



Health, Safety and Environmental Case Guidelines for

LAND DRILLING UNITS





Health, Safety, and Environment Case Guidelines for Land Drilling Contractors

Issue 3.0

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Foreword

Over twelve years ago, our industry worked together to create and publish IADC's first HSE Case Guidelines for Land Drilling Units. A tremendous effort was invested in developing these guidelines, which in part had been inspired by a corresponding document developed for the offshore drilling industry.

At the time, we recognized a need to improve cooperation and alignment of requirements in the HSE field among drilling contractors, operators, suppliers, and national regulators. We also recognized a need for the requirements of drilling contractors to be more clearly addressed. The HSE Case Guidelines for Land Drilling Units made a significant contribution toward achieving these objectives.

Over the past decade, the HSE field of our industry has progressed toward refining HSE best practices, updating requirements, and developing smart regulations. These developments spurred IADC member companies to review and revise the guidelines where appropriate to align them with current legislation and good industry practices. In particular, risk management guidelines will continue to evolve.

A highly qualified working group, chaired by Mr. Dave Martin of Marriott Drilling, has made a tremendous effort to develop the revised guidelines. IADC is privileged to have supported such an engaged working group in seeing this important project to completion.

Jason McFarland, President

International Association of Drilling Contractors

Acknowledgements

IADC would like to thank the following organizations for their support and contribution to the development of these Guidelines:

Participants

Companies:

- PR Marriott Drilling Ltd
- Riskintl Ltd
- Egyptian Drilling Company
- WDI Drilling
- Ensign Energy
- Nabors
- Precision Drilling

IADC student chapter delegate from:

- Pandit Deendayal Energy University (PDEU), India
- Maharashtra Institute of Technology (MIT), India IADC

National Authorities

- Austrian Federal Ministry of Economics and Labour – Department of Energy and Mining (Bundesministerium für Wirtschaft und Arbeit - Energie und Bergbau)
- French Ministry of Economics, Finance and Industry – Directorate General of Energy and Raw Materials (Ministère de l'Économie, des Finances et de l'Industrie - Direction générale de l'énergie et des matières premières)
- German National Office for Mining Industry, Energy and Geology (Landesamt für Bergbau, Energie und Geologie)
- Hungarian Ministry of Economy and Transport – Mining Bureau of Hungary (A Hivatal a Gazdasági és Közlekedési Minisztérium - Magyar Bányászati Hivatal) Italian Ministry of Economic Development – National Mining Office for Hydrocarbons and Geothermal (Ministero dello Sviluppo Economico – Ufficio Nazionale Minerario per gli Idrocarburi e la Geotermia – F1) The Netherlands State Supervision of Mines (Staatstoezicht op de Mijnen)
- Polish State Mining Authority (Wyższy Urząd Górniczy)
- United Kingdom Health and Safety Executive

Industry Associations

- International Association of Oil and Gas Producers (IOGP) – Safety Committee

- Netherlands Energy Industry Association (Element NL)
- German Association of Natural Gas, Oil, and Geoenergy Companies (Bundesverband Erdgas, Erdöl und Geoenergie e.V. - BVEG)

Oil and Gas Companies

- Shell International Exploration and Production
- Petroleum Development Oman

Introduction to the IADC HSE Case Guidelines

Welcome

Welcome to the International Association of Drilling Contractors (IADC) Health, Safety, and Environmental (HSE) Case Guidelines. These Guidelines have been developed by IADC members to accomplish the following:

- Assist them in providing a demonstration to other interested parties (previously referred to as 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 National Regulators / other interested parties in reviewing Drilling Contractor's HSE Cases (where applicable) enabling Land Drilling Units / rigs to operate in different regulatory jurisdictions.
- Verify compliance with applicable regulatory and contractually agreed HSE requirements.
- Assist them in providing a demonstration to their external interested parties, where applicable, that their management system's risk reducing measures meet agreed- upon interested parties' expectations.

Throughout these Guidelines, reference is made to "other interested parties" or "external interested parties." These collective terms are used to identify that in many countries and regions, a variety of people, organizations, companies, and governmental agencies, individually or collectively, might have an interest or concern in the operational activities that may or are being undertaken by the Drilling Contractor.

These guidelines were developed for Drilling Contractors, and their scope of operations. Although the Guidelines are 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 recognized practices and standards, Drilling Contractors should develop their HSE Case based on their organization's methods of managing their scope of operations and business activities. By following the process outlined in these guidelines, users may demonstrate a high degree of HSE management assurance. This assurance, although acceptable to demonstrate the robustness of an organization's ability to manage HSE, it may not support all of the requirements for certification under ISO 9001, 14001, or ISO 45001:2018.

IADC trusts that Drilling Contractors will find these Guidelines 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 – "Updating the Guidelines").

Background

The oil and gas exploration and production arena is a diverse landscape of differing operating and business environments, some with national regulations, some without numerous authorities regulating a variety of aspects of onshore activities. Many Drilling Contractors find it challenging to satisfy the differing internal and external interested parties' 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 have seen the benefit of adopting and sharing a consistent harmonized 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 rig whilst in one country may be communicated to other relevant National authorities, subject to any legal restrictions. Thus, with an effective HSE Case, compliance to earlier commitments can be more effectively monitored when a rig moves across national boundaries.

Guidelines Application and Status

The Guidelines are intended to assist Drilling Contractors in preparing and reviewing HSE Cases that should provide themselves and the relevant national authorities / other interested parties with the assurance that their operations will comply with requirements and be conducted within tolerable limits of safe operations.

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

The Guidelines have been developed to address the requirements of the following entities:

- European Extractive Industries Directive (EID) 92/91/EEC as incorporated into Austrian, Danish, Dutch, German, Hungarian, Italian, and Polish legislation and detailed in Appendix D.
- European Framework Directive (FD) 89/391/EEC as incorporated into Austrian, Danish, Dutch, German, Hungarian, Italian, and Polish legislation and detailed in Appendix D.
- European National regulatory requirements, which are also detailed in Appendix D.
- ISO 45001:2018 - International occupational health and safety management system, as detailed in Appendix D.
- Offshore Safety Directive (European Union), where applicable.

With regard to the title of the document, many regimes use a different term. For consistency, these guidelines are referred to as the Health, Safety, and Environmental (HSE) Case Guidelines in order to reflect the following:

- Trends towards integrating the management of health, safety, and environment.
- Requirements of many National Authorities / clients that address environment in the same way as health and safety.

When developing an HSE Case based on these guidelines, care should be taken to ensure that it reflects the relevant regulatory requirements / client expectations as well as the operating culture of the country / region it is being developed for. Before developing an HSE Case for a specific country / region, it is recommended that Drilling Contractors consult with the relevant regulatory agencies and their clients / other interested parties. This will ensure a common understanding of what is required and how it should be presented.

Development and Presentation

As per the Guidelines, HSE Cases are not necessarily required to be presented in a standard format. However, the Guidelines' structure lends itself to be adopted as a template, widely 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 Guidelines.

Where electronic presentation of information is being considered, it is essential that details are discussed and agreed with clients and regulators, prior to presentation.

HSE Case Submission to National Authorities

When submitting an HSE Case to a National Authority, 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. Drilling Contractors may also find value in providing their clients with a similar letter.

Structure and Content of these Guidelines

The Guidelines have been developed in six parts.

- Part 1: HSE Case Introduction (a general overview of the HSE Case process)
- Part 2: Drilling Contractor's Management System – (HSE Management)
- Part 3: Rig Description and Supporting Information
- Part 4: Risk Management
- Part 5: Emergency Response
- Part 6: Performance Monitoring

Appendices:

- Appendix A: Reference Documents
- Appendix B: Abbreviations and Definitions
- Appendix C: Drawings and Schematics
- Appendix D: National Regulatory Index

Assessment and Acceptance

Each Drilling Contractor, Country and client may have their 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 national authority at the outset.

Abbreviations, Acronyms, and Definitions

Throughout these guidelines various abbreviations and acronyms have been used. An explanation of these can be found in Appendix B. Likewise, to ensure consistency in approach and understanding, IADC has adopted definitions for a number of specific terms that have been drawn from ISO standards. The IADC lexicon can be accessed via the IADC website as an additional resource at www.iadc.org.

Updating the Guidelines

Having developed these Guidelines, IADC wishes to further develop and maintain it so that it remains a useful and respected source of information.

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

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1.0.1	Administrative update	27 July 2009
2.0	Fully updated	1 March 2022

Part 1: Introduction and Expectations

1.0 Introduction to these Guidelines

Drilling contractors have historically managed Health, Safety, Environment (HSE) and operational risks. During the last few decades, many Drilling Contractors recognized that in order to achieve a step-change improvement in Health, Safety, Environmental 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 HSE 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.

To further improve the efficiency and effectiveness of business results, many Drilling Contractors have integrated the management of HSE risks into their core business activities.

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. Where applicable: demonstrate to other interested and concerned parties, that the risk reducing controls in the Drilling Contractor's management system meet their expectations too.

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.

These Guidelines contain five key 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: HSE Management Assurance).

- **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**—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 others. 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 Part 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 those regulatory regimes outlined in Appendix D.

- **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.

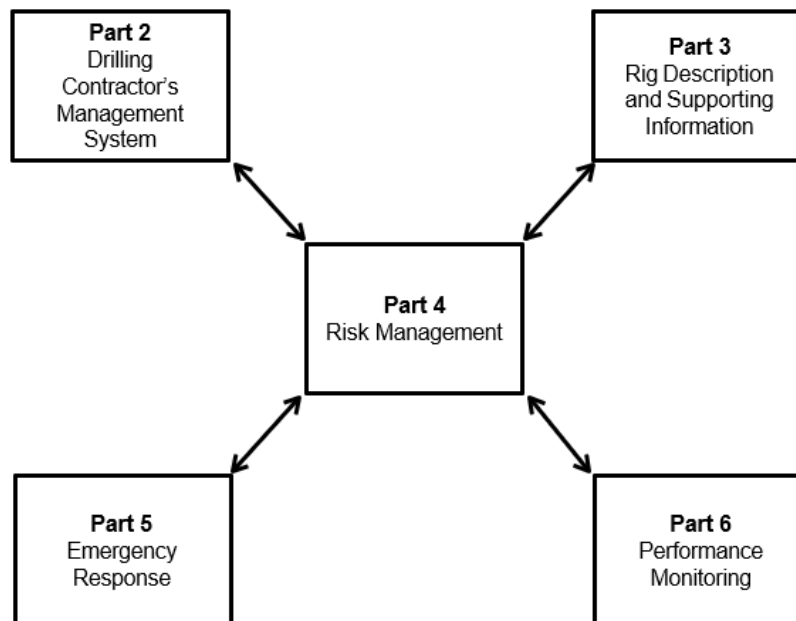


Figure 1: HSE Management Assurance

To provide assurance that a Drilling Contractor is managing HSE effectively, Part 2, Part 3, Part 5, and Part 6 must 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 as follows:

- 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 Part 2 and Part 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.

2.0 HSE Case Expectations for External Interested Parties

While these Guidelines firstly address internal assurance for the Drilling Contractor, they also include assurances that may be expected by others. These HSE Case expectations include arrangements that 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.

2.1 Senior Management Demonstration

- For the Drilling Contractor’s senior management to demonstrate the following:
 - Established HSE management within their business activities.
 - Established measures against all identified HSE risks.
 - Assurance that the rig complies with all mandatory rules and regulations.

What in the Drilling Contractor’s Management System demonstrates assurance to others that these expectations are achieved?

- A completed HSE Case that provides 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 meet its senior management’s expectations.
- A completed HSE Case that assures others that the Drilling Contractor’s management system’s risk reducing controls meet agreed expectations.

2.2 HSE Case Scope and Arrangements

Expectations of others:

- 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 others 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.

2.3 Drilling Contractor Overview

Expectations of others:

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

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

- Brief summary of the Drilling Contractor's organization 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.

2.4 HSE Case Responsibilities

Expectations of others:

Description of the Drilling Contractor's organizational, 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 others that these expectations are achieved?

- Identification of position(s) in the organization 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.

2.5 HSE Case Reviews and Updates

Expectations of others:

- 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 organizational 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 others 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.

2.6 Continuous Improvement

Expectations of others:

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

What in the Drilling Contractor's Management System demonstrates assurance to others 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 legislation and regulations and implementing necessary changes within their management system.

2.7 Action Plan / Recommendations

Expectations of others:

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 others 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.

2.8 HSE Case Presentation

Expectations of others:

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

What in the Drilling Contractor's Management System demonstrates assurance to others 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.

2.9 Regulatory Requirements

Expectations of others:

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

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

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

2.10 HSE Management

Expectations of others:

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

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

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

2.11 Environmental Impact and Aspect Assessments

Expectations of others:

- To provide confirmation that the Drilling Contractor has systematically:
 - Identified and assessed all environmental impacts and aspects associated with 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 others that these expectations are achieved?

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

2.12 Justification for Continued Operation

Expectations of others:

- 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 others that these expectations are achieved?

- Commitment to operate the rig 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.
 - Company objectives.
- A statement of the senior management commitment to operate the rig in accordance with the conclusions from the HSE Case.

Part 2: Drilling Contractor's Management System – HSE Management

3.0 Introduction

3.1 Objectives of a Health, Safety, and Environmental Management System

The objective of a Health, Safety, and Environmental Management System (HSEMS) is to provide a framework for managing HSEMS risks and opportunities. The objective and intended outcomes of the HSEMS are to prevent work-related injury and ill health to workers and to provide safe, healthy workplaces with minimum risk to the environment. Consequently, it is critically important for the Drilling Contractor to eliminate hazards and minimize HSEMS risks by taking effective preventive and protective measures.

These measures if applied by the Drilling Contractor through its HSEMS, can improve its HSEMS performance. An HSEMS can be more effective and efficient when taking early action to address opportunities for improvement of HSEMS performance. Implementing an HSEMS conforming to this guidance document enables a Drilling Contractor to manage its HSEMS risks, improve its HSEMS performance and can assist a Drilling Contractor to fulfil its legal requirements and other requirements.

IADC acknowledges that drilling contractors typically employ the following management systems. In this document, the terms HSEMS and OHSEMS are used interchangeably.

Health, Safety, and Environmental Management System (HSEMS) is defined as the following:

- A structured framework comprising company responsibilities, practices, procedures, processes, and resources to implement health, safety, and environmental management.
- *Source: IADC Lexicon, IOGP Report No. 6.36/210, Guidelines for the Development and Application of Health, Safety and Environmental Management Systems (International Association of Oil & Gas Producers, July 1994).*

Occupational Health, Safety, and Environmental Management System (OHSEMS) is defined as the following:

A system designed to:

- Prevent work-related injuries and illnesses.
- Protect and improve worker health.
- Enhance working conditions and the surrounding environment.
- Uphold the right to a safe and healthy working environment.

In the upstream oil and gas industry, safety management systems may include (but are not limited to):

- **Advanced Warning:** Tools such as weather reporting, seismic surveys, sensors, and GNSS/GPS-based shipping visibility systems.

- **Tracking Systems:** Real-time information about personnel onsite.
- **Equipment Monitoring:** IoT-enabled monitoring for real-time equipment status updates.
- **Automated Safety:** Sensor-based systems like fire doors, automated valve shutoffs, and self-sealing pipes.
- **Communication Technology:** Onsite devices for rapid communication.
- **Industry Standards and Recommended Practices:**
 - *ISO 45001:2018 Occupational Health and Safety Management Standard replaced OHSAS 18001:2007 in 2018, emphasizing occupational health.*
 - *ISO 14001:2015 Environmental Management Standard is the current benchmark for environmental management.*

Additionally, companies may develop their own in-house management systems to meet specific operational needs.

3.2 Success Factors

The implementation of an OHSEMS is a strategic and operational decision for a Drilling Contractor and its success depends on leadership, commitment and participation from all levels and functions of the Drilling Contractor's organization.

The implementation and maintenance of an OHSEMS, its effectiveness, and its ability to achieve its intended outcomes are dependent on a number of key factors, which can include the following:

- Senior Management leadership, commitment, responsibilities, and accountability.
- Senior Management developing, leading, and promoting a culture in the organization that supports the intended outcomes of the OHSEMS.
- Communication.
- Consultation and participation of workers, and, where they exist, workers' representatives.
- Allocation of the necessary resources to maintain it.
- OHSEMS policies, which are compatible with the overall strategic objectives and direction of the Drilling Contractor
- Effective process(es) for identifying hazards, controlling OHSEMS risks and taking advantage of OHSEMS opportunities.
- Continual performance evaluation and monitoring of the OHSEMS to improve OHSEMS performance.
- Integration of the OHSEMS into the Drilling Contractor's business processes.
- OHSEMS objectives that align with the OHSEMS policy and take into account the Drilling Contractor's hazards, OHSEMS risks, and OHSEMS opportunities.
- Compliance with its legal requirements and other requirements.

Demonstration of successful implementation of this guidance can be used by a Drilling Contractor to give assurance to workers and other interested parties that an effective OHSEMS system is in place. Adoption of this guidance, however, will not in itself guarantee prevention of work-related injury and ill health to workers, provision of safe and healthy workplaces and improved OHSEMS performance.

The level of detail, the complexity, the extent of documented information and the resources needed to ensure the success of a Drilling Contractor's OHSEMS will depend on a number of factors, such as:

- The Drilling Contractor's context (e.g., number of workers, size, geography, culture, legal requirements, and other requirements).
- The scope of the Drilling Contractor's OHSEMS.
- The nature of the Drilling Contractor's activities and the related OHSEMS risks.

3.3 Summary of Part 2

Part 2 describes the Drilling Contractor's OHSEMS 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.

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

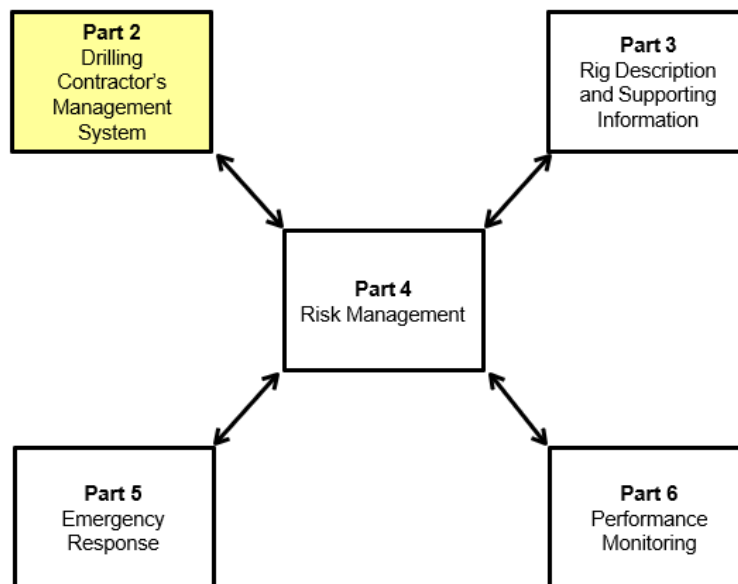


Figure 2: HSE Management Assurance

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 organization are directed, planned, conducted, and controlled in such a way as to provide assurance that the objectives of the organization 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.

