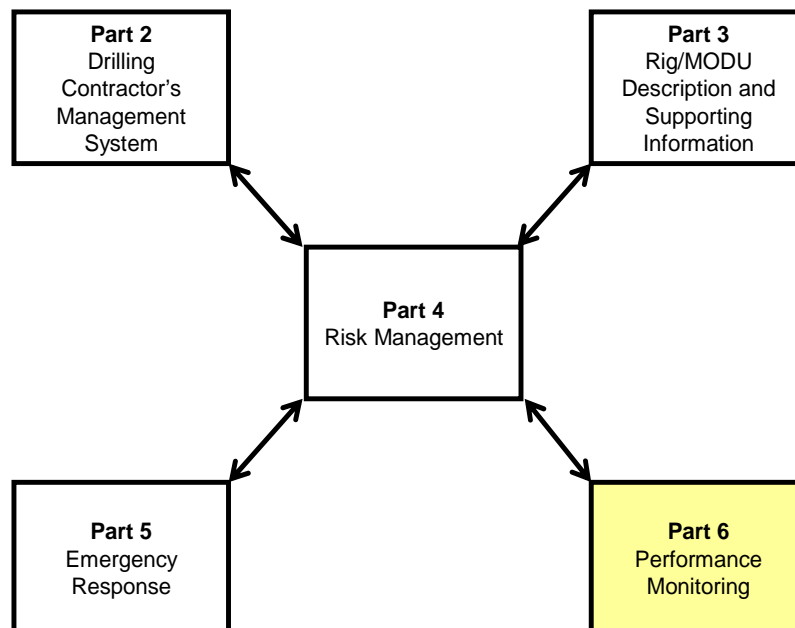


Figure 6.1.1 – HSE Management Assurance

Parts 6 of these Guidelines contains HSE Management objectives that have been determined through experience by IADC members as those necessary to demonstrate assurance that risks in the Drilling Contractor's scope of operation will be **maintained** at a level tolerable to the Drilling Contractor. Part 6 ensures that the barriers identified in Part 4 (considering Parts 2, 3, and 5) are effectively **implemented** and that the effectiveness of the barriers will be maintained for the life of the MODU/Rig. The Performance Monitoring HSE Management objectives in Part 6 must also be considered as barriers in the Risk Assessment in Part 4.

To provide assurance that the Drilling Contractor is managing HSE effectively, Parts 2, 3, 5, and 6 must be applied in conjunction with a structured risk assessment process as described in Part 4.

6.2 PERFORMANCE MONITORING

Performance Monitoring is a Management System Element in a Drilling Contractor's management system (See Part 2).

Performance Monitoring can be considered to have three major aspects: Periodic Monitoring; Audit and Audit Compliance; and Verification of HSE Critical Activities/Tasks and Equipment/Systems. (See Table 6.0.1)

- The Drilling Contractor defines the arrangements for **Periodic Monitoring** by supervisors and other line management to ensure that plans and operations are implemented and maintained and for measuring HSE performance (incident reporting and analysis, behaviour-based observation, etc).
- Assessing the overall effectiveness of the HSE Management (within the Drilling Contractor's Management System) through **Audit and Audit Compliance** including Management review of HSE performance against the HSE management objectives.
- **Verification of HSE Critical Activities/Tasks and Equipment/Systems** for implementation and effectiveness.

PERFORMANCE MONITORING	
	<p>Periodic Monitoring</p> <ul style="list-style-type: none"> – Scope includes barriers that address Major Hazards and Other Workplace Hazards associated with the Drilling Contractor's daily operations – Performed by individuals, supervisors and other line management at the worksite
	<p>Audit and Audit Compliance</p> <ul style="list-style-type: none"> – Scope includes barriers that address Major Hazards and Other Workplace Hazards associated with the Drilling Contractor's scope of operations – Performed by Drilling Contractor's personnel not directly responsible for the MODU's/Rig's operation
	<p>Verification of HSE Critical Activities/Tasks and Equipment/Systems</p> <ul style="list-style-type: none"> – Scope includes HSE Critical Activities/Tasks and Equipment/Systems (i.e., barriers that address Major Hazards) – Performed by: <ol style="list-style-type: none"> a) Drilling Contractor personnel not directly responsible for the MODU's/Rig's operations, or b) personnel from a different organization i.e., regulator, classification society, client, third party etc.