3.4 Plan-Do-Check-Act Cycle

Current International Standards (ISOs) base their OHSEMS approach on the concept of Plan-Do-Check-Act (PDCA). The PDCA concept can be used by Drilling Contractors to achieve continual improvement. It can be applied to a management system and to each of its individual elements, as follows:

- **Plan:** Determine and assess OHSEMS risks, OHSEMS opportunities and other risks and other opportunities, establish OHSEMS objectives and processes necessary to deliver results in accordance with the Drilling Contractor's OHSEMS policy.
- **Do:** Implement the processes as planned.
- **Check:** Monitor and measure activities and processes with regard to the OHSEMS policy and OHSEMS objectives, and report the results.
- **Act:** Take actions to continually improve the OHSEMS performance to achieve the intended outcomes.

Part 2 incorporates the PDCA concept together with the main OHSEMS elements as shown in Figure 3: ISO 45001:2018 Occupational Health & Safety Management System Model and Figure 4: ISO 14001:2015 Environmental Management System Model.

3.5 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 ISO 45001:2018 and ISO 14001:2015.

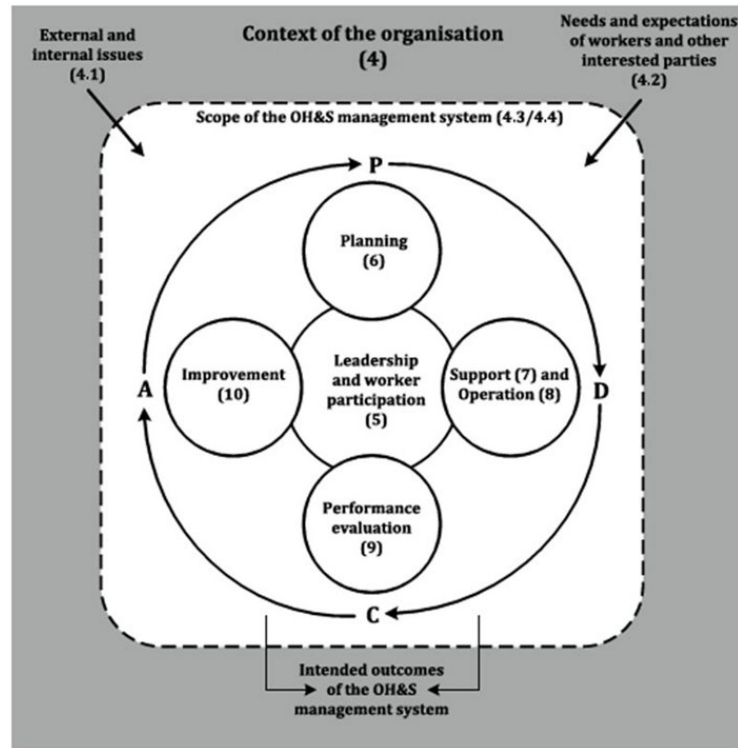


Figure 3: ISO 45001:2018 Occupational Health & Safety Management System Model

Above figure courtesy of: BSI Standards Publication Occupational health and safety management systems Requirements with guidance for use ...making excellence a habit.™

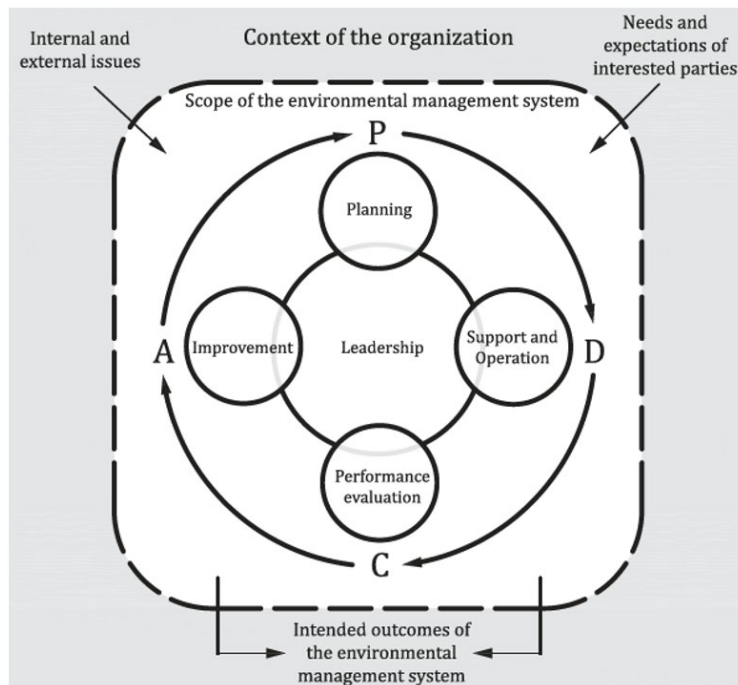


Figure 4: ISO 14001:2015 Environmental Management System Model

Above figure courtesy of: BSI Standards Publication Occupational health and safety management systems Requirements with guidance for use ...making excellence a habit.™

4.0 Environmental, Social, Governance (ESG)

In keeping with our member companies and industry, IADC has a strong commitment toward environmental, social, and governmental (ESG) issues. At the core of this commitment is an imperative to promote the highest industry safety standards, environmental integrity, and operational efficiency.

The current document does not aspire to cover the fast development of the many ESG issues. However, the strong link between the ESG and HSE fields makes it important that users of this document stay abreast of evolving company and industry standards in the ESG field.

5.0 Occupational Health, Safety, and Environmental Standards

Various OHSEMS standards can be implemented by Drilling Contractor. These include standards such as the following:

- ISO 45001:2018 Occupational Health and Safety Management Standard
- ISO 14001:2015 Environmental Management Standard
- API RP 54 Occupational Safety and Health for Oil and Gas Well Drilling and Servicing Operations
- API RP 52 Land Drilling Practices for Protection of the Environment

ISO 45001:2018 was specifically developed to be compatible with ISO 14001:2015 Environmental Management Systems Standard and ISO 9001:2015 Quality Management Systems Standard. This compatibility allows Drilling Contractors to develop an integrated Health, Safety, and Environmental Management System. Drilling Contractors who combine the management of Health, Safety, and Environment may find it advantageous to base their management systems on ISO 45001:2018 to avoid separate (and redundant) Health, Safety, and Environmental management programs.

Part 2 is based on ISO 45001:2018 and ISO 14001:2015 as applicable to Land Drilling Operations.

5.1 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 organization, no matter how they are arranged or grouped:

- Human Resources
- Training
- Operations
- Procurement
- Maintenance
- Engineering

- Finance
- Marketing
- Occupational Health, Safety, and Environmental Management (OHSEM)

The main elements included in the OHSEMS are shown in the following figures:

- Figure 3: ISO 45001:2018 Occupational Health & Safety Management System Model.
- Figure 4: ISO 14001:2015 Environmental Management System Model.

OHSEMS Management should be seen as a Core Business Function of a Drilling Contractor's management system because successful HSE Management should be integrated into the Core Business Functions. (See Figure 3.)

The HSE Case demonstrates that risks associated with major and other workplace hazards have been 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 Occupational Health and Safety Management (OHSM) should be used in place of (OHSEMS). Refer to Part 4 – Risk Management - for a more complete discussion about integrating OHSEMS Management into Drilling Contractor's scope of operations.

The Land Drilling 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 interested parties 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 clients' third-party contractors to align with Senior Management aspirations for safe operations on the rig, is 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.

5.2 Demonstrating Assurance of HSE Management Objectives

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

Part 2, Part 3, and Part 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 can do either of the following:

- Demonstrate assurance that HSE management objectives are being met.
- Identify 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 organized within the ISO Management System Elements Structure (Figure 2), 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.

6.0 Understanding the Context and Scope of the Drilling Contractor

Drilling Contractors should understand the context and scope of their organization by determining the external and internal issues that are relevant to its scope of operation that affect its ability to achieve the intended outcomes of its OHSEMS. Such issues include safety, health, environmental and quality conditions being affected by or capable of affecting the Drilling Contractors operations.

6.1 Context of the Drilling Contractors Operations

Objective

To establish the context of the organization the Drilling Contractor should understand the external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended outcome(s) of its OHSEMS.

How can this be achieved?

This requires understanding the needs and expectations of workers and other interested parties that are relevant to the OHSEMS and which of these needs and expectations are, or could become, legal requirements and other requirements.

Interested parties include the workforce, clients, regulatory bodies, industry standards, local communities, suppliers, neighbors.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Internal and External Issues Register
- Interested Parties Register

6.2 Scope of the Drilling Contractors Operations

Objective

To determine the scope of the OHSEMS relevant the Drilling Contractors Operations.

How can this be achieved?

- Drilling contractors must understand the boundaries and applicability of their OHSEMS in order to establish its scope. This requires:
 - The understanding of the needs and expectations of workers and other interested parties
 - The understanding of the external and internal issues relevant to the organization, taking into account the planned or performed work-related activities.
- The OHSEMS should include the activities, products and services within the Drilling Contractor's control or influence that can impact their OHSEMS performance.
- The scope should be available as documented information.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Internal and External Issues Register
- Interested Parties Register

7.0 Leadership and Worker Participation

7.1 Leadership and Commitment

Objective

In order to operate an effective OHSEMS Senior Management must lead by example and demonstrate leadership and commitment with respect to the OHSEMS.

How can this be achieved?

- Taking overall responsibility and accountability for the prevention of work-related injury and ill health, as well as the provision of safe and healthy workplaces and activities.
- Ensuring that the OHSEMS policy and related OHSEMS objectives are established and are compatible with the strategic direction of the Drilling Contractor.
- Ensuring the integration of the OHSEMS requirements into the Drilling Contractor's business processes.
- Ensuring that the resources needed to establish, implement, maintain, and improve the OHSEMS are available.
- Communicating the importance of effective OHSEMS management and of conforming to the OHSEMS requirements.
- Ensuring that the OHSEMS achieves its intended outcome(s).

- Directing and supporting persons to contribute to the effectiveness of the OHSEMS.
- Ensuring and promoting continual improvement.
- Supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility.
- Developing, leading, and promoting a culture in the Drilling Contractor that supports the intended outcomes of the OHSEMS.
- Protecting workers from reprisals when reporting incidents, hazards, risks, and opportunities.
- Ensuring the Drilling Contractor establishes and implements a process(es) for consultation and participation of workers.
- Supporting the establishment and functioning of health and safety committees

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Senior Drilling Contractor Management demonstrating leadership and commitment by leading by example.

7.2 Workforce Engagement

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?

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

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

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

7.3 Senior Management Responsibility

Objective

To demonstrate senior management has established integrated HSE management responsibilities for the organization'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 others 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.

7.4 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 others that this objective can be achieved?

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

7.5 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 others that this objective can be achieved?

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

7.6 HSE Committee or Worker 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 others 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.

7.7 OHSEMS Policy

Objective

To demonstrate that senior management have established, implemented, and maintain an OHSEMS policy that details 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.
- Including a commitment to provide safe and healthy working conditions for the prevention of work-related injury and ill health and is appropriate to the purpose, size and context of the Drilling Contractor and to the specific nature of its OHSEMS risks and OHSEMS opportunities.

Providing a Framework for Setting the OHSEMS Objectives

- Including a commitment to fulfill legal requirements and other requirements.
- Including a commitment to eliminate hazards and reduce OHSEMS risks.
- Including a commitment to continual improvement of the OHSEMS.
- Including a commitment to consultation and participation of workers, and, where they exist, workers' representatives.

What in the Drilling Contractor's Management System demonstrates assurance to others 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.
- Policies available as documented information.
- Policies communicated within the Drilling Contractor.
- Policies made available to interested parties, as appropriate policies made relevant and appropriate.

8.0 Organizational Roles, Responsibilities, and Authorities

8.1 Organization

The Drilling Contractor Senior Management should ensure that the responsibilities and authorities for relevant roles within the OHSEMS are assigned and communicated at all levels within the Drilling Contractor and maintained as documented information. Workers at each level of the organization should assume responsibility for those aspects of the OHSEMS over which they have control.

Objective

- To demonstrate that there is an organizational 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 interested parties are defined.

How can this be achieved?

- Having a clearly defined organizational structure.
- Defining and assigning HSE responsibilities to positions within the organization.
- By creating a bridging document describing individual and collective interested party 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 others that this objective can be achieved?

- Organization 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 organizational positions.

- Processes 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 organizational structure and allocation of resources.
- In order to operate an effective OHSEMS Senior Management must lead by example and demonstrate leadership and commitment with respect to the OHSEMS. This can be achieved by Senior Management.



NOTE: While responsibility and authority can be assigned, senior management is still accountable for the functioning of the OHSEMS.

Top management should assign the responsibility and authority for the following:

- Ensuring that the OHSEMS conforms to the requirements of this document.
- Reporting on the performance of the OHSEMS to senior management.

8.2 Consultation and Participation of Workers

Objective

The Drilling Contractor will need to establish, implement, and maintain a process(es) for consultation and participation of workers at all applicable levels and functions, and, where they exist, workers' representatives, in the development, planning, implementation, performance evaluation and actions for improvement of the OHSEMS.

How can this be achieved?

- Providing mechanisms, time, training, and resources necessary for consultation and participation.
- Providing timely access to clear, understandable, and relevant information about the OHSEMS.
- Determining and removing obstacles or barriers to participation and minimize those that cannot be removed.
- Emphasizing the consultation of non-managerial workers on the following:
 - Determining the needs and expectations of interested parties.
 - Establishing the OHSEMS policy.
 - Assigning organizational roles, responsibilities, and authorities, as applicable.
 - Determining how to fulfil legal requirements and other requirements.
 - Establishing OHSEMS objectives and planning to achieve them.
 - Determining applicable controls for outsourcing, procurement, and contractors.
 - Determining what needs to be monitored, measured, and evaluated.

- Planning, establishing, implementing, and maintaining an audit program.
- Ensuring continual improvement.
- Emphasizing the participation of non-managerial workers in the following:
 - Determining the mechanisms for their consultation and participation.
 - Identifying hazards and assessing risks and opportunities.
 - Determining actions to eliminate hazards and reduce OHSEMS risks.
 - Determining competence requirements, training needs, training and evaluating training.
 - Determining what needs to be communicated and how this will be done.
 - Determining control measures and their effective implementation and use.
 - Investigating incidents and nonconformities and determining corrective actions.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- OHSEMS and operational meeting schedules (pre-shift, daily, weekly, monthly, quarterly)
- HSE/Worker representatives and workforce engagement

9.0 Planning

9.1 Actions to Address Risks and Opportunities

Objective

When planning for the OHSEMS, the Drilling Contractor must consider the issues referred to in the context and scope of the organization, interested parties and the scope of its OHSEMS and determine the risks and opportunities that need to be addressed.

How can this be achieved?

- Giving assurance that the OHSEMS can achieve its intended outcome(s).
- Preventing, or reducing, undesired effects.
- Achieving continual improvement.
- When determining the risks and opportunities for the OHSEMS and its intended outcomes that need to be addressed, the Drilling Contractor should take into account:
 - Hazards
 - OHSEMS risks and other risks
 - OHSEMS opportunities and other opportunities
 - Legal requirements and other requirements
- In its planning process(es), the Drilling Contractor should determine and assess the risks and opportunities that are relevant to the intended outcomes of the OHSEMS associated with

changes in the organization, its processes or the OHSEMS. In the case of planned changes, permanent or temporary, this assessment should be undertaken before the change is implemented. The Drilling Contractor should maintain documented information on the following:

- Risks and opportunities.
- The process(es) and actions needed to determine and address its risks and opportunities to the extent necessary to have confidence that they are carried out as planned.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Internal and External Issues register
- Risk and Opportunity register

9.2 Planning and Risk Management

Objective

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

How can this be achieved?

- Implementing a task plan, with an appropriate level of risk assessment, is developed for all work activities.
- Monitoring the work activities to ensure they are planned, and risk assessed and that the plans are followed.
- Developing and implementing rig-specific procedures that enable the organization or 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 others 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.

9.3 Hazard Identification and Assessment of Risks and Opportunities

Objective

The Drilling Contractor will need to establish, implement, and maintain a process(es) for hazard identification that are ongoing and proactive.

How can this be achieved?

The process(es) should take into account, but not be limited to, the following:

- How work is organized, social factors (including workload, work hours, victimization, harassment, and bullying), leadership, and the culture in the organization.
- Routine and non-routine activities and situations, including hazards arising from the following:
 - Infrastructure, equipment, materials, substances, and the physical conditions of the workplace.
 - Product and service design, research, development, testing, production, assembly, construction, service delivery, maintenance and disposal, human factors.
 - How the work is performed.
- Past relevant incidents, internal or external to the organization, including emergencies and their causes.
- Potential emergency situations.
- People, including consideration of the following:
 - Those with access to the workplace and their activities, including workers, contractors, visitors, and other persons.
 - Those in the vicinity of the workplace who can be affected by the activities of the organization.
 - Workers at a location not under the direct control of the Drilling Contractor.
- Other issues, including consideration of the following:
 - The design of work areas, processes, installations, machinery / equipment, operating procedures, and work organization, including their adaptation to the needs and capabilities of the workers involved.
 - Situations occurring in the vicinity of the workplace caused by work-related activities under the control of the drilling contractor.
 - Situations not controlled by the drilling contractor and occurring in the vicinity of the workplace that can cause injury and ill health to persons in the workplace.
 - Actual or proposed changes in Drilling Contractor, operations, processes, activities, and the OHSEMS.
 - Changes in knowledge of, and information about, hazards.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

For more information on this topic, please see Part 4 (Risk Management).

- Documented processes to carry out Hazard Identification and Assessment of Risks and Opportunities.
- Documented evidence of Hazard Identification and Assessment of Risks and Opportunities.

- 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.

9.4 Assessment of Risks to the OHSEMS

Objective

The Drilling Contractor should establish, implement, and maintain a process(es) to:

- Assess OHSEMS risks from the identified hazards, while taking into account the effectiveness of existing controls.
- Determine and assess the other risks related to the establishment, implementation, operation, and maintenance of the OHSEMS.

How can this be achieved?

The Drilling Contractors methodology(ies) and criteria for the assessment of OHSEMS risks should be defined with respect to their scope, nature, and timing to ensure they are proactive rather than reactive and are used in a systematic way. Documented information should be maintained and retained on the methodology(ies) and criteria.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

The Drilling Contractor should establish, implement, and maintain a process(es) to assess:

- OHSEMS opportunities to enhance OHSEMS performance, while taking into account planned changes to the organization, its policies, its processes, or its activities, as well as the following:
 - Opportunities to adapt work, work organization, and work environment to workers.
 - Opportunities to eliminate hazards and reduce OHSEMS risks.
 - Other opportunities for improving the OHSEMS.

9.5 Determination of Legal and other Requirements

Objective

To determine legal (statutory requirements) and other requirements (voluntary) within the scope of the Drilling Contractor and to demonstrate that relevant regulatory requirements are complied with.

How can this be achieved?

- The Drilling Contractor should establish, implement, and maintain a process(es) to:
 - Determine and have access to up-to-date legal and related requirements that are applicable to OHSEMS risks.
 - Determine how these legal requirements and other requirements apply to the Drilling Contractor and what needs to be communicated.
 - Take these legal requirements and other requirements into account when establishing, implementing, maintaining, and continually improving its OHSEMS.

- Maintain and retain documented information on its legal requirements and other requirements and should ensure that it is updated to reflect any changes.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Development of a Legal and Voluntary Compliance Register.
- The arrangements and responsibilities for providing adequate resources for HSE management activities.

9.6 Planning Actions

Objective

- The Drilling Contractor should plan actions to accomplish the following:
 - Address risks and opportunities.
 - Address legal requirements and other requirements.
 - Prepare for and respond to emergency situations.
- Methods:
 - Integrate and implement the actions into its OHSEMS processes or other.
 - Develop business processes.
 - Evaluate the effectiveness of these actions.

How can this be achieved?

- The Drilling Contractor should take into account the hierarchy of controls and outputs from the OHSEMS when planning to take action.
- When planning its actions, the Drilling Contractor should consider best practices; technological options; and financial, operational, and business requirements.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Risks and Opportunities Register
- Legal Register
- Emergency Response Plans/Procedures

9.7 OHSEMS Objectives and Planning to Achieve Them

Objective

- The Drilling Contractor should establish OHSEMS objectives at relevant functions and levels in order to maintain and continually improve the OHSEMS and OHSEMS performance.

How can this be achieved?

- The OHSEMS objectives should:
 - Be consistent with the OHSEMS policy.
 - Be measurable (if practicable) or capable of performance evaluation.
- Take into account:
 - Applicable requirements.
 - The results of the assessment of risks and opportunities.
 - The results of consultation with workers (see Details of Emergency Equipment in Part 5) and, where they exist, workers' representatives.
- Be monitored.
- Be communicated.
- Be updated as appropriate.
- Develop strategic HSE management objectives and cascading them through the organization.
- Maintain annual HSE programs and plans that show how HSE management objectives are to be achieved.

What in the Drilling Contractor's Management System demonstrates assurance to others 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 organization.

When planning how to achieve its OHSEMS objectives, the Drilling Contractor should determine:

- What will be done.
- What resources will be required.
- Who will be responsible.
- When it will be completed.
- How the results will be evaluated, including indicators for monitoring.
- How the actions to achieve OHSEMS objectives will be integrated into the Drilling Contractors business processes.

The Drilling Contractor should maintain and retain documented information on the OHSEMS objectives and plans to achieve them.

10.0 OHSEMS Support

The Drilling Contractor should determine and provide the resources needed for the establishment, implementation, maintenance, and continual improvement of the OHSEMS.

Objective

To demonstrate that there is a support organization 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.
- Assigning knowledgeable and experienced individuals to conduct 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 others that this objective can be achieved?

- Description of the support organization and the arrangements to provide the necessary resources to meet the HSE management objectives.
- The arrangements and responsibilities for providing adequate resources for HSE management activities.

11.0 Competence Resources

11.1 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 others that this objective can be achieved?

- Details of positions that have HSE critical activity responsibilities, e.g., Rig Manager, ToolPusher, Driller, 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.

11.2 Selection of Sub-Contractor Personnel

Objective

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

How can this be achieved?

- By applying the same selection process to the selection of sub-contractor staff assigned to positions with HSE critical/hazardous activity responsibilities.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

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

11.3 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 behavior-based observation systems.

What in the Drilling Contractor's Management System demonstrates assurance to others 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 behavior-based observation systems.

11.4 Training

Objective

To demonstrate that personnel are 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 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 others 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.

11.5 Induction Program

Objective

To demonstrate that there is a structured induction program 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 program.

- Providing induction programs for new personnel and for existing employees that change locations or job functions.
- Developing induction programs 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 others that this objective can be achieved?

- Details of the induction program for all new employees and transferees.
- Arrangements for refresher training for existing employees.
- The Drilling Contractor should:
 - Determine the necessary competence of workers that affects or can affect its OHSEMS performance.
 - Ensure that workers are competent (including the ability to identify hazards) on the basis of appropriate education, training or experience.
 - Where applicable, take actions to acquire and maintain the necessary competence, and evaluate the effectiveness of the actions taken.
 - Retain appropriate documented information as evidence of competence.

11.6 Awareness

Workers (including drilling contractors, etc.) should be made aware of the following:

- The OHSEMS policy and OHSEMS objectives.
- Their contribution to the effectiveness of the OHSEMS, including the benefits of improved OHSEMS performance.
- The implications and potential consequences of not conforming to the OHSEMS requirements.
- Incidents and the outcomes of investigations that are relevant to them.
- Hazards, OHSEMS risks, and actions determined that are relevant to them.
- The ability to remove themselves from work situations that they consider present an imminent and serious danger to their life or health, as well as the arrangements for protecting them from undue consequences for doing so.

12.0 Communication

Objective

To demonstrate that there is a suitable communication structure for disseminating HSE information throughout the organization.

How can this be achieved?

- The Drilling Contractor should establish, implement, and maintain the process(es) needed for the internal and external communications relevant to the OHSEMS, including determining the following:
 - On what it will communicate.
 - When to communicate.
 - With whom to communicate:
 - Internally among the various levels and functions of the organization.
 - Among contractors and visitors to the workplace.
 - Among other interested parties.
 - How to communicate.
- The Drilling Contractor should take into account diversity aspects (e.g., gender, language, culture, literacy, disability) when considering its communication needs and should ensure that the views of external interested parties are considered in establishing its communication process(es).
- When establishing its communication process(es), the Drilling Contractor should:
 - Take into account its legal requirements and other requirements.
 - Ensure that OHSEMS information to be communicated is consistent, with information generated within the OHSEMS, and is reliable.
- The Drilling Contractor should respond to relevant communications on its OHSEMS and should retain documented information as evidence of its communications, as appropriate.
- Establishing an HSE communication structure for sharing HSE information company wide.

12.1 Internal Communication

The Drilling Contractor should use the following guidelines for communicating internally:

- Internally communicate information relevant to the OHSEMS among the various levels and functions of the organization, including changes to the OHSEMS, as appropriate.
- Ensure its communication process(es) enables workers to contribute to continual improvement.

12.2 External Communication

The Drilling Contractor should use the following guideline for communicating externally:

- Externally communicate information relevant to the OHSEMS, as established by the Drilling Contractors communication process(es), while taking into account its legal requirements and other requirements.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

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

12.3 Safety/HSE Alerts and Bulletins

Objective

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

How can this be achieved?

- Establishing arrangements for sourcing Safety/HSE Alerts and Bulletins.
- Establishing arrangements for distributing Safety/HSE Alerts and Bulletins.
- Establishing arrangements for ensuring actions in Safety/HSE Alerts and Bulletins are followed up and closed out.
- Sharing relevant Safety/HSE Alerts and Bulletins and other information with others.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Arrangements for sourcing, issuing, responding, and acting to Safety/HSE Alerts and Bulletins.

13.0 Documented Information

Objective

To demonstrate effective document control and control of records and that relevant, accurate and up to date HSE documentation is readily accessible.

How can this be achieved?

- The Drilling Contractors OHSEMS should include the following:
 - Documented information required by the relevant standards.
 - Documented information determined by the Drilling Contractor as being necessary for the effectiveness of the OHSEMS.
- The extent of documented information for an OHSEMS can differ from one Drilling Contractor to another due to the following:
 - The size of organization and its type of activities, processes, products, and services.
 - The need to demonstrate fulfilment of legal requirements and other requirements.
 - The complexity of processes and their interactions.
 - The competence of workers.

13.1 Creating and Updating

When creating and updating documented information, the Drilling Contractor should ensure the following:

- 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.
- Identification and description (e.g., a title, date, author, or reference number).
- Format (e.g., language, software version, graphics) and media (e.g., paper, electronic).
- Review and approval for suitability and adequacy.

13.2 Control of Documented Information

Documented information required by the OHSEMS and by this document should be controlled to ensure:

- It is available and suitable for use, where and when it is needed.
- It is protected (e.g., from loss of confidentiality, improper use, or loss of integrity).

For the control of documented information, the Drilling Contractor should address the following activities, as applicable:

- Distribution, access, retrieval, and use.
- Storage and preservation, including preservation of legibility.
- Control of changes (e.g., version control).
- Retention and disposition.

Documented information of external origin determined by the Drilling Contractor to be necessary for the planning and operation of the OHSEMS should be identified, as appropriate, and controlled.

What in the Drilling Contractor's Management System demonstrates assurance to others 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 organization, 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.

14.0 Operation

14.1 Operational Planning and Control

Objective

The Drilling Contractor should plan, implement, control and maintain the processes needed to meet requirements of the OHSEMS, and to implement the actions determined by hazard identification and assessment of risks and opportunities.

How can this be achieved?

- Establishing criteria for the processes.
- Implementing control of the processes in accordance with the criteria.
- Maintaining and retaining documented information to the extent necessary to have confidence that the processes have been carried out as planned.
- Adapting work to workers.

At multi-employer workplaces, the Drilling Contractor should coordinate the relevant parts of the OHSEMS with the other organizations.

14.2 Eliminating Hazards and Reducing OHSEMS Risks

The Drilling Contractor should establish, implement, and maintain a process(es) for the elimination of hazards and reduction of OHSEMS risks using the following hierarchy of controls:

- Eliminate the hazard.
- Substitute with less hazardous processes, operations, materials, or equipment.
- Use engineering controls and reorganization of work.
- Use administrative controls, including training.
- Use adequate personal protective equipment.

What in the Drilling Contractor's Management System demonstrates assurance to others 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.

15.0 Management of Change

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

Objective

The Drilling Contractor should establish a process(es) for the implementation and control of planned temporary and permanent changes that impact OHSEMS performance to demonstrate HSE implications associated with changes in organization, 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.
- Ensuring that the following products, services, and processes, or changes to existing products, services, and processes, are included in the Management of Change process:
 - Workplace locations and surroundings
 - Work organization
 - Working conditions
 - Equipment
 - Work force
 - Changes to legal requirements and other requirements
 - Changes in knowledge or information about hazards and OHSEMS risks
 - Developments in knowledge and technology

The Drilling Contractor should review the consequences of unintended changes, taking action to mitigate any adverse effects, as necessary.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Description of the change management procedures.

16.0 Procurement

Objective

The Drilling Contractor should establish, implement, and maintain a process(es) to control the procurement of products and services in order to ensure their conformity to its OHSEMS.

How can this be achieved?

16.1 Contractors

The Drilling Contractor should coordinate its procurement process(es) with its contractors, in order to identify hazards and to assess and control the OHSEMS risks arising from:

- The contractors' activities and operations that impact the organization.
- The organization's activities and operations that impact the contractors' workers.
- The contractors' activities and operations that impact other interested parties in the workplace.

The Drilling Contractor should ensure that the requirements of its OHSEMS are met by contractors and their workers. The Drilling Contractors procurement process(es) should define and apply occupational health and safety criteria for the selection of contractors.

16.2 Outsourcing

The Drilling Contractor should ensure that outsourced functions and processes are controlled and that its outsourcing arrangements are consistent with legal requirements and other requirements and with achieving the intended outcomes of the OHSEMS. The type and degree of control to be applied to these functions and processes should be defined within the OHSEMS.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Contractor and Supplier Assessment records, including approved Contractor and Supplier Register.
- Arrangements for ensuring HSE Management interfaces between the Drilling Contractor and their sub-contractors are identified and agreed upon.
- Arrangements for monitoring and auditing sub-contractor HSE performance.

17.0 Emergency Preparedness and Response

Objective

The Drilling Contractor should establish, implement, and maintain a process(es) needed to prepare for and respond to potential emergency situations.

How can this be achieved?

- Identifying foreseeable emergency scenarios (See Part 4 – Risk Management).
- Ensuring that for each scenario, emergency plans and procedures 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 program of drills and exercises to ensure that arrangements are regularly practiced and tested to exercise the planned response capability.
- Evaluating performance and, as necessary, revising the planned response, including after testing and, in particular, after the occurrence of emergency situations.
- Communicating and providing relevant information to all workers on their duties and responsibilities.
- Communicating relevant information to contractors, visitors, emergency response services, government authorities and, as appropriate, the local community.
- Taking into account the needs and capabilities of all relevant interested parties and ensuring their involvement, as appropriate, in the development of the planned response.

The Drilling Contractor should maintain and retain documented information on the process(es) and on the plans for responding to potential emergency situations.

What in the Drilling Contractor's Management System demonstrates assurance to others 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 programs, including arrangements for reviewing and retaining records.

18.0 Monitoring, Measurement, Analysis, and Performance Evaluation

Objective

The Drilling Contractor should establish, implement, and maintain a process(es) for monitoring, measurement, analysis, and performance evaluation and should determine:

- What needs to be monitored and measured, including the following:
 - The extent to which legal requirements and other requirements are fulfilled.
 - Its activities and operations related to identified hazards, risks, and opportunities.
 - Progress towards achievement of the drilling contractor's OHSEMS objectives.
 - Effectiveness of operational and other controls.
- The methods for monitoring, measurement, analysis, and performance evaluation, as applicable, to ensure valid results.
- The criteria against which the Drilling Contractor will evaluate its OHSEMS performance.
- When the monitoring and measuring should be performed.

- When the results from monitoring and measurement should be analyzed, evaluated, and communicated.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- The Drilling Contractor should evaluate the OHSEMS performance and determine the effectiveness of the OHSEMS.
- The Drilling Contractor should ensure that monitoring and measuring equipment is calibrated or verified as applicable, and is used and maintained as appropriate.
- The Drilling Contractor should retain appropriate documented information:
 - As evidence of the results of monitoring, measurement, analysis, and performance evaluation.
 - On the maintenance, calibration, or verification of measuring equipment.

18.1 Evaluation of Compliance

Objective

The Drilling Contractor should establish, implement and maintain a process(es) for evaluating compliance with legal requirements and other requirements and should:

How can this be achieved?

- Determine the frequency and method(s) for the evaluation of compliance.
- Evaluate compliance and take action if needed.
- Maintain knowledge and understanding of its compliance status with legal requirements and other requirements.
- Retain documented information of the compliance evaluation result(s).

18.2 Internal Audit

General

The Drilling Contractor should conduct internal audits at planned intervals to provide information on whether the OHSEMS:

- Conforms to:
 - The Drilling Contractor's own requirements for its OHSEMS, including the OHSEMS policy and OHSEMS objectives.
 - The requirements of this document.
- Is effectively implemented and maintained.

18.3 Internal Audit Program

The Drilling Contractor should do the following:

- Plan, establish, implement, and maintain an audit program(s) including the frequency, methods, responsibilities, consultation, planning requirements, and reporting, which should take into consideration the importance of the processes concerned and the results of previous audits.
- Define the audit criteria and scope for each audit.
- Select auditors and conduct audits to ensure objectivity and the impartiality of the audit process.
- Ensure that the results of the audits are reported to relevant managers; ensure that relevant audit results are reported to workers, and, where they exist, workers' representatives, and other relevant interested parties.
- Take action to address nonconformities and continually improve its OHSEMS performance.
- Retain documented information as evidence of the implementation of the audit program and the audit results.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Details of the audit program.
- Criteria for selecting and training 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.

19.0 Management Review

Objective

Senior management should review the Drilling Contractors OHSEMS, at planned intervals, to ensure its continuing suitability, adequacy, and effectiveness.

How can this be achieved?

The management review should include consideration of the following:

- The status of actions from previous management reviews.
- Changes in external and internal issues that are relevant to the OHSEMS, including the following:
 - The needs and expectations of interested parties.
 - Legal requirements and other requirements.
 - Risks and opportunities.

- The extent to which the OHSEMS policy and the OHSEMS objectives have been met.
- Information on the OHSEMS performance, including trends in the following:
 - Incidents, nonconformities, corrective actions, and continual improvement.
 - Monitoring and measurement results.
 - Results of evaluation of compliance with legal requirements and other requirements.
 - Audit results.
 - Consultation and participation of workers.
 - Risks and opportunities.
- Adequacy of resources for maintaining an effective OHSEMS.
- Relevant communication(s) with interested parties.
- Opportunities for continual improvement.

The outputs of the management review should include decisions related to the following:

- The continuing suitability, adequacy, and effectiveness of the OHSEMS in achieving its intended outcomes.
- Continual improvement opportunities.
- Any need for changes to the OHSEMS.
- Resources needed.
- Actions, if needed.
- Opportunities to improve integration of the OHSEMS with other business processes.
- Any implications for the strategic direction of the organization.

How can this be achieved?

Senior management should communicate the relevant outputs of management reviews to workers, and, where they exist, workers' representatives and retain documented information as evidence of the results of management reviews.

20.0 Performance Monitoring

Objective

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

How can this be achieved?

- Assessing the overall effectiveness of the HSE Management through audit, (within the Drilling Contractor's Management System)
- Reviewing performance against the objectives.
- Verifying the effectiveness of HSE critical Activities/Tasks and Equipment/Systems.
- Ensuring HSE performance is reviewed by senior management.
- Line managers and supervisors monitoring compliance with procedures and standards.
- Establishing program of workplace inspections.
- Identifying proactive and reactive performance measures that 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 others that this objective can be achieved?

- Information regarding 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 organization from both a technical and human- performance perspective.

21.0 Continual Improvement of the OHSEMS

Objective

The Drilling Contractor should continually improve the suitability, adequacy, and effectiveness of the OHSEMS.

How can this be achieved?

Improvement can be achieved through identifying, classifying, and addressing the following:

- Incidents
- Nonconformities
- Corrective Actions

The Drilling Contractor should establish, implement, and maintain a process(es), including reporting, investigating, and taking action, to determine and manage incidents and nonconformities.

To ensure continual improvement, Drilling Contractor should also focus on the following:

- Enhancing OHSEMS performance.
- Promoting a culture that supports an OHSEMS.
- Promoting the participation of workers in implementing actions for the continual improvement of the OHSEMS.
- Communicating the relevant results of continual improvement to workers, and, where they exist, workers' representatives.
- Maintaining and retaining documented information as evidence of continual improvement.

When an incident or a nonconformity occurs the Drilling Contractor should:

- React in a timely manner to the incident or nonconformity and, as applicable:
 - Take action to control and correct it.
 - Deal with the consequences.
- Evaluate, with the participation of workers and the involvement of other relevant interested parties, the need for corrective action to eliminate the root cause(s) of the incident or nonconformity, in order that it does not recur or occur elsewhere, by doing the following:
 - Investigating the incident or reviewing the nonconformity.
 - Determining the cause(s) of the incident or nonconformity.
 - Determining if similar incidents have occurred, if nonconformities exist, or if they could potentially occur.
- Review existing assessments of OHSEMS risks and other risks, as appropriate.
- Determine and implement any action needed, including corrective action, in accordance with the hierarchy of controls and the management of change.
- Assess OHSEMS risks that relate to new or changed hazards, prior to taking action.
- Review the effectiveness of any action taken, including corrective action.
- Implement changes to the OHSEMS, if necessary.