Table 6.0.1 – Performance Monitoring

6.3 PERIODIC MONITORING

Objective

To demonstrate arrangements are in place for monitoring Drilling Contractor's HSE management of Major Hazards and Other Workplace Hazards on a daily basis.

How can this be achieved?

- Ensuring HSE management is reviewed daily by MODU/Rig management at the worksite.
- Line managers and supervisors monitoring compliance with daily procedures and applicable standards.
- Line managers and supervisors monitoring personnel for lack of competency, alertness, attentiveness, fatigue level, confidence, and other human factors that could affect their performance.
- Establishing programme of daily workplace inspections (including behaviour-based observation and working conditions).
- Identifying proactive performance measures (e.g., Performance Standards) related to HSE Critical Activities/Tasks and Equipment/Systems which provide an indication of current performance and act as indicators of future performance.
- Identifying proactive performance measures related to Other Workplace Hazards which provide an indication of current performance and act as indicators of future performance.
- Identifying reactive performance measures (incident analysis, management review, etc.) which provide an indication of current performance and act as indicators of future performance.
- Regularly assessing the performance, identifying trends and implementing improvements. Performance standards should embrace both technical systems and human performance.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Information on line manager's and supervisor's responsibilities for continual monitoring of compliance with HSE procedures and standards.
- Details of workplace inspection schemes.
- Details of the proactive (leading) HSE performance indicators.
- Details of arrangements for recording and analyzing HSE performance.
- Details of the arrangements for discussing and reviewing HSE performance at the different levels within the organization from both a technical and human performance perspective.

6.3.1 Incident Reporting and Analysis

Objective

To demonstrate that there are arrangements for reporting, analysis and learning from incidents and work related illnesses.

How can this be achieved?

- Developing and maintaining procedures for reporting and trending HSE incidents, including near hits, as well as those incidents involving chronic health and environmental risk management (e.g. noise, repetitive strain, frequent spillages, waste non-conformances, etc.)

- Developing criteria for establishing incident (potential) risk and significance to the business.
- Establishing procedures for investigating and analyzing incidents, and work-related illnesses.
- Providing relevant training to personnel involved in incident investigation and analysis.
- Identifying the immediate causes (the failed barriers) and underlying system level weaknesses that result in significant incidents.
- Developing and implementing recommendations to correct both the identified failed barriers and the system level weaknesses to prevent related incidents from recurring.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- A summary of the incident reporting and investigation arrangements.
- Details of the potential incident criteria that is used.
- Information on the training provided for incident investigation team members.
- Information on the methodology adopted to identify incident causes.
- Description of the arrangements for tracking action items arising from investigations to completion.

6.3.2 Behaviour-Based Observation Systems

Objective

To demonstrate that members of the workforce monitor HSE practices through a structured behaviour based observation process.

How can this be achieved?

- Implementing a suitable observation and monitoring process.
- Providing training and instruction on the application of the process.
- Taking action on the issues identified through the process.
- Providing feedback to people raising issues through the process.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the behaviour based observation process including occupational health aspects.
- Training and instruction given to employees and contractors on its application.
- Details of the arrangements for processing and reviewing issues identified through the process.

6.3.3 Health/Environmental Monitoring and Measurement

Objective

To demonstrate that the Occupational Health exposures and environmental impact of discharges and emissions are being adequately monitored and measured

How can this be achieved?

- Ensure that Occupation Health exposures are monitored at the worksite and living quarters

- Where discharges and emissions are measured at the worksite; to ensure that the measurements are documented and meet applicable regulatory requirements.
- Where discharges and emissions are estimated; to ensure that the methods of estimation are documented and appropriate.
- Where discharges are directly measured, to ensure that measurement equipment is being correctly operated and calibrated according to documented procedures.
- Where background environmental monitoring is taking place; to ensure that sampling and analysis procedures are documented and based on sound field practices.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the arrangements for monitoring Occupational Health exposures.
- Details of the arrangements for monitoring discharges and emissions which have the potential to cause adverse environmental impacts.

6.4 AUDIT AND AUDIT COMPLIANCE

Objective

To demonstrate effective arrangements are in place for Drilling Contractor's personnel not directly responsible for the MODU's/Rig's operations to audit the HSE Management addressing the Major Hazards and Other Workplace Hazards associated with the Drilling Contractor's scope of operations.