Corrective actions should be appropriate to the effects or potential effects of the incidents or nonconformities encountered. Documented information should be retained as evidence of the following:

- The nature of the incidents or nonconformities and any subsequent actions taken.
- The results of any action and corrective action, including their effectiveness.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

The Drilling Contractor should communicate this documented information to relevant workers, and, where they exist, workers' representatives, and other relevant interested parties.

22.0 HSE Management Objectives

22.1 Policies and Objectives

The policy(s) should set clear direction for the organization to follow, and the objectives provide targets against which (HSE) performance can be measured.

22.2 Organization, Responsibilities, and Resources

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

OHSEMS objectives have been organized within the Management System Elements Structure (Figure 2), 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.

Table 1: HSE Management Policies and Objectives

HSE Management Policies and Objectives	
Organization <ul style="list-style-type: none"> • Organization • Document Management • Workforce Participation • Rig Organization 	Resources <ul style="list-style-type: none"> • HSE Resources • HSE Committee Representation • Regional and Head Office Support • Clients • Client's Third Parties • Catering and Accommodation • Medical Support
Responsibilities <ul style="list-style-type: none"> • Senior Management Responsibility • Line Management Responsibility • Individual Responsibility • Regulatory Requirements 	Competence <ul style="list-style-type: none"> • Selection of Drilling Contractor's Personnel • Selection of Contractor Personnel • Competence Assessment and Records • Training • Induction Program

Table 2: HSE Management Standards and Procedures

HSE Management Standards and Procedures	
<ul style="list-style-type: none"> • Planning and Risk Management • Management of Change • Emergency Preparedness and Response • Permit to Work System • Safe Working Practices • Environmental Management <ul style="list-style-type: none"> ○ Environmental Protection ○ Management of Waste • HSE Procedures • HSE Meetings • HSE Alerts and Bulletins • Drilling and Well Control Operations <ul style="list-style-type: none"> ○ Simultaneous and Combined Operations ○ Bridging Documents ○ Simultaneous and Combined ○ Operations Risk Assessments 	<ul style="list-style-type: none"> • Rigging Operations <ul style="list-style-type: none"> ○ Adverse Weather ○ Support Units/Equipment ○ Site Assessment • Engineering Management • Lifting Operations and Material Handling • Logistics Management <ul style="list-style-type: none"> ○ Personnel Tracking ○ Transportation Operations • Hazardous and Radioactive Substances • Procurement Management • Maintenance Management • Contractor Management

Table 3: HSE Management Performance Monitoring

HSE Management Performance Monitoring
<ul style="list-style-type: none"> • Periodic Monitoring • Incident Reporting and Analysis • Behavior-Based Observation Systems • Environmental Monitoring and Measurement • Audit and Audit Compliance • Verification of HSE Critical Activities/Tasks and Equipment/Systems • Certification

Table 4: HSE Management Review and Improvement

HSE Management Review and Improvement
<p>The management review shall include consideration of:</p> <ul style="list-style-type: none"> • The status of actions from previous management reviews. • Changes in external and internal issues that are relevant to the OHSEMS management system, including: <ul style="list-style-type: none"> ○ The needs and expectations of interested parties. ○ Legal requirements and other requirements (voluntary) ○ Risks and opportunities. • The extent to which the OHSEMS policy and the OHSEMS objectives have been met. • Information on the OH&S performance, including trends in: <ul style="list-style-type: none"> ○ Incidents, nonconformities, corrective actions, and continual improvement. ○ Monitoring and measurement results. ○ Results of evaluation of compliance with legal requirements and other requirements. ○ Audit results. ○ Consultation and participation of workers. ○ Risks and opportunities. • Adequacy of resources for maintaining an effective HSEMS management system. • Relevant communication(s) with interested parties. • Opportunities for continual improvement <p>The outputs of the management review shall include decisions related to:</p> <ul style="list-style-type: none"> • The continuing suitability, adequacy, and effectiveness of the OH&S management system in achieving its intended outcomes. • Continual improvement opportunities. • Any need for changes to the OHSEMS management system. • Resources needed. • Actions, if needed.

23.0 Rig Organization

Objective

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

How can this be achieved?

This can be achieved by developing a structure in which the Rig Manager, ToolPusher, and supervisors work effectively together with respect to HSE risks. The Drilling Contractor determines

who has overall control and responsibility for the rig and the safety of the people on location and who has overall control and responsibility for the management of the HSE risks associated with the drilling and related activities. This relationship and the relevant responsibilities need to be defined, understood, and agreed upon.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- An organization chart showing the Rig Manager and his management/supervisory team.
- Roles and responsibilities for the members of the management/supervisory team.

24.0 Clients

Objective

To demonstrate that safe and effective working relationships are established with clients 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 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 others 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.

25.0 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 others 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.

26.0 Catering and Accommodation

Objective

To demonstrate the provision of suitable arrangements for the health and welfare of all personnel while on location at the rig site 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 others that this objective can be achieved?

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

27.0 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 First-Aiders (i.e., first responders) with appropriate facilities, supported by specialized medical back up.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

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

28.0 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 following processes are recorded in the PTW:
 - Task Risk Analysis (TRA)
 - Job Hazard Analysis (JHA)
 - Job Safety Analysis (JSA)
- 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 others 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 PTWs.

29.0 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 conducting 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 others that this objective can be achieved?

- Refer to Part 4, Risk Treatment.

30.0 Environmental Management

Objective

To demonstrate sound environmental performance in all operational phases, 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 that address the need to accomplish the following (see also Part 2, Objectives of a Health, Safety, and Environmental Management System (OHSEMS):
 - Comply with relevant environmental legislation, regulations, and standard.
 - Comply with contractual environmental requirements.
 - Manage any significant adverse environmental impacts.
- Ensuring environmental requirements are addressed in the shared HSE management processes and supporting documentation, such as the following:
 - HSE plans and programs.
 - 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 programs, such as the following:
 - 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 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-specific, or well-specific, significant adverse environmental impact criteria.
- Reviewing the rig’s environmental aspects against the site-specific criteria and highlighting those that may result in a significant adverse environmental impact.

What in the Drilling Contractor’s Management System demonstrates assurance to others that this objective can be achieved?

- Confirmation that environmental policies, objectives, and targets are clearly defined either as part of the organization’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 programs.
- Reference to the rig environmental aspects registers. (See Part 4 – Risk Management).
- Arrangements to consult with the client in order to do the following:
 - Identifying the nature and sensitivities of the location-specific receiving environment.
 - Establishing location-specific significant adverse impact criteria.
 - Reviewing the rig- and well-specific environmental aspects against the established criteria.

31.0 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 can this 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 others that this objective can be achieved?

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

32.0 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 can this 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 others that this objective can be achieved?

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

33.0 Occupational Health

Objective

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

How can this 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 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 others 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.

34.0 HSE Procedures

Objective

To demonstrate that relevant operating procedures are available that 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 others that this objective can be achieved?

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

35.0 Rig Security

Objective

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

How can this 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 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 others 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).

36.0 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 conducted safely and effectively and with minimum impact on human health and the environment.

How can this be achieved?

- Ensuring personnel (Operator and Third Party) involved in the operations can demonstrate competency.
- Providing relevant drilling and well control procedures.

What in the Drilling Contractor's Management System demonstrates assurance to others 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.
- Simultaneous and Combined Operations

37.0 Simultaneous and Combined Operations

37.1 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.
- 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 others 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.

37.2 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?

- Conducting 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.
- Communicating relevant information to personnel involved in the operations.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Description of arrangements for conducting 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).

38.0 Transport Operations and Site Assessment



NOTE: Only generic details are provided here. Final information is included in the location-specific document.

Objective

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

How can this be achieved?

- Where appropriate, performing location specific assessments—e.g., ground stability, aquifers, mine workings, rivers, canals—to assure suitability of the equipment for the operating environment (this may be a client responsibility and Drilling Contractors may need to detail minimum requirements for safe operations within their HSE Case).
- Ensuring personnel involved in transport operations are qualified.
- Providing relevant transport operating procedures.
- Providing supervision for critical/hazardous transport activities.

What in the Drilling Contractor's Management System demonstrates assurance to others 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 transport crews.
- Information on the transport procedures.

39.0 Adverse Weather

Objective

To demonstrate that there are clearly defined adverse weather policies.

How can this be achieved?

- Arrangement for systematically estimating probable meteorological 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 others that this objective can be achieved?

- The adverse weather policy.

40.0 Equipment Supporting Rig Operations

Objective

To demonstrate that HSE critical/hazardous activities associated with support units (cranes, forklifts, etc.) are effectively managed.

How can this be achieved?

- Co-operating with the client on the management of support units.
- Coordinating unit movements in and around the rig.
- Involving all support personnel in regular drills and exercises.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Arrangements for coordinating support unit activities.

41.0 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 others 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.

42.0 Lifting Operations and Material Handling

Objective

To demonstrate that all mechanical lifting operations and manual material handling on the rig are risk assessed and conducted 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 location management work practices.
- Proper planning, with risk assessments, of lifting operations.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Summary of how mechanical lifting operations are managed including the following:
 - 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 conducted.
 - Communication arrangements for lifting operations.
 - Supervision arrangements for distinct types of lifting operations.
 - Supervision arrangements for safe location management.
 - Manual material handling procedures.
- Details of responsibilities and authorities for manual handling and lifting operations.

43.0 Logistics Management (Personnel Tracking)

Objective

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

How can this be achieved?

- Maintaining an administrative capability to plan and co-ordinate the personnel movements with the rig, client, Drilling Contractor, and carrier (where applicable).
- Maintaining administrative capability to record arrivals and departures of people at the rig site and provide related information.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

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

44.0 Transport Operations

Objective

To demonstrate that suitable arrangements are in place to ensure all transport operations at, or in connection with, the rig will be conducted safely and effectively.

How can this be achieved?

- Assigning qualified personnel to supervise and coordinate all transport operations.
- Ensuring that personnel are competent in Transportation Operations prior to undertaking this role.
- Providing transportation procedure manuals addressing both routine and emergency transport operations.
- Maintenance and Inspection of location and associated safety equipment.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Information on the transportation arrangements and limits for equipment and materials.
- Information on the transportation of personnel by land and where applicable by air.

45.0 Hazardous and Radioactive Substances

Objective

To demonstrate that suitable arrangements are in place for storing, managing 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.
- Conducting 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 others 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).

46.0 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 others that this objective can be achieved?

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

47.0 Maintenance Management

Objective

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

How can this be achieved?

- Establishing a maintenance management system that includes the 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 others 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, Verification of HSE Critical Activities/Tasks and Equipment/Systems).
- Arrangements for implementing Management of change procedures when HSE critical equipment/systems do not meet performance standards.

48.0 Sub-Contractor Management

Objective

To demonstrate that sub-contractor HSE performance is effectively managed.

How can this be achieved?

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

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Arrangements for ensuring HSE Management interfaces between the Drilling Contractor and their sub-contractors are identified and agreed upon.
- Arrangements for monitoring and auditing sub-contractor HSE performance.
- Identifying proactive and reactive performance measures which provide an indication of current performance and function 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 others that this objective can be achieved? (See also Part 6 – Performance Monitoring)

- Information online 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 distinct levels within the organization from both a technical and human performance perspective.

49.0 Incident Reporting and Analysis

Within the IADC Incident Statistics Program (ISP) IADC offers a Serious Incident or Fatality (SIF) reporting option.

A SIF is a life-threatening, life-altering, or fatal incident including the following definitions:

- Life-Threatening – Work related injury or illness that required immediate life-preserving rescue action, and if not applied immediately would likely have resulted in the death of that person.
- Life-Altering – Work related injury or illness that resulted in a permanent and significant loss of a major body part or organ function that permanently changes or disables that person’s normal life activity.
- Fatal – Work-related fatal injury or illness.”

Objective

To demonstrate that there are arrangements for reporting, analyzing, 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 others that this objective can be achieved? (See also Part 6 – Performance Monitoring)

- 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.

50.0 Behavior-Based Observation Systems

Objective

To demonstrate that members of the workforce are encouraged to monitor HSE practices through a structured behavior-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 others that this objective can be achieved? (See also Part 6 – Performance Monitoring)

- Details of the behavior-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.

51.0 Environmental Monitoring and Measurement

Objective

To demonstrate that the environmental impact of discharges and emissions are being 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 others that this objective can be achieved? (See also Part 6 – Performance Monitoring)

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

52.0 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 others that this objective can be achieved? (See also Part 6 – Performance Monitoring)

- 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.

53.0 Rig and Equipment Certification

Objective

To demonstrate where appropriate that:

- The rig and its equipment comply with National requirements.
- The rig and its equipment comply with European requirements, as appropriate.
- The rig and its equipment comply with classification requirements as appropriate.

How can this be achieved?

- Maintaining National, European, and classification standards and requirements.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved? (See also Part 6 – Performance Monitoring)

- Details on current status of rig and equipment certification.

54.0 Attachments

- *Document Control and Document Hierarchy*
 - Description or diagram showing the hierarchy of HSE risk management documents.
- *Listing of HSE Management Support Documents and Manuals*

- Titles of the company's main HSE procedures, manuals, etc.
- *Organization Charts*
 - Organigram (i.e., “a diagram . . . that shows the structure of the people in an organization”) showing the rig and support organizations. (Cambridge Dictionary)

Part 3: Rig/Unit Description and Supporting Information

55.0 Introduction HSE Equipment and Systems

55.1 The HSE Case

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

Part 2, Part 3, and Part 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 can do either of the following:

- Demonstrate assurance that HSE management objectives are being met.
- Identify 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.

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

See Figure 5, an illustration of HSE Management Assurance structure.

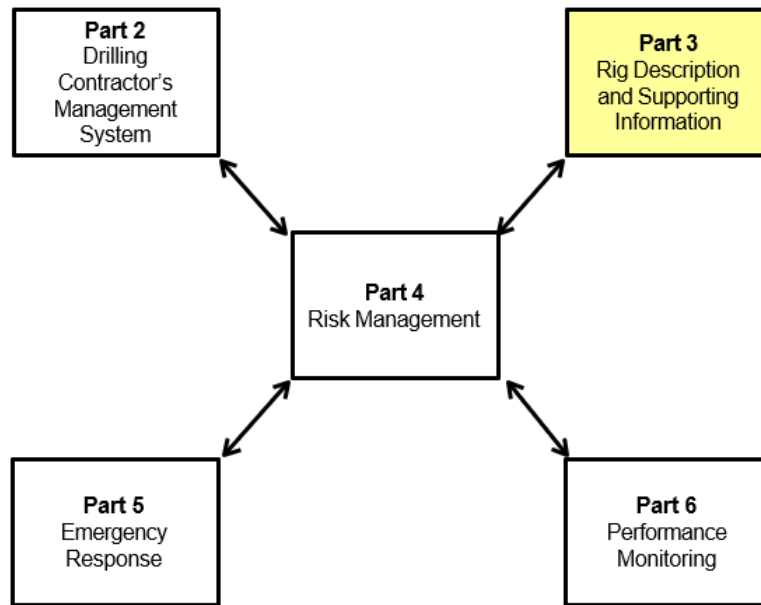


Figure 5: HSE Management Assurance: Rig Description and Supporting Information

55.2 Content of the HSE Case

The HSE Case should include or reference supporting information describing the Rig/Unit, 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 that 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.

General Information

- Rig/Unit Details
- Certification and Registration
- Rig/Unit Mobilization/Demobilization including Rigging Up/Down
- Rig/Unit Layout
- Major Modifications and Upgrades
- Selection of HSE Critical Equipment/Systems
- Land Transportation

Primary Structure

- Environmental Operating Limits/Design Criteria

- Structural Integrity
- Foundation Stability

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

Equipment and Facilities

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

Fire and Explosion Protection

- Hazardous Area Classifications
- Detection Systems
- Emergency Shut Down Systems
- Active Fire Protection
- Passive Fire Protection (where applicable)

Emergency Systems

Means of recovery to a safe place rig emergency actions matrix Alarm Systems Fire & Emergency rescue equipment (Confined Space/Work at height).

Accommodation / Camp Sites

(Where provided)

Accommodation / Camp Sites

(Where provided)

Well Testing

(Generic requirements)

- Well Testing
- Extended Well Tests

Other Third-Party Equipment

(Generic requirements)

- Wireline Units
- Cement Units
- Cuttings Handling Equipment
- Mud Logging Units
- H2S Equipment

56.0 General Information

56.1 Rig/Unit Details

Objective

To provide an overview of the Rig/Unit to which the HSE Case applies.

What should be (referenced) in the HSE Case?

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

56.2 Certification

Objective

To demonstrate that the Rig/Unit complies with applicable internationally and/or nationally recognized Certification and standards.

What should be (referenced) in the Case?

- Details of the extent to which the Rig/Unit and its equipment/systems are subject to certification or examination by a recognized national and/or international body.

- Details of the extent to which the Rig/Unit and its equipment/systems are subject to National certification.
- Deviations from design specification and/or formal exemptions given from the relevant National Authority, including any operational limitations imposed.

56.3 Rig/Unit Moves including Rigging Up / Down

Objective

To provide an overview of the Drilling Contractor's policy, procedures, and practices regarding Rig/Unit moves (mobilization/demobilization), especially rigging up and down.

What should be (referenced) in the Case?

- A brief description of the mobilization/demobilization process of the Rig/Unit.
- An overview of the Drilling Contractor's traffic/transport management procedures to safely control rig site operations during mobilization/demobilization.
- An overview of the tasks, activities, and operations associated with rigging up or down and how they will be adequately controlled and managed.
- Description of any specific heavy lift operations and how they will be adequately controlled and managed.

56.4 Rig/Unit Layout

Objective

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

What should be (referenced) in the Case?

- Description of the standard Rig/Unit layout with specific reference to features that may affect its HSE Management and significantly influence the overall risk.
- Layout drawings showing relative positions of the primary equipment and HSE equipment/systems.

56.5 Major Modifications and Upgrades

Objective

To provide information of any modifications or upgrades that have significantly changed the Rig/Unit'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 Rig/Unit's HSE Management (e.g., soundproofing measures, etc.).
- Deviations from design specification and/or formal exemptions given from relevant national or governmental certification bodies, including any operational limitations imposed.

56.6 Management of Change

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

Objective

The Drilling Contractor should establish a process(es) for the implementation and control of planned temporary and permanent changes that impact OHSEMS performance 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?