How can this be achieved?

- Developing and maintaining a formal and documented audit programme.
- Establishing suitable arrangements for Drilling Contractor's personnel not directly responsible for the MODU's/Rig's operations to audit the HSE Management addressing the Major Hazards and Other Workplace Hazards associated with the Drilling Contractor's scope of operations (may either be included or separate from the arrangements established in Verification of HSE Critical Activities/Tasks and Equipment/Systems below 4.2.6).
- Ensuring competent personnel not directly responsible for the MODU's/Rig's operations are appointed to lead and participate in audits.
- Establishing arrangements for following up and closing out audit findings.
- Communicating audit results to senior management, and to the departments and locations audited.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- Details of the audit scope including:
 - HSE barriers identified in Part 4 – Risk Management
 - Drilling Contractor's requirements
 - Flag State Requirements
 - Coastal State Requirements
 - Classification Society Requirements
 - Client Requirements
 - Any other applicable requirements

- Details of the audit process including:
 - Audit Team Selection, Roles and Responsibilities
 - Audit Data Collection – Document Record Examination
 - Observation of Work Activities (People and Equipment)
 - Record of Testing, Sampling and Observations
 - Audit Analysis – Trends, etc.
 - Reporting of Audit Findings
 - Corrective Action Follow-up and Closeout
 - Management Review of Findings
 - Audit Record Retention
- Details of the arrangements for training audit team personnel.
- Details of the arrangements for tracking actions arising from audits to completion.

6.5 VERIFICATION OF HSE CRITICAL ACTIVITIES/TASKS AND EQUIPMENT/SYSTEM

Objective

To demonstrate that arrangements are in place for verifying HSE critical activities/tasks and equipment/systems remain effective by: a) Drilling Contractor personnel not directly responsible for the MODU's/Rig's operations, or b) personnel from a different organization i.e., regulator, classification society, client, third party etc.

How can this be achieved?

- Identifying HSE critical activities/tasks and equipment/systems. (See Part 4.)
- Ensuring that Drilling Contractor's personnel performing verification activities are competent in:
 - the information in the HSE Case
 - Drilling Contractor's management system
 - HSE management objectives
 - Applicable regulations and legislation
- Ensuring that personnel from a different organization performing verification activities (if applicable) are competent in:
 - the applicable information in the HSE Case
 - the applicable parts of the Drilling Contractor's management system
 - the applicable HSE management objectives
 - Applicable regulations and legislation
- Establishing suitable arrangements for verifying the effectiveness of HSE critical activities/tasks and equipment/systems against the established Performance Standards, by Drilling Contractor personnel not directly responsible for the MODU's/Rig's operations (may either be included or separate from the arrangements established in Audit and Compliance Audit above 4.2.5) and providing feedback to senior management.
- Establishing suitable arrangements for verifying the effectiveness of HSE critical activities/tasks and equipment/systems against the established Performance Standards, by personnel from a different organization (if applicable) and providing feedback to senior management.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- List of the HSE critical activities/tasks and equipment/systems. (See Drilling Contractor's Hazard Register and Drilling Contractor's Scope of Operations in Part 4).
- Details of the arrangements for verification of the effectiveness of all HSE critical activities/tasks and equipment/systems, against the established Performance Standards, by Drilling Contractor personnel not directly responsible for the MODU's/Rig's operations.
- Details of the arrangements for verification of the effectiveness of all HSE critical activities/tasks and equipment/systems, against the established Performance Standards, by personnel from a different organization (if applicable).
- Details of the arrangements for tracking actions arising from verification to completion.

Note: Where bridging documents address HSE critical activities, tasks or equipment or systems, arrangements for verification of the effectiveness these activities or tasks and equipment or systems should be included.

6.6 CERTIFICATION

Objective

To demonstrate that:

- The MODU/rig complies with Flag State requirements.
- The MODU/rig complies with classification requirements.
- The MODU/rig complies with Coastal State requirements.

How can this be achieved?

- Maintaining classification, Flag State, and Coastal State standards and requirements.

What in the Drilling Contractor's Management System demonstrates assurance to internal and external stakeholders that this objective can be achieved?

- List of HSE critical activities/tasks and equipment/systems in the management system are related to Regulatory, Flag State and Classification Society Requirements.
- Details on current status of MODU/Rig certification.