This can be achieved by:

- 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.
- Ensuring products, services and processes, or changes to existing products, services and processes, are include in the Management of Change process including:
 - Workplace locations and surroundings
 - Work organization
 - Working conditions
 - Equipment
 - Work force
 - Changes to legal requirements and other requirements
 - Changes in knowledge or information about hazards and OHSEMS risks
 - Developments in knowledge and technology

The Drilling Contractor should review the consequences of unintended changes, taking action to mitigate any adverse effects, as necessary.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Description of the change management procedures

56.7 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 Risk Optimization Strategies section in Part 4 and Verification section in Part 2.)
- Descriptions of arrangements for ensuring HSE critical equipment/systems comply with National requirements.
- Descriptions of arrangements for ensuring HSE critical equipment/systems comply with relevant codes and standards, e.g., API, ISO, NACE, ASME, CE, or EU, etc.

56.8 Land Transportation

Objective

To provide an overview of the Drilling Contractor's policy, procedures, and practices regarding Land Transportation of rig personnel to/from the Rig/Unit site.

What should be (referenced) in the Case?

- A brief description of the Drilling Contractor's policy and procedures regarding personnel movement to and from the Rig/Unit site, including any specific training or constraints imposed on journey times/travel distance, etc.

57.0 Primary Structure of Rig/Unit

57.1 Operating Limits/Design Criteria

Objective

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

What should be (referenced) in the HSE Case?

To show that the Rig/Unit has been designed and is maintained for the stated operating and environmental conditions.

- Information on the national regulations and International Codes and Standards used to assess the design and construction of the Rig/Unit (e.g., API, ASME, ISO etc.).
- Limiting environmental operating criteria, i.e., wind, temperature, and ground conditions. (Other environmental operating criteria, e.g., drilling and lifting operations are considered under the relevant headings below.)

57.2 Structural Integrity

Objective

To ensure the structural integrity of the rig and rig equipment is not compromised during rig and rig equipment operations.

What should be (referenced) in the HSE Case?

- Description and, where appropriate, fire ratings of the main structural components, including inspection reports from recognized specialist organizations.
- Details of:
 - Primary dimensions and construction materials.
 - Integrity analyses including, where appropriate, fatigue studies (if available).
 - Inspection/NDT and survey programs.

57.3 Foundation Stability

(Generic details only, final information included in location-specific document.)

Objective

To identify specific foundation requirements that need to be provided to safely support the Drilling Contractor's Rig/Unit and all its components in order to ensure optimum performance under specific operating and environmental conditions.

What should be (referenced) in the HSE Case?

- Environmental design limitations of the mast and other equipment.
- Foundation requirements based on API 4F for the design loading of the Rig/Unit.

58.0 Drilling, Completion, and Well Control

58.1 Hoisting and Pipe 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 following:
 - Mast structure
 - Hoisting system
 - Top drive and rotary systems
 - Pipe handling systems (e.g., pick-up/lay down machine, etc.)
 - Mechanized operations (where installed)
- Details of the inherent features of installed equipment/systems that are intended to prevent or mitigate risk escalation, including the elimination of manual handling and impact on the environment, to support the Rig/Unit's HSE Management.
- Details of how the Drilling Contractor aims to minimize manual handling.

58.2 Mud 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) for the following:
 - 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
- Line drawings of the (HP / LP) mud system.
- Description of mud/well monitoring systems.
- Identification of additional components preventing loss of containment / spillage (valve lockout / tagout, spades, blanks, etc.).

58.3 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 following:
 - BOP
 - BOP control systems
 - Choke manifold
- BOP-Stack Drawing
- Statement that the BOP and its control system were designed to API Standard 6A or equivalent.
- Confirmation that BOP system is maintained in accordance with API RP 53 or equivalent.
- Details of arrangements for Managed Pressure Drilling Systems (if applicable).
- Details of arrangements for High Pressure High Temperature (HPHT) Systems (if applicable).

59.0 Equipment and Utilities

59.1 Power Generation and Distribution

Objective

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

What should be (referenced) in the HSE Case?

- Description and ratings of the main power generation arrangements and power assignment arrangements (e.g., draw-works, mud pumps, etc.).
- Details of the main power distribution protective systems.
- Details of the emergency generator(s), including the following:
 - Rating and endurance at rated and anticipated emergency load.
 - Start-up arrangements.
- Single line diagrams of the main and emergency power arrangements.
- Information on atmospheric emission factors used to estimate emissions including source (API, manufacturer, etc.).
 - Equipment powered from the emergency system.
 - Load shedding arrangements.

59.2 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.
- Details of safety 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, etc.).

59.3 Rig/Unit Air System

Objective

To describe the Rig/Unit air arrangements.

What should be (referenced) in the HSE Case?

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

59.4 Heating, Ventilation, and or Air Conditioning Systems

(Generic details only where applicable; final information included in location-specific document.)

Objective

To describe the minimum requirements for Rig/Unit site or location systems that are necessary to:

- Prevent flammable and toxic gases accumulating in enclosed spaces.
- Prevent smoke and gas ingress into working spaces.
- Maintain air quality and temperature in any living and working spaces provided.

What should be (referenced) in the HSE Case?

- Description of any installed systems, including details of the following:
 - Arrangements necessary to ensure adequate ventilation of enclosed workplaces, including local extraction of fumes, dust, etc.
 - Arrangements necessary to maintain air quality and temperature in accommodation / camp site where provided.
 - Arrangements for filtering to ensure air quality.
 - Arrangements for cleaning and disinfection of air ducts.

59.5 Drain, Effluent, and Waste Systems

(Generic details only where applicable; final information included in location-specific document.)

Objective

To describe the minimum arrangements expected to be provided for handling:

- Accumulations of fluids at the Rig/Unit, campsite, and mud-handling areas.
- Cuttings and other accumulations of solids.
- 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 handling, segregation, and storage of other waste (including hazardous waste).

59.6 Cyber Security and 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 Rig/Unit, e.g., alarms, signals, telephones, drill crew communication systems (voice-to-voice mast-floor intercom).
- A description of the arrangements for communication with remote support locations and emergency services.
- There are several certification bodies that will provide compliance certification. Certificates like these can provide valuable assurance to interested parties regarding adherence to recognized standards.
- Cyber Essentials Plus is an example of one such certification company. They offer a Certificate of Assurance that can be obtained. (**Disclaimer:** For the sake of good order, IADC does not endorse this company or promote any specific certification body. The Drilling Contractor should take a commercial decision that serves their best interest.)

59.7 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.

59.8 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?

- BOP trolley lift capacity Details, with ratings of the:
 - Pipe handling equipment (See also the Hoisting and Pipe Handling section 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.

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

(Generic details only where applicable; final information included in location-specific document.)

Objective

To describe Drilling Contractor minimum requirements for storing and handling explosives, flammable materials, and other hazardous materials.

What should be (referenced) in the HSE Case?

- Description and optimum safe location of the explosive storage facility (where use is proposed).
- Description and optimum safe location of radioactive material storage facility, including security arrangements (where use is proposed).
- Details of facilities provided for storing flammables and other hazardous substances.
- Details of any fire detection and protection systems required in these areas.

60.0 Fire and Explosion Protection

60.1 Hazardous Area Classifications

Objective

To define the operational areas that 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 area classification.
- Procedures that will be used to assess the suitability and use of temporary (third- party) equipment.
- Drawing(s) of the designated hazardous areas.
- Rating of the hazardous areas in relation to use of installed Explosion Proof and intrinsically safe equipment and the location of temporary equipment. See note below.



NOTE: “The ATEX Directive 2014/34/EU covers equipment and protective systems intended for use in potentially explosive atmospheres. The directive defines the essential health and safety requirements and conformity assessment procedures, to be applied before products are placed on the EU market. It is aligned with the new legislative framework.”

Source: https://ec.europa.eu/growth/sectors/mechanical-engineering/equipment-potentially-explosive-atmospheres-atex_en

60.2 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 the following:
 - Sensor types and locations.
 - Indicator panel location.
 - Executive actions automatically initiated on detection (as applicable).
 - Maintenance and testing.
- Description of the Drilling Contractor's minimum location-specific requirements for fixed and portable Oxygen (O₂), Hydrocarbon (HC) and Hydrogen Sulfide (H₂S) detection systems/instruments:
 - Locations of gas detection heads.
 - Indicator panel's location.
 - Actions initiated automatically on detection of HC and/or H₂S (as applicable).
 - Maintenance, testing, and calibration.

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

60.4 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 firefighting systems including the following:
 - Fire pump capacities and locations.
 - Protection systems installed.

- Other fixed systems, e.g., Argon or CO2.

60.5 Passive Fire Protection (where applicable)

Objective

To describe any passive fire protection systems installed on the Rig/Unit.

What should be (referenced) in the HSE Case?

Description of passive fire protection systems including the following:

- Drawing showing location and rating of the Rig/Unit's fire-resistant structure.
- Details of any structural fire protection for load bearing structures.
- Details of unprotected non-loading bearing structures that have a role in controlling fires.
- Details of any HSE critical equipment/systems that has passive fire protection.

61.0 Emergency Systems

Objective

To describe the minimum Emergency systems that are required to be provided in the event of a major incident that results in the evacuation of the Rig/Unit site. (See Part 5 Emergency Response.)

What should be (referenced) in the HSE Case?

- Drawing(s) showing the main routes of access/egress to the appointed muster points.
- Confirmation that these routes are equipped with suitable main and emergency lighting.

62.0 Accommodation / Camp Site

(Generic details only where applicable; final information included in location-specific document.)

Objective

To describe the Drilling Contractor's minimum requirements for accommodation (i.e., camp site) facilities, where provided for personnel working on the Rig/Unit.

What should be (referenced) in the HSE Case?

- Description of the office accommodation on location.
- Description of accommodation facilities provided for supervisory personnel.
- Description of the Drilling Contractor's minimum location-specific requirements for accommodation (i.e., camp site) facilities for the Rig/Unit crew, where provided.
- Description of the Drilling Contractor's minimum location-specific requirements for safety equipment in accommodation (i.e., camp site) facilities, where provided (e.g., fire extinguishers, etc.).

- Description of the Drilling Contractor's minimum location-specific requirements regarding the arrangements made to preserve the health of Rig/Unit personnel in the accommodation (i.e., camp site) facilities, where provided.
- Details of the Drilling Contractor's minimum location-specific requirements for the potable water system and arrangements, including methods used to ensure quality of potable water in accommodation (i.e., camp site) facilities, where provided.

63.0 Well Testing

Objective

To describe the arrangements for installing well testing equipment on the Rig/Unit.

What should be (referenced) in the HSE Case?

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

64.0 Other Third-Party Equipment

Objective

To describe the Drilling Contractor's minimum requirements regarding the arrangements for locating third-party equipment on the Rig/Unit.

What should be (referenced) in the HSE Case?

Arrangements for:

- Reviewing the status/condition of third-party equipment prior to installation, including the following:
 - Wireline units.
 - Cement units.
 - Cuttings handling equipment.
 - Mud logging units.
 - H₂S equipment.
 - Any other third-party equipment that may be installed on the Rig/Unit.
- Checking interfaces between the third-party equipment and existing Rig/Unit systems.

65.0 Recommended Drawing List

A list is provided in Appendix C Drawings and Schematics. The list is intended only to be a guide to the drawings that should be considered for inclusion or referenced in the HSE Case.

Part 4: Risk Management

66.0 Introduction

Objectives

The objective of these guidelines is to provide a model to follow for all Drilling Contractors on the development, content, and operationalization of the Land Rig HSE Case used for the intended/specific Operation.

These HSE Case Guidelines are intended to give further support for all Land Rig Operations requirements and give direction on effective development and implementation of measures of the Rig Health and Management System, specifically addressing issues related to Major Accident Hazard (MAH) prevention. Particular focus is targeted at identifying Safety Critical Element (SCE) identification and setting, as well as monitoring and verification of the associated performance standard.

It is also intended to give guidance to Drilling Contractors on the submittal, approval, and verification process for formal acceptance of the Health, Safety, and Environment Management System for the Land Drilling Contractor.

It is the responsibility of each Drilling Contractor to ensure that any further revisions issued by IADC to these HSE Case Guidelines for land rigs are reviewed and implemented as applicable.

Scope

These guidelines are applicable for rig contractors' global operations. When operating in a country subject to regulatory requirements, these guidelines are intended to provide a complementary framework by which regulatory compliance may be achieved while facilitating best-practices for optimum and safe performance of activities. These guidelines shall not be used in conflict with, or otherwise to contradict, adherence to mandated provisions.

Structure

These guidelines provide due regard for policies, standards, and other recognized drilling industry best practices promulgated by, but not limited to, such industry bodies as: ISO, API, IOGP, and applicable classification societies.

Abbreviations and Definitions

For abbreviations and definitions of terms used in this section, please see Appendix B Abbreviations and Definitions.

67.0 Land Drilling Units HSE Case

As stated, the drilling contractor should have in place an HSE Case developed in accordance with this latest revision of the IADC Guidelines.

The HSE Case should accomplish the following:

- Demonstrate that there is an effective system in place to manage major hazards, other work-place hazards, and environmental hazards.
- Identify all potential hazards, including major accident events.
- Identify, assess, and manage the risks associated with the hazards and demonstrate that all residual risks have been reduced to tolerable levels.
- Identify those personnel with HSE Critical Tasks to maintain Safety Critical Barriers.

67.1 HSE Case Contents

The rig HSE Case (as per international standards and guidelines) should contain the following as a minimum:

- Introduction/Expectations
- Drilling Contractors Management description 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 tolerable levels.
- Land rig description and supporting information, describes the equipment and systems necessary to meet the HSE management objectives and to fulfil the requirements of the drilling contractors' scope of operations.
- 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 of risk that is tolerable to the Drilling Contractor. 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.
- 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.
- 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. (See Part 6 Performance Monitoring.)
- Remedial Action Plan (RIG requirement), is a compilation of recommendations identified during OHSEMS assessments. All recommendations should be reviewed and accepted by the HSE PIC. The recommendations should be tracked to closure via a formal action tracking system, to be put in place by the drilling contractor HSE Management to ensure that it is properly monitored.

All Drilling Contractors should refer to this latest revision of the IADC HSE Case Guidelines for detailed guidance on the structure and content of Part 4. The case structure is as shown in Figure 6 below.

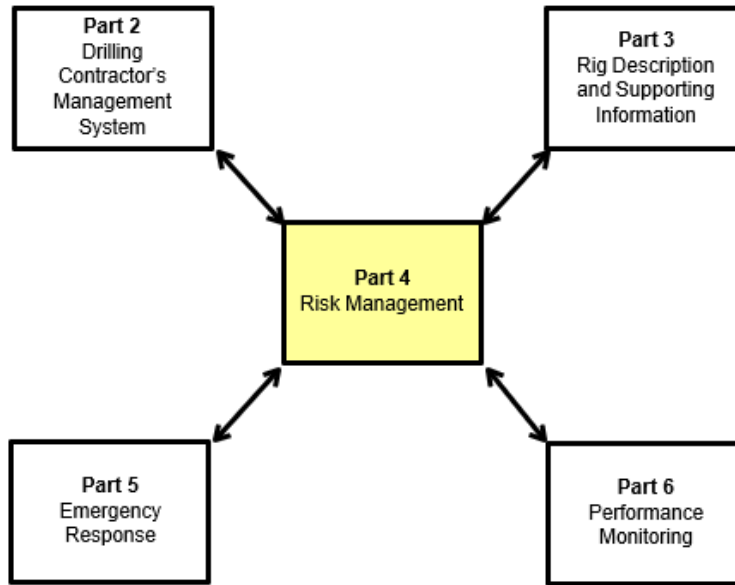


Figure 6: HSE Case Guidelines Document Structure

The HSE Case Guideline for Land Rigs should Have a minimum of these 6 Parts.

68.0 The Risk Management Process

The objective of Part 4 of the HSE Case is to demonstrate the effectiveness of the Drilling Contractors risk management process and critically how it is applied by the rig personnel at the worksite.

These IADC Guidelines call for a consistent approach in identifying and managing risk, thus this section is intended to demonstrate that the Risk Management Process for assuring that risks associated with the Rig operations are reduced to a level that is tolerable.

The HSE Case is the principal document that is used to identify Major Accident Hazards and to establish the barriers that should be in place to prevent or mitigate the consequences of the MAH.

The HSE Case should also identify the Environmental and Occupational risks and identify measures to eliminate these risks or reduce them to As Low As Reasonably Practicable (ALARP).

68.1 Risk Management Framework

The purpose of the risk management framework is to assist the organization in integrating risk management into significant activities and functions. The effectiveness of risk management will depend on its integration into the governance of the organization, including decision-making. This requires support from interested parties, particularly top management.

Framework development encompasses integrating, designing, implementing, evaluating, and improving risk management across the organization. Figure 7 illustrates the components of a framework.



Figure 7: Risk Management Framework

The Leadership and Commitment Strategy Should Encompass the Elements in this Illustration.

68.2 Key Considerations

The purpose of the risk management framework is to assist with integrating risk management into all activities and functions, including decision-making.

The following are to be addressed as key considerations:

- Leadership and Commitment, including:
 - Aligning risk management with the strategy, objectives, and culture of the organization.
 - Issuing a statement or policy that establishes a RM approach, plan, or course of action.
 - Making necessary resources available for managing risk.
 - Establishing the amount and type of risk that may or may not be taken (risk appetite).
- Integration, including:
 - Determining management accountability and oversight roles and responsibilities.
 - Ensuring risk management is part of, and not separate from, all aspects of the organization.
- Design, including:
 - Understanding the organization and its internal and external context.
 - Articulating risk management commitment and allocating resources.

- Establishing communication and consultation arrangements.
- Implementation, including:
 - Developing an appropriate implementation plan including deadlines.
 - Identifying where, when, and how different types of decisions are made, and by whom.
 - Modifying the applicable decision-making processes where necessary.
- Evaluation, including:
 - Measuring framework performance against its purpose, implementation, and behaviors.
 - Determining whether it remains suitable to support achievement of objectives.
- Improvement, including:
 - Continually monitoring and adapting the framework to address external and internal changes.
 - Taking actions to improve the value of risk management.
 - Improving the suitability, adequacy, and effectiveness of the RM framework.

69.0 Risk Assessment

69.1 General

Risk assessment is the overall process of risk identification, risk analysis, and risk evaluation.

Risk assessment should be conducted systematically, iteratively, and collaboratively, drawing on the knowledge and views of all participants. It should use the best available information, supplemented by further enquiry as necessary.

Risk Assessment Process

The risk assessment process shown in Figure 8 illustrates the systematic application of policies, procedures, and practices to the activities of communicating and consulting, establishing the context and assessing, treating, monitoring, reviewing, recording, and reporting risk.

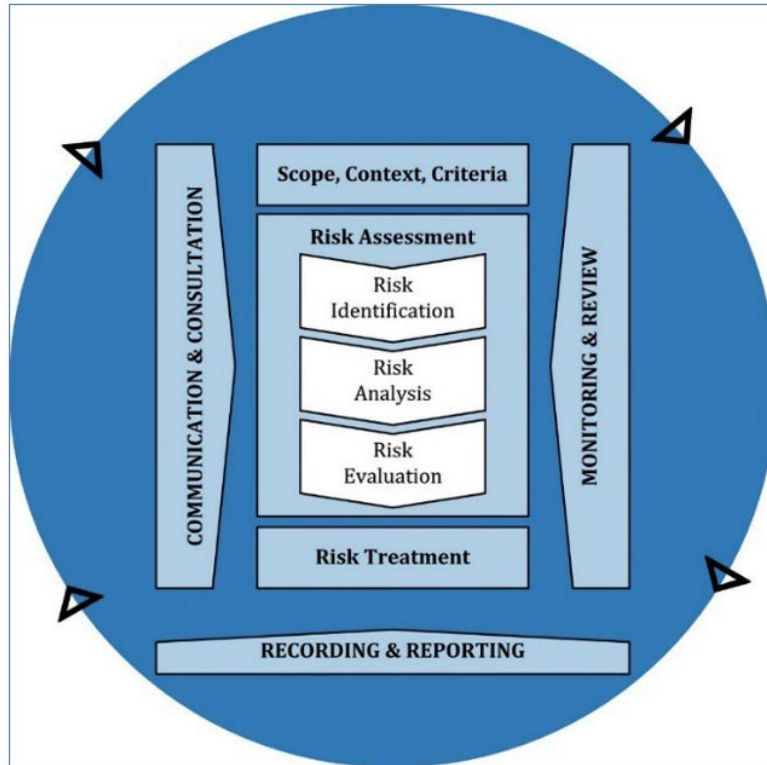


Figure 8: Risk Assessment Process. The Main Elements of the Structure.

69.2 Risk/Hazard Identification

The purpose of risk identification is to find, recognize and describe risks that might help or prevent achieving objectives. Relevant, appropriate, and up-to-date information is important in identifying risks.

The drilling contractor can use a range of techniques for identifying uncertainties that may affect one or more objectives. The following factors, and the relationship between these factors, should always be considered:

- Tangible and intangible sources of risk.
- Causes and events.
- Threats and opportunities.
- Vulnerabilities and capabilities.
- Changes in the external and internal context.
- Indicators of emerging risks.
- The nature and value of assets and resources.
- Consequences and their impact on objectives.
- Limitations of knowledge and reliability of information.
- Time-related factors.

69.3 Risk Analysis

The purpose of risk analysis is to comprehend the nature of risk and its characteristics including, where appropriate, the level of risk. Risk analysis involves a detailed consideration of uncertainties, risk sources, consequences, likelihood, events, scenarios, controls, and their effectiveness. An event can have multiple causes and consequences and can affect multiple objectives.

Risk analysis can be undertaken with varying degrees of detail and complexity, depending on the purpose of the analysis, the availability and reliability of information, and the resources available. Analysis techniques can be qualitative, quantitative, or a combination of these, depending on the circumstances and intended use.

Risk analysis should consider factors such as the following:

- The likelihood of events and consequences.
- The nature and magnitude of consequences.
- Complexity and connectivity.
- Time-related factors and volatility.
- The effectiveness of existing controls.
- Sensitivity and confidence levels.

The risk analysis may be influenced by any divergence of opinions, biases, perceptions of risk and judgements. Additional influences are the quality of the information used, the assumptions and exclusions made, any limitations of the techniques and how they are executed. These influences should be considered, documented, and communicated to decision makers.

Risk analysis provides an input to risk evaluation, to decisions on whether risk needs to be treated and how, and on the most appropriate risk treatment strategy and methods. The results provide insight for decisions, where choices are being made, and the options involve different types and levels of risk.

69.4 Risk Evaluation

The purpose of risk evaluation is to support decisions. Risk evaluation involves comparing the results of the risk analysis with the established risk criteria to determine where additional action is required. This can lead to a decision to the following:

- Do nothing further.
- Consider risk treatment options.
- Undertake further analysis to better understand the risk.
- Maintain existing controls.
- Reconsider objectives.

70.0 Risk Treatment

70.1 General

The purpose of risk treatment is to select and implement options for addressing risk. Risk treatment involves an iterative process of:

- Formulating and selecting risk treatment options.
- Planning and implementing risk treatment.
- Assessing the effectiveness of that treatment.
- Deciding whether the remaining risk is acceptable.
- If not acceptable, taking further treatment.

70.2 Selection of Risk Treatment Options

Selecting the most appropriate risk treatment option(s) involves balancing the potential benefits derived in relation to the achievement of the objectives against costs, effort or disadvantages of implementation.

Risk treatment options are not necessarily mutually exclusive or appropriate in all circumstances. Options for treating risk may involve one or more of the following:

- Avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk.
- Taking or increasing the risk in order to pursue an opportunity.
- Removing the risk source.
- Changing the likelihood.
- Changing the consequences.
- Sharing the risk (e.g., through contracts, buying insurance).
- Retaining the risk by informed decision.

Risk treatments, even if carefully designed and implemented might not produce the expected outcomes and could produce unintended consequences. Monitoring and review need to be an integral part of the risk treatment implementation to give assurance that the different forms of treatment become and remain effective.

Risk treatment can also introduce new risks that need to be managed. If there are no treatment options available or if treatment options do not sufficiently modify the risk, the risk should be recorded and kept under ongoing review.

70.3 Preparing and Implementing Risk Treatment Plans

The purpose of risk treatment plans is to specify how the chosen treatment options will be implemented, so that arrangements are understood by those involved, and progress against the plan can be monitored. The treatment plan should clearly identify the order in which risk treatment should be implemented.

Treatment plans should be integrated into the management plans and processes of the organization, in consultation with appropriate interested parties.

- The information provided in the treatment plan should include the following:
- The rationale for selection of the treatment options, including the expected benefits to be gained.
- Those who are accountable and responsible for approving and implementing the plan.
- The proposed actions.
- The resources required, including contingencies.
- The performance measures.
- The constraints.
- The required reporting and monitoring.
- When actions are expected to be undertaken and completed.

70.4 Monitoring and Review

The purpose of monitoring and review is to assure and improve the quality and effectiveness of process design, implementation, and outcomes. Ongoing monitoring and periodic review of the risk management process and its outcomes should be a planned part of the risk management process, with responsibilities clearly defined.

Monitoring and review should take place in all stages of the process. Monitoring and review includes planning, gathering, and analyzing information, recording results, and providing feedback.

The results of monitoring and review should be incorporated throughout the contractor's performance management, measurement, and reporting activities.

70.5 Recording and Reporting

The risk management process and its outcomes should be documented and reported through appropriate mechanisms. Recording and reporting aims to:

- Communicate risk management activities and outcomes across the organization.
- Provide information for decision-making.
- Improve risk management activities.
- Assist interaction with interested parties, including those with responsibility and accountability for risk management activities. Decisions concerning the creation, retention and handling of documented information should consider, but not be limited to: their use, information sensitivity and the external and internal context.

71.0 Methods to Identify and Manage Rig Hazards

The HSE Case is the principal document that is used to identify and record the Major Accident Hazards (MAH), Environmental and Occupational risks and consequently establish the barriers that are in place that prevent or mitigate the consequences of the MAH.

The Risk Assessment Process should address the key 5 steps as outlined in Figure 9 below:

- Step 1: Identify Hazards.
- Step 2: Decide who may be harmed and how.
- Step 3: Evaluate the risks and decide on the precautions.
- Step 4: Record your findings and implement them.
- Step 5: Review your assessment and update if necessary.

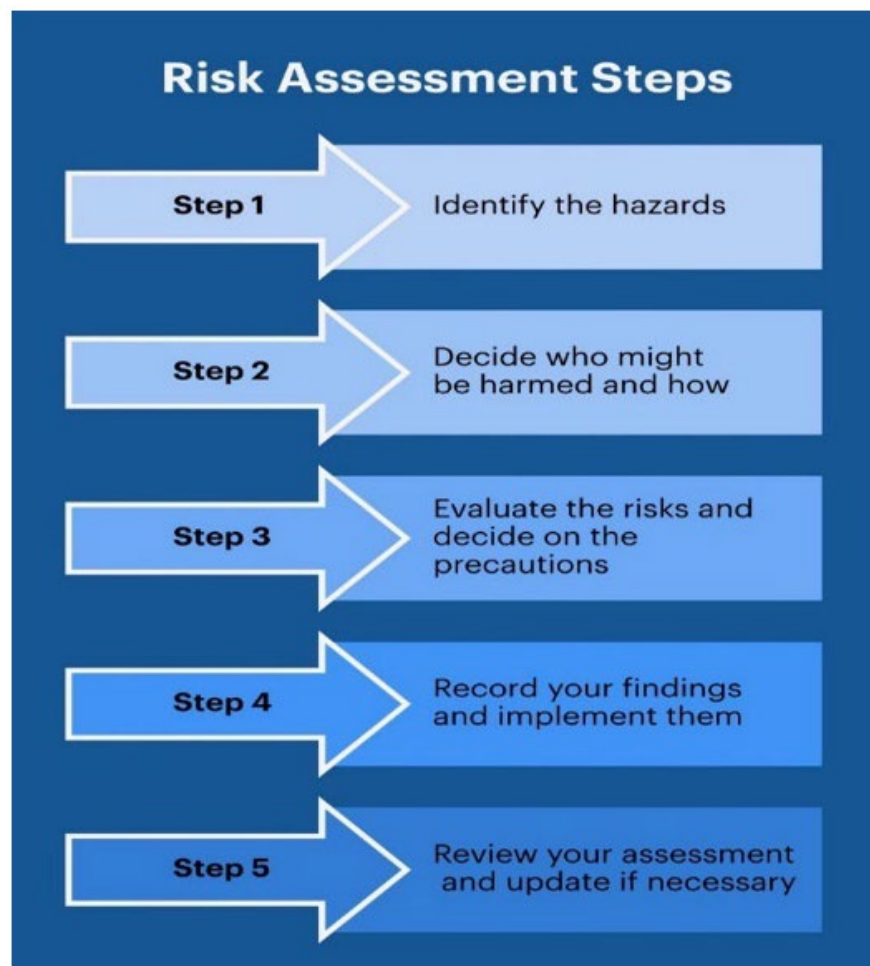


Figure 9: Risk Assessment Steps

71.1 Hazard Identification

The Hazard Identification (HAZID) study is a technique for early identification of hazards and threats and can be applied at the conceptual or detailed design stage. Early identification and assessment of hazards provides essential input to project development decisions at a time when a change of design has a minimal cost penalty.

A HAZID study is carried out by an experienced multi-discipline team using a structured approach based on a checklist of potential hazards. Potential problems are highlighted for action outside the meeting.

Typical process hazards are considered such as environmental, geographical, process, fire and explosion, health, occupational, etc.

71.2 HAZID Objectives

- Identify hazards to the host facilities due to design and evaluate potential consequences should the hazards be realized.
- Establish safeguards to manage hazards identify areas where further understanding of safeguard effectiveness is needed.
- Make recommendations to reduce the likelihood of hazard occurrence or mitigate the potential consequences by exercising in the HAZID Steps. The HAZID method, accepted as one of the best techniques for identifying potential hazards and operability problems, involves the following:
 - Assembly of a team of experienced project personnel.
 - Presentations detailing the scope of the HAZID.
 - Identify hazards, causes, consequences and safeguards.

71.3 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), the environment (E), assets (A) 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 are 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.

Table 5 includes examples of appropriate techniques for hazard identification.

Table 5: Hazard Identification (HAZID) Methods

Hazard Identification (HAZID) Methods	
Relevant legislation/regulatory documents	Existing environmental management practices and procedures
Incident, Audit, and Inspection reports	Environmental discharge and emission records
Hazard identification (HAZID) ENVIID	“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)	SIL/LOPA

The following are some examples of rig hazards:

- Vehicle accident hazards
- Struck by/caught in hazards
- Fall hazards
- Fire and/or explosion hazards
- Electrical shock hazards
- Downhole hazards
- Ergonomic hazards due to heavy job tasks
- Heat and/or cold hazards
- Hazards associated with living conditions
- Hazards associated with the fast work pace
- Hazards associated with inexperienced workers
- Environmental hazards
- Occupational hazards

See Table 6 for a breakdown of the causes and results of hazards specifically related to land drilling rigs.

Table 6: Typical Land Drilling Rig Hazards

Drilling-Related Task	Hazard	Harm
Driving light or heavy vehicles	Struck by (MVA)	Injury / Death/ Loss or Damage of Property
Unloading Tubulars	Caught In	Pinching, Crushing (Injury)
Monkey Board	Fall	Injury or Death
Tripping Out	Explosion	Injury / Death/ Loss or Damage of Property
Electrical Wiring	Electrical Shock	Injury or death
Summer Work	Heat Stress	Heat Stroke
Cleaning Tanks	Asphyxiation	Injury or Death
Sour Well Servicing	H2S Exposure	Loss of coincidence / Death
Drinking water at site	Bacteria	Illness

It should be noted that Information on the identified Hazards and the potential consequences associated with each hazard class should be recorded in the Drilling Contractor's Hazard Register which will continue to be developed and forms an important part of the HSE Case.

The main goals of the register should be as follows:

- 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 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.

71.4 Risk Assessment Matrix (RAM)

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.

These Guidelines do not prescribe which RAM should be adopted and each Rig Contractor may have different matrices, but the RAM is fundamental in the risk management process for determining MAH.

The following RAM (Table 7: Risk Assessment Matrix (RAM)Table 7) is a typical RAM to be utilized for determining risk.

Table 7: Risk Assessment Matrix (RAM)

Risk Assessment Matrix (RAM)							
IMPACT		Severity	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
		People	Slight injury	Minor injury	Major injury	Single Fatality	Multiple Fatalities
		Asset	Slight Damage	Minor Damage	Local Damage	Major Damage	Extensive Damage
		Environment	Slight Impact	Minor Impact	Localized Impact	Major Impact	Massive Impact
		Reputation	Slight Impact	Limited Impact	Considerable Impact	Major National Impact	Major International Impact
LIKELIHOOD	E Almost Certain	Happens several times per year at location	E1	E2	E3	E4	E5
	D Likely	Happens several times per year in company	D1	D2	D3	D4	D5
	C Possible	Incident has occurred in our company	C1	C2	C3	C4	C5
	B Unlikely	Heard of incident in industry	B1	B2	B3	B4	B5
	A Remotely likely to happen	Never heard of in industry	A1	A2	A3	A4	A5

The classification of hazards as MAH is determined by risk ranking. Major Accident Hazards are represented by risks ranked as Red – VERY HIGH (E4, E5, D5), Orange – HIGH (B5, C5, D4, E3).

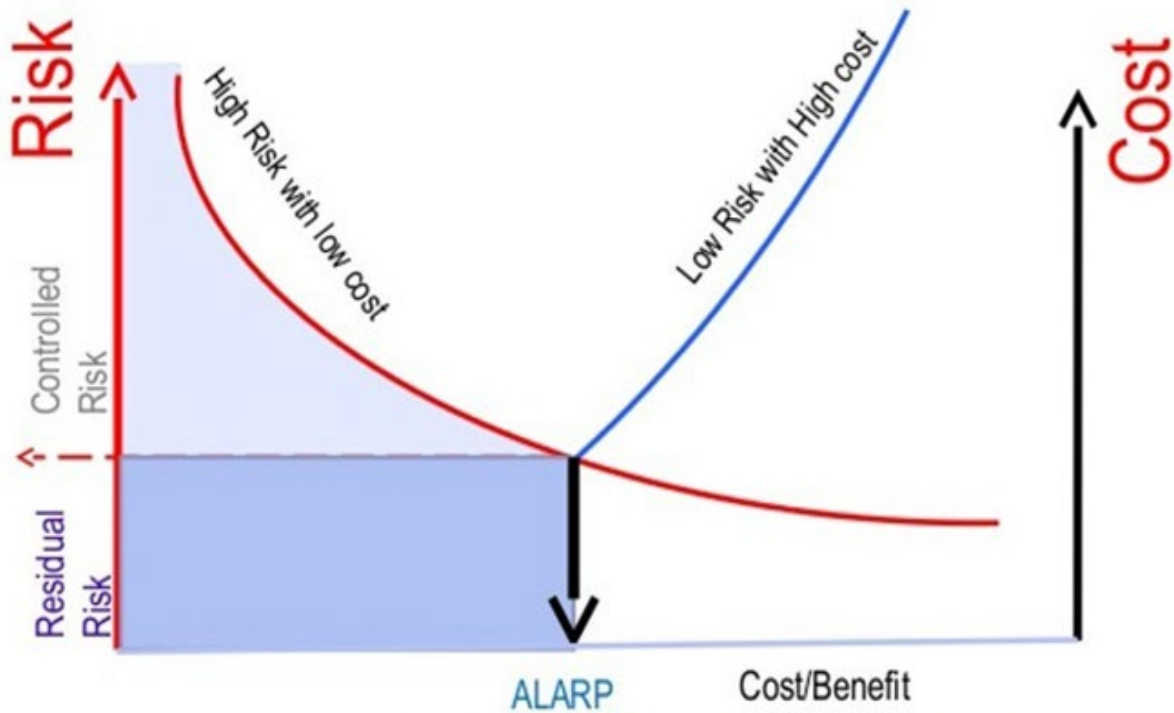
Regardless of which RAM has been applied when determining the classification of Hazards, the relevant HSE Case should reference the following:

- A description of the process used to systematically evaluate and select the barriers that will be applied to reduce the risk of each identified hazard and source.
- The completed Rig Contractors Hazard/Risk Register listing all the hazards and sources, the estimates of the associated risks, the significance of these risks, and the references to the associated barriers selected to reduce the associated risks.
- A description of the critical activities, resources, and competencies, etc., needed to ensure these documents are all established and maintained.
- References to the decisions made by the review team to document their justifications for rejected or potential barriers.
- Details of where relevant good practice and judgment based on sound engineering and ergonomic principles have been taken into account in determining which risks are tolerable.
- A list of all the barriers that have been selected to reduce the risks, also highlighting which barriers are already in place and those to be put in place.
- A prioritized Remedial Action Plan to fully establish the remaining selected barriers, including identification of the required/responsible personnel for implementation.

Tolerability should be considered when a risk cannot be completely eliminated. Tolerability means a willingness to operate with some risk in order secure certain benefits and in the confidence that the risk is being correctly controlled. The risks are considered tolerable where:

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

Tolerability is considered to be achieved when the risk is reduced to a level at which the cost and effort (cost benefit) of further risk reduction is largely disproportionate to the achieved reduction of risk, as illustrated in diagram below Figure 10. However, to “tolerate” risk does not necessarily mean it is regarded as negligible or the risk can now be ignored; rather, it is a risk that must be kept under review and reduced further if and when it can be.



" A level of risk that is tolerable and cannot be reduced further without the expenditure of costs that are disproportionate to the benefit gained or where the solution is impractical to implement"

Figure 10: Risk-Cost Benefit

71.5 As Low as Reasonably Practicable (ALARP)

Land Rig Contractors should use As Low as Reasonably Practical (ALARP) as their reference for determining risk within their operations. Figure 11 illustrates the acceptable, ALARP, and unacceptable regions.

ALARP describes the level to which we expect to see workplace risks controlled. Using “reasonably practicable” allows us to set goals for duty-holders, rather than being prescriptive.

This flexibility is a great advantage, but it has its drawbacks, too. Deciding whether a risk is ALARP can be challenging because it requires rig operators to exercise sound judgment. In the great majority of cases, we can decide by referring to existing “good practice” that has been established by a process of discussion with interested parties to achieve a consensus about what is ALARP. For high hazards, complex situations, or novel situations, we build on good practice, using more formal decision-making techniques, including cost- benefit analysis, to inform our judgment.

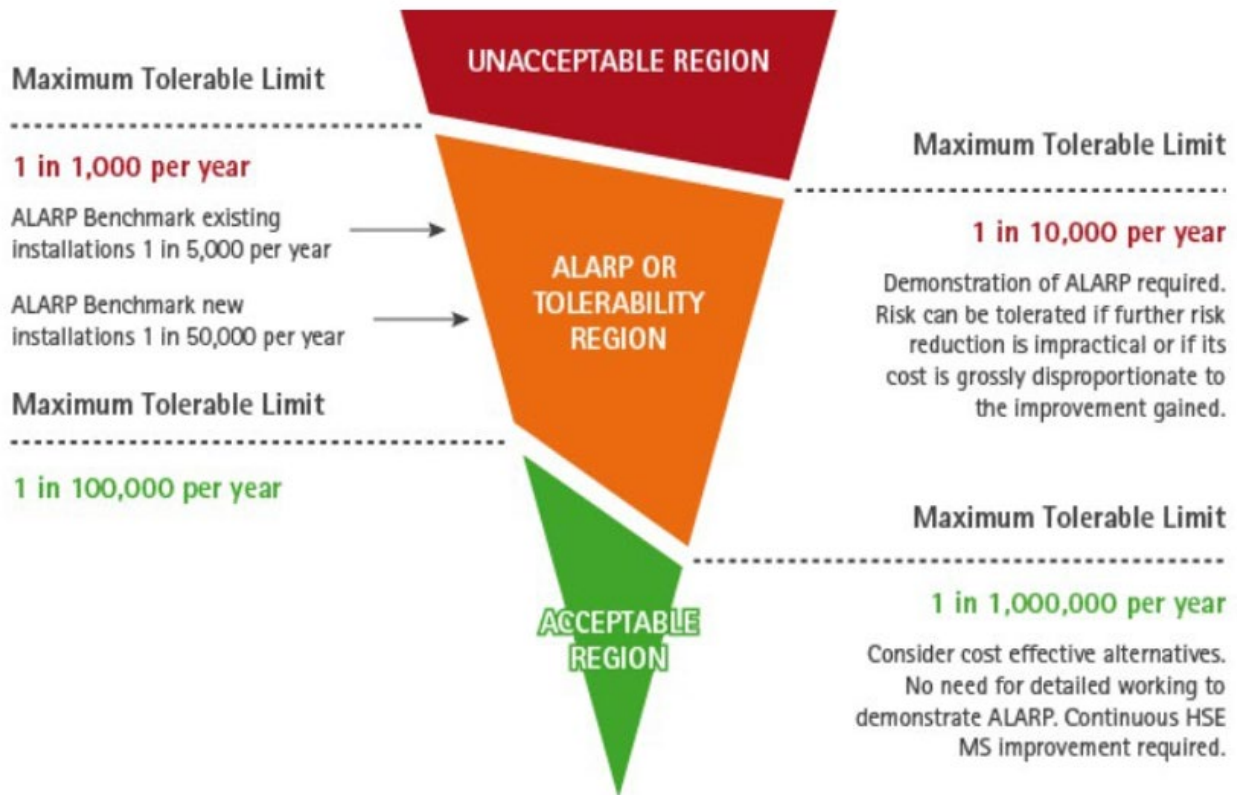


Figure 11: ALARP Regions.

Source: <https://www.epconsultenergies.com/>

71.6 Identifying Safety (HSE) Critical Tasks and MAHs

HSE Critical Tasks or activities are essential for maintaining the effectiveness of each identified SCE.

Personnel contribute to major accident risk both in positive and negative ways. Positively, they detect and correct failures in technical systems through, e.g., testing and maintenance; they diagnose and respond to system upsets and abnormalities in ways that computers are incapable of; and they perform other tasks that cannot be replaced by machinery and automation.

Negatively, as with technical systems, personnel are prone to error under certain circumstances, such as working under stress, lacking proper training, or operating with misleading procedures. This contribution happens through what is called HSE critical tasks, which in many ways can be considered the operational, or human, equivalent to SCEs.

Operational elements are considered safety critical because they represent operator tasks that play a direct role in realizing preventive or mitigating barrier functions.

For example, tasks required to ensure correct mud density and volume can be identified as an HSE Critical task because they are part of the barrier function “prevent well kick.”

The Drilling Contractor should identify the competent staff designated to maintain the SCE/Barrier. Each task may be a combination of the following:

- **Inspection and Maintenance:** To ensure the equipment/hardware maintains its integrity and reliability.
- **Operational:** To ensure that the equipment is used within the defined limits of the controls provided.
- **Administrative:** To provide the necessary training and awareness to ensure people to the required competency level and provide the necessary equipment and support for them to adequately perform the task.

IADC does not define competence, but for rig requirements, it should include having the necessary theoretical and practical knowledge and actual experience of the type of rig or facility to conduct the necessary inspections and maintenance and thus identify any defects or potential weaknesses.

The Drilling Contractor should have a documented Competence Management System (CMS) with a traceable means of assessment that clearly states the competence criteria and method of assessing the designated person with the HSE Critical Task.

At a minimum, the Competence scheme should contain the following elements:

- Competency criteria that is engineering-, discipline-, or SCE-specific.
- Detailed criteria to define competence (i.e., a combination of technical knowledge).
- Frequency of review and assessment.
- Definition of which lifecycle phase the person is considered competent for.
- If possible, a link to the competence program to demonstrate how the level of competence is increased.

The HSE Case should contain or refer to the following:

- List of the HSE Critical Activities/Tasks and Equipment/Systems.
- Details of the arrangements for verification of effectiveness for all HSE-critical activities/tasks and equipment/systems against the established performance standards.
- Details of the arrangements for tracking to completion any actions arising from verification.

72.0 Safety Critical Elements (SCEs, or Barriers)

Safety-critical elements (SCEs) are any structure, equipment, system (including computer software), or component part whose failure could cause or substantially contribute to a major accident, or whose use is intended to prevent or limit the effect of a major accident.

The safety-critical element not only includes the specified equipment, but also any other SCE required for the equipment to perform its specified safety function, including electric and hydraulic power supplies and connections.

Each SCE should be selected based on the following criteria:

- Consequences of failure of the item.
- Elements that contribute substantially to preventing or reducing, risks from Major Accident Hazards (MAH).
- Elements that contribute substantially to controlling or mitigating the effects of a MAH.

Each SCE identified should be grouped into the relevant barrier that will prevent or limit the consequence of a Major Accident Hazard or Event.

The HSE Case, at a minimum, should ensure that each SCE is identified/grouped using the generic barrier groups: (See Figure 12: Swiss Cheese Model.)

- Structural Integrity
- Process Containment
- Ignition Control
- Detection Systems
- Protection Systems
- Shutdown Systems
- Emergency Response
- Life Saving

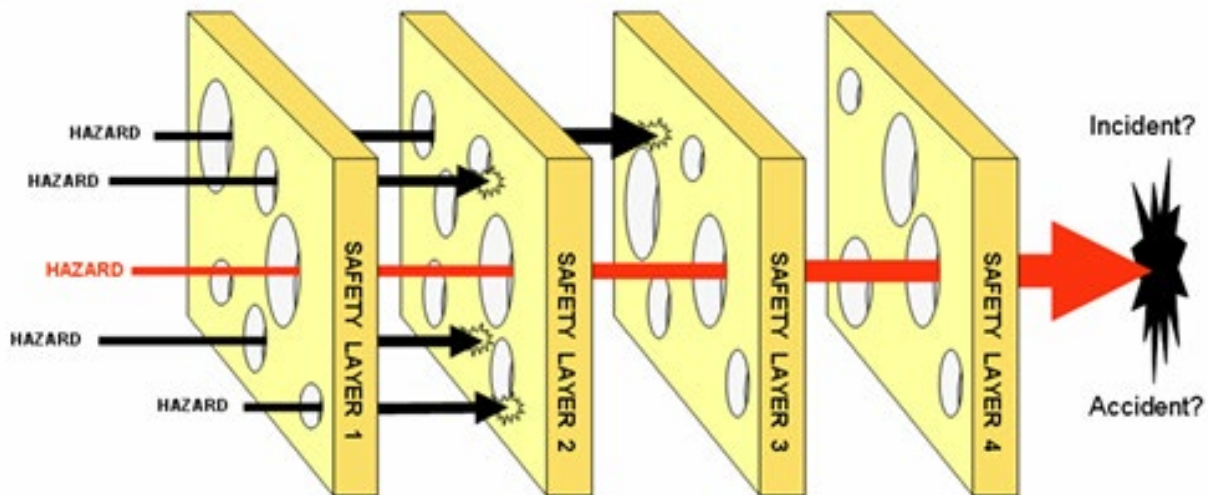


Figure 12: Swiss Cheese Model

Source: Jacobs Carter Burgess Presentation for Austin Bergstrom International Airport

https://www.faa.gov/sites/faa.gov/files/airports/airport_safety/safety_management_systems/external/ausSRMtraining.pdf

Each Major Accident Hazard (MAH) is established through Hazard Identification Study (HAZID). Each MAH should be analyzed to identify the required means to manage the associated risks. The HAZID process used by each Drilling Contractor to identify the MAH, associated risks, and SCE should be demonstrated or referenced as part of the HSE Case.

Typical examples of SCEs and relevant associated equipment (sometimes referred to as sub-elements) include but are not limited to those listed below.

72.1 Structural Integrity (SI)

- Critical structures whose failure could lead to a multiple fatality accident.
- Structures supporting equipment where loss of integrity could result in an escape of hazardous material with the potential to cause fatality and/or damage the environment.
- Structures designed to protect other structures or equipment from the full force of an impact which otherwise has the potential to cause major accidents, e.g., boat fenders / riser guards
- Lifting equipment and systems, jacking systems whose failure could lead to or contribute to a major accident.

72.2 Process Containment (PC)

- Equipment, piping, and pipelines where loss of integrity could result in an escape of fluid under pressure or hazardous material with the potential to cause harm to people and/or the environment.
- Integrity protection systems such as relief valves, instrumented protective systems, and bursting discs that protect the equipment from loss of containment as a result of exceeding design conditions.

72.3 Ignition Control (IC)

- Area classification systems and procedures designed to prevent ignition in case of an escape of flammable material. This also includes ventilation systems that may be necessary to maintain the correct area classification.
- Miscellaneous ignition control components such as flame arrestors, spark arrestors, etc.
 - Hazardous. Area Ventilation
 - Non- Hazardous. Area Ventilation
 - Certified Electrical Equipment
 - Earth Bonding
 - Flare Tip Ignition
 - Fuel Gas Purge System Miscellaneous Ignition Control Chemical Tank Inert System

72.4 Detection Systems (DS)

- Detection equipment and systems designed to alert the operators of an escape of hazardous material and possibly to initiate various control actions.

- Portable gas-monitoring and gas-testing equipment, used either to supplement, or to complement fixed equipment and systems, or for certifying safe conditions of work, e.g., prior to undertaking hot work or confined space entry under Permit to Work (PTW).
 - Fire and Gas Detection System
 - H₂O in Condensate

72.5 Protection Systems (PS)

- Fire and explosion suppression equipment and systems where people could otherwise be at risk.
- Firefighting equipment and systems.
- Incident control equipment such as water sprays, foam systems.
- Equipment and systems designed to mitigate the consequences of fire and explosion such as fire walls, blast walls and passive fire protection.
- Other equipment and systems, which play a significant role in preventing major accidents, such as navigational aids.
 - Chemical Injection System and other
 - Collision Avoidance
 - Deluge System
 - Fire/Explosion
 - Protection Navigational Aids
 - Power Management System
 - Sand Filter Firewater Pumps Firewater Ring main
 - PFP
 - FWS System/Sprinkler System
 - Fixed Foam System

72.6 Shutdown Systems (SS)

- Release control equipment and systems such as emergency shutdown, non-return valves, and blowdown, which are designed to limit the quantity of hazardous material involved in an incident.
- Well isolation equipment such as the SCSSSV, SSV, etc.
- Drilling well control equipment such as blowout preventer, mud weight control, etc.

72.7 Emergency Response (ER)

- Emergency power equipment and systems (emergency generators, switch gear, Uninterruptable Power Supplies (UPS), etc.

- Communications equipment and systems that alert people that an incident has occurred, and which can be used to provide instruction
- Equipment and systems that allow communication between emergency response teams and the emergency control center
- Equipment and systems that expedite the removal of people to a place of safety such as emergency lighting, escape routes, evacuation systems.
- Equipment and systems that allow communication with external agencies that can provide assistance in dealing with the incident.
- Secondary containment equipment and systems designed to restrict hazardous materials spreading from a spillage location into other areas.
- Weighing and measuring equipment and systems whose failure could lead to or contribute to a major accident such as gas meters, pressure/ temperature/level gauges, weighbridges.

72.8 Life Saving (LS)

Personnel protective equipment for general use in an emergency such as, breathing apparatus, and search and rescue equipment, etc.

- PPE
- Rescue Facilities
- Tertiary Means of Escape

These IADC HSE Case Guidelines do not give a prescriptive list or overview of what predefines Technical SCE and on which detail level they should be identified although they can be divided into two main categories:

1. Those that do and those that do not alter shape state or condition in order to perform a barrier function. The former is commonly referred to as active or functional barrier elements.
2. Latter is often called passive or structural barriers.

Active barriers can be characterized by being dependent on actions of an operator, a control system and/or some energy sources to perform their functions. Passive barriers refer to measures integrated into the design of the rig, and do not require operator actions, energy sources or control systems to perform their functions.

73.0 SCE Analysis Approach

Figure 13 gives a basic structured approach to SCE identification, Setting of the Performance.

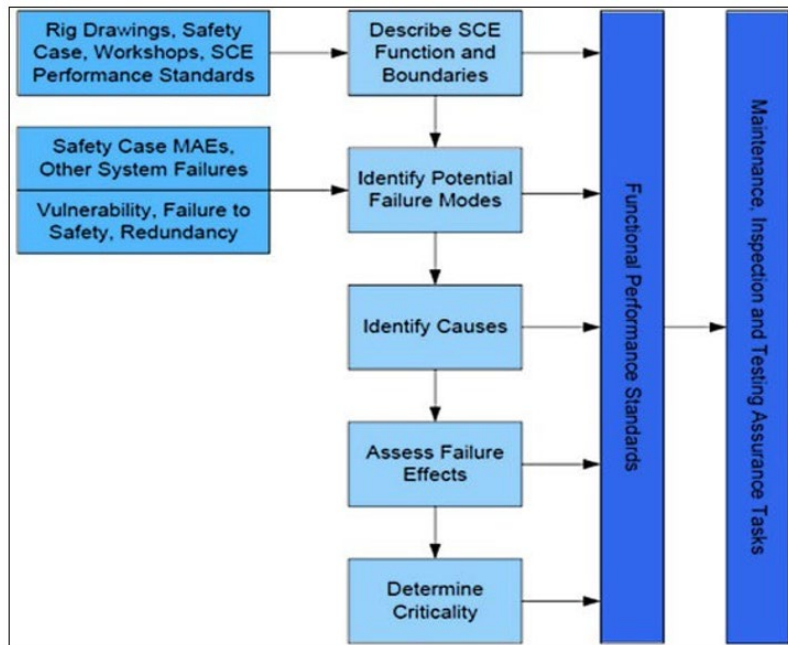


Figure 13: SCE Analysis Approach

The main output objectives from the above process are to identify the following:

- What is classified as a SCE?
- What does it have to do? (What is the functional requirement?)
- What do we need to do to ensure its reliability? (What are the Performance Standards?)
- How do we monitor and perform routine inspections (i.e., maintenance, inspection, and testing)?
- How do we verify to ensure compliance (i.e., quality assurance)?

73.1 Bowtie Methodology

In order to better understand and be aware of the rig's SCEs and their functions, a systematic approach should be demonstrated. In order for the rig crew to manage each SCE, the crew must first know what they are and what they do.

Each SCE/Barrier for an identified MAH should be presented using the “Bowtie” method. This diagram links all the SCEs/Barriers for a given MAH, which in turn allows the rig to adopt a systematic approach to the management of the SCEs/Barriers.

The bowties enable identification of safety barriers (prevention strategies) implemented to prevent a Top Event from taking place and/or to mitigate its effects. Preventive barriers mitigate Top Events and protective ones mitigate their consequences. See Figure 14.

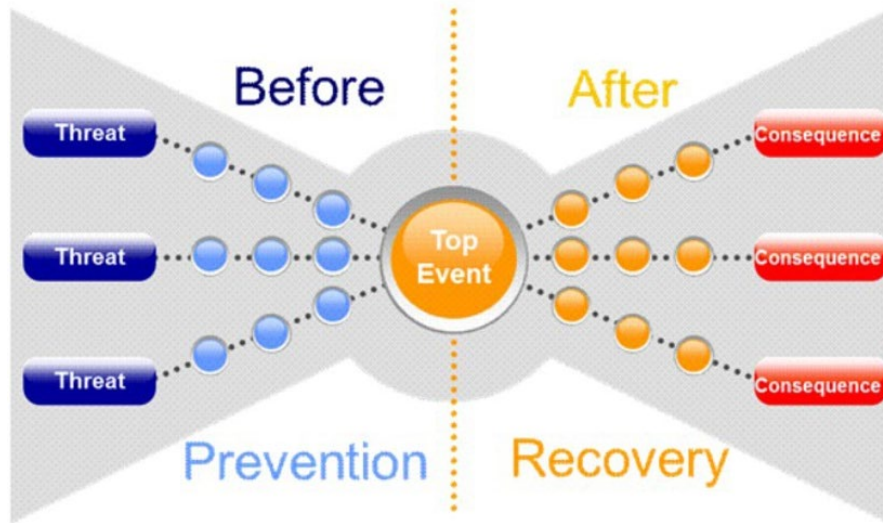


Figure 14: Bowtie Methodology. Source: <https://sitesafety.ca>

73.2 Performance Standards

Performance standards should be prepared for all SCEs. The performance standards are the parameters that are measured or assessed so that the suitability and effectiveness of each SCE can be assured and verified.

A five-step approach can be used as shown in Figure 15. This approach can help to ensure that performance standards are in place and being measured.

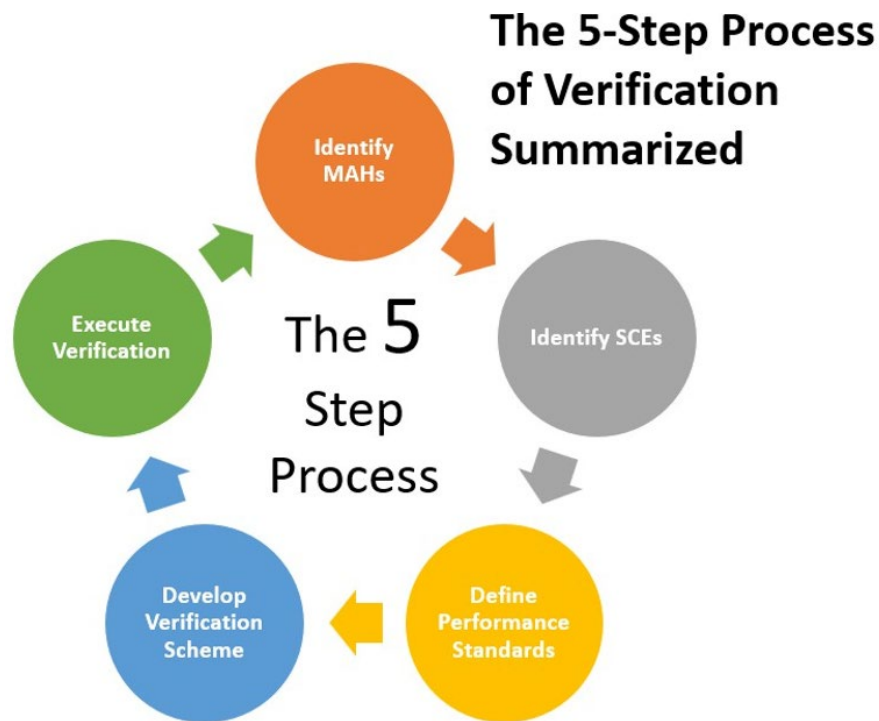


Figure 15: The 5-Step Process of Verification Summarized

Through the development of Performance Standards, the Drilling Contractor should demonstrate a competent understanding of the MAH controls in place based on measurable evidence. By developing the performance standards within the HSE Case, the Drilling Contractor can demonstrate the following:

- They fully understand what the performance criteria is for each MAH Control.
- That the maintenance and testing is fully implemented to demonstrate that these performance standards can be met.

Therefore, in basic principle, “This is what the control is designed to do” and “This is how we demonstrate through testing/maintenance, etc. that it actually does it.”

The performance standard process and associated standard should be developed for each identified SCE.

73.2.1 Developing Performance Standards

When developing the performance standards, the following criteria should be met:

- Functionality, what the control measure must do and the criteria it must achieve.
- Reliability, assuring its functional capability.
- Survivability, will it continue to function, if required after a hazardous event has occurred.
- Dependency, what other control measures are required to maintain/allow its functional capability.

How the above criteria is or will be assured should also be considered, e.g., Design/Technical review, QA/QC, maintenance, inspection, and testing or audits, etc.

The following should be observed in the setting of Performance Standards:

- Each criterion, including minimum acceptance criteria, should be justified.
- It should be encouraged to use and reference design standards and codes where this is relevant. For example, the Code used to design the SCE, or that governs the testing frequency, e.g., API RP 520 for sizing of relief valves, EEMUA 188 for establishing operating periods of relief valves. This may be relevant throughout the asset lifecycle.
- HSE Case supporting studies such as Fire and Explosion Risk Assessment (FERA) and Quantitative Risk Assessment (QRA) should be reflected in the Performance Standard criteria, e.g., FERA should provide information for the required fire water demand in respect to the largest potential scenario.
- Clearly measurable criteria, which can be confirmed during routine operations, maintenance, testing, or inspection is needed. Where acceptance criteria are obscure or ambiguous, they cannot practicably be assured. This can lead to confusion and loss of confidence in the SCE management process.

- Lifecycle phases should be separately considered but should be combined into a single Performance Standard document. This is to provide traceability across the entire lifecycle of the SCE.

The specific performance standard should ensure that all SCEs meet the following criteria:

- Are suitable and fully effective for the type hazards identified.
- Have sufficient capacity for the duration of the hazard or the required time to provide evacuation of the rig.
- Have sufficient availability to match the frequency of the initiating event.
- Have adequate response time to fulfil its role.
- Are suitable for all operating conditions.”

Table 8 demonstrates the performance requirement for active fire water systems:

Table 8: The Performance Requirement for Active Fire Water Systems

Fire Water System		
Performance Criteria	Basis	Performance Verification-Assurance Tasks
Function 1: To provide firewater storage and supply for main and emergency fire pumps in sufficient quantities		
1. The firewater tank shall be maintained at minimum 2/3 full	Design Basis	<p>Test generator cooling pump #2 cross over valves to supply the emergency fire water pump directly. Confirm actuation results in water flow from appropriate pumps (Procedure or maintenance # link)</p> <p>Function test level control alarm for firewater tank (Procedure of maintenance # link)</p> <p>Who does these tasks?</p> <p>Link to Safety Critical Tasks.</p>
2. The generator cooling pump #2 can be switched over manually to provide water directly to the suction of the emergency fire pump.	Design Basis	<p>Test operation of air conditioning cooling water pump automatic cross over valves to supply emergency fire water pump directly.</p> <p>Confirm actuation results in water flow from appropriate pumps (Procedure or maintenance #)</p> <p>Test generator cooling pump #2 cross over valves to supply the emergency firewater pump directly. Confirm actuation results in water flow from appropriate pumps. (Procedure or maintenance #)</p> <p><i>Link to Safety Critical Tasks for all required tasks.</i></p>

Performance Criteria shows what the system requirements are; Basis is what the Performance Criteria is developed against, i.e., Design, Regulations, rules, etc.; Performance Verification is how each function is verified and how it is assured.

The performance verification should also contain the relevant links to the Procedure or Maintenance Task or Schedule. Table 9 provides the process for Function 2, To Supply the Fire water at the required pressures and flow rate.

Table 9: The Performance Requirement for Active Fire Water Systems

Fire Water System		
Performance Criteria	Basis	Performance Verification-Assurance Tasks
Function 2: To provide firewater storage and supply for main and emergency fire pumps in sufficient quantities		
General service pumps maintain ring main pressure at 7 bar and can deliver water at a rate of 100 tonnes per hour @ 64m head. Fall in ring main pressure alarms in Control Room between 4.5 – 4.8 bar.	Design Basis	Test ring main pressure sensor and alarm at the Control Room. (Procedure or maintenance #) Link to Safety Critical Tasks
The general service pump provides firewater to ring main at a rate of 100 tonnes per hour @ 64m head. It can deliver at least one jet simultaneously from any two fire hydrants, hoses, and 19mm nozzles while maintaining a minimum pressure 3.5 bar at any hydrant.	Design Basis/Class Rules	Verify general supply pump pressure at hydrant during function test. Confirm via pressure gauge on pump discharge (Procedure or maintenance #) Link to Safety Critical Tasks
The emergency fire pump provides firewater at the ring main at a rate of 120 tonnes per hour @120m head. It can deliver at least one jet simultaneously from each of any two fire hydrants, hoses, and 19mm nozzles while maintaining pressure of 3.5 bar at any hydrant.	Design Basis	Verify fire pump pressure at hydrant during function test. Confirm via pressure gauge on pump discharge. (Procedure or maintenance #) Link to Safety Critical Tasks
The emergency fire pump provides automatic, remote, and manual start ability to ensure firewater is supplied to the rig main firewater users.	Design Basis	Function test emergency fire pump for local start, remote start and automatic start on ring main low pressure. (Procedure or maintenance #) Link to Safety Critical Tasks

73.2.2 Performance Standard Process

Performance Standards need to be defined in a consistent and logical manner. It is likely that more than one parameter will be needed to detail the required performance of the SCE as a barrier. The codes, standards and specifications used in the original design of SCEs should be identifiable from the Performance Standards so that suitability can be maintained throughout the asset's life. Any other related key documents should also be referenced in the Performance Standard. Figure 16 shows the clear steps required to identify performance standards and complete verification.



Figure 16: Performance Standards Process

73.2.3 Performance Standards Criteria

- **Functionality**

Functionality defines the key duties that the SCE is required to perform. The minimum level at which that function is achieved must also be defined. Criteria is considered measurable where it is possible for a person carrying out an assurance task or activity to clearly understand what the critical requirement is and thus be able to measure or observe that the criteria are being met.

- **Reliability**

How likely is it to perform on demand? Those SCEs for which it is required to measure reliability during operations should be identified at the design stage. Reliability targets are set during the design phase based upon the safety studies carried out in support of the Rig Safety Case. When in the operation phase, the ability to meet this criterion is demonstrated by functional testing at appropriate intervals.

- **Survivability**

Will it continue to function, if required after a hazardous event has occurred.

The performance criteria for survivability must be defined if the SCE is required to operate in the event of a Major Accident. It should also state how long the system should continue to operate for. Each SCE should be considered against the defined MAH in the Rig HSE Case.

- **Dependency/Interactions**

What other control measures are required to maintain/allow its functional capability.

It should also be defined what other SCEs are required to function in order for the one in question to operate effectively. Systems of SCE's are often dependent upon each other in order that the MAH is mitigated.

73.2.4 Performance Standard Format

When reviewing the performance standards as part of the HSE Case acceptance process the drilling contract should not dictate which format the performance standards are to be presented in,

but it should be demonstrated that each of the above criteria have been addressed through a systematic process.

The following example demonstrates a template for a performance standard for operations phase, the template shows suggested layout not content.

73.2.5 Performance Standards Review

Review of performance standards should be periodically carried out. The purpose of this is to accomplish the following:

- Incorporate new learnings from the Drilling Contractors organization and other industry developments.
- Consider if they are still suitable as required by operator or the regulations, if bound by country of operations regulatory requirements.

To ensure the effectiveness of the reviews mixed teams of personnel should be used.

The Performance Standards should also be reviewed when operating parameters on the rig change, e.g., additional wells bringing more hydrocarbons or sour gas or modifications as in additional POB through further accommodation, etc. Further Guidance on review is detailed in Part 6 (Performance Monitoring).

73.2.6 Swiss Cheese Model

As outlined in the Risk Management Section of these guidelines the guidance refers within their Risk Management Process to the Swiss Cheese Model. The Swiss Cheese Model is one of the most acknowledged barrier models. The model builds on the principles of “defenses in depth” with a set of successive protection layers (barriers) preventing hazards from being realized and causing accidents to happen.

- Active Failures are caused by people (unsafe actions) or technology and have a direct influence on the accident causation, examples can be failure to operate a BOP in case of a well kick or a fire damper that fails to close when activated.
- Latent Failures are defects or flaws in the system that indirectly allows an accident scenario to develop. One example could be incorrect line-up of valves, e.g., a maintenance task which at a later stage may cause flow of hydrocarbons to undesired locations.

Throughout the lifetime of a rig, holes in this model are expected to constantly move and change sizes depending on the type of operation, asset management, external environments etc. For a major accident to happen, holes in the Swiss Cheese Model need to align allowing for an “accident trajectory.” The strength of the Swiss Cheese Model is how it exemplifies and promotes the following strategy for management:

- Each barrier should either prevent hazards from being realized or escalation of the event.
- If one barrier fails, the subsequent barrier comes into play.
- Barriers should, as far as possible, be independent of each other.
- Barriers should be in place to reduce the risk to tolerable levels.

- No single failure should be able to cause a major accident.
- “Holes,” i.e., degradation in barrier performance should be as small and few as possible.

For this strategy to be successful, barrier needs to be managed in a way which ensures that they always perform as intended. This includes a comprehensive and common understanding from design and throughout operations of what constitutes barriers to hazards, and how barriers are verified, monitored, and maintained.

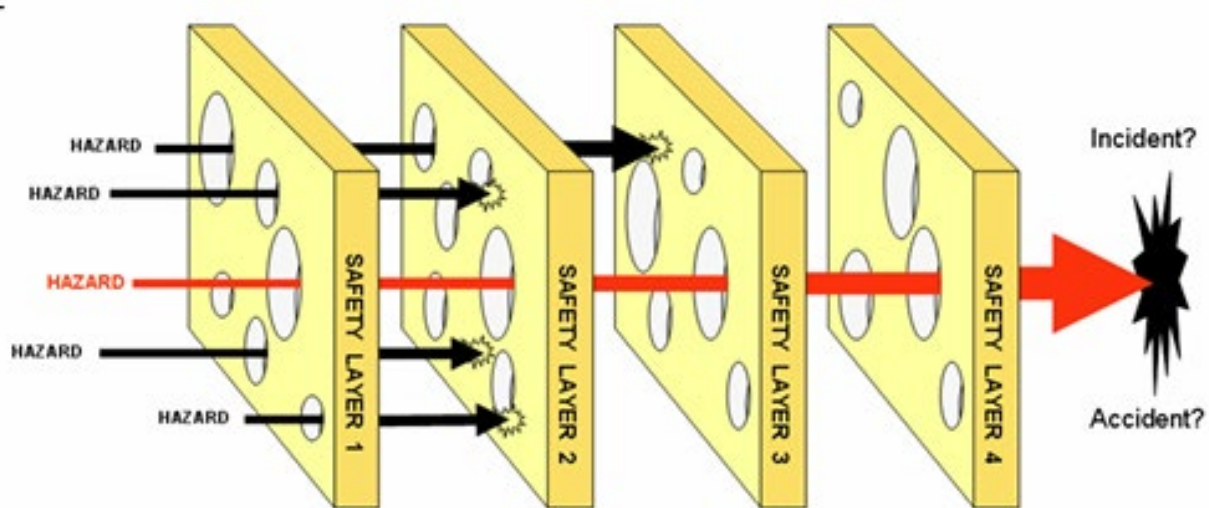


Figure 17: Swiss Cheese Model

Source: Jacobs Carter Burgess Presentation for Austin Bergstrom International Airport

https://www.faa.gov/sites/faa.gov/files/airports/airport_safety/safety_management_systems/external/ausSRMtraining.pdf

74.0 Environmental Risk Management

The HSE Case should identify and document in accordance with the risk management process all Environmental risks. These risks need to be identified in an Environmental Identification Workshop (ENVID).

74.1 ENVID Workshop

The ENVID specifically looks at the planned impacts on the environment and should be specific for certain regions of drilling. The workshop examines specific activities and determines what aspect of the environment could be affected. The ENVID is also concerned with accidental impacts, which are primarily defined in the HAZID.

The purpose of the Environment Identification (ENVID) process is for the early identification of aspects that can potentially impact the environment. Another key element of the process is the identification of proposed measures to prevent, control or mitigate the potential environmental hazards identified.

Environmental Hazards to consider:

- Topography
- Seismic Activity
- Quality
- Hydrology
- Air Quality
- Noise
- Flora
- Fauna
- Biodiversity
- Landscape
- Socioeconomic

74.2 Environmental Impact Assessment (EIA)

An Environmental Impact Assessment (EIA) can be developed as separate document to the HSE Case.

75.0 Occupational Risk Management

The HSE Case should consider the effects of occupational health effects.

In the drilling industry there are many tasks in which the health and capacity of a worker could have an impact on the safety of a task being conducted or could worsen the health conditions of the worker.

Occupational Hazards to consider in the HSE case:

- **Physical hazards** - A physical hazard is a factor within the environment that can harm the body without necessarily touching it. Vibration and noise are examples of physical hazards.
- **High temperatures** - Workers may be at risk of heat stress when exposed to hot environments or extreme heat. This can result in illnesses including heat stroke, heat exhaustion, heat syncope, heat cramps and heat rashes, or death. of workers from heat stress in a variety of hot environments.
- **Ergonomic hazards** - An ergonomic hazard is a physical factor within the environment that harms the musculoskeletal system. Ergonomic hazards include, among others, repetitive movement, manual handling, inappropriate workplace/job/task design, uncomfortable workstation height and poor body position, slips, trips, and falls.

- **Biological hazards** - Biological hazards are organic substances that pose a threat to the health of humans and other living organisms. They include pathogenic micro- organisms, viruses, toxins, spores, fungi, and bio-active substances.
- **Communicable diseases** - Communicable diseases are infectious diseases transmissible from person to person by direct contact with an affected individual or the individual's discharges or by indirect means.
- **Chemical hazards** - Hazardous chemicals in the workplace are substances, mixtures and materials that can be classified according to their health and chemical risks and dangers. Such hazards include skin irritants, carcinogens or respiratory sensitizers that have an adverse effect on a worker's health as a result of direct contact with or exposure to the chemical, usually through inhalation, skin contact, or ingestion. For example:
 - Drilling fluids
 - Silica
 - Diesel oils
 - Mercury
 - H₂S
 - Naturally occurring radioactive material (NORM)
- **Psychosocial hazards** - Psychosocial hazards include, among others, stress, violence, and substance abuse. There are circumstances in which work can have adverse consequences for health and wellbeing.
- **New and emerging risks** - The oil and gas industry utilizes advanced technologies. International labor standards such as Recommendation No. 197 highlight the importance of identifying new and emerging hazards and risks in the workplace.

76.0 Rig HSE Case Risk Management Review

Once the Rig HSE Case has been accepted, it should be subject to the criteria and arrangements for review and update.

The HSE Case risk management review is to be performed for:

- Changes in operation that significantly change the overall risk.
- Significant changes to manning levels or organizational structure.
- Significant Changes to the Drilling Contractors management System referenced in the case.
- Significant lessons learned from incidents.
- If operating in a country subject to HSE Case regulatory requirements, any changes in legislation/regulatory requirements.

- Expiry of specified Drilling Contractor specified review intervals.
- 5 years has passed without formal review of the HSE case.

77.0 Barrier Monitoring

It is crucial in managing major accident risk to capture early warnings of deterioration of the barriers and the effectiveness of other systems in place. These warning signs can be used to implement measures to improve the barriers or to adjust the activity level and operations in accordance with the deteriorated barrier performance.

This early warning means to identify the condition or the status of the barrier; where the holes are and how big they are. When identified the holes can be fixed or the activity level can be adjusted so the hazard does not penetrate a hole.

To ensure that barrier effectiveness is monitored the Drilling Contractor should ensure that:

- Information relevant for assessing the status of a barrier is identified.
- A process to evaluate and communicate the status is in place.
- Purpose and use of information about barrier status are identified related to planning, operating, and maintaining the rig.
- Assess and identify the integrity of well equipment and structures.

When establishing a monitoring system, a recommended approach is to map already available information in existing reporting monitoring system(s) and evaluate how this can be utilized directly or be made available with a minimum of modifications.

78.0 Visual and Practicable Use

It is critical that all levels of Company and Rig personnel understand the purpose and use of the Rig HSE Case this is achieved by visibility of use at inductions, meetings and daily planning.

A basic introduction into the purpose and use of the Rig OHSEMS should be included in the rig induction process for all personnel arriving at rig site. This should ensure that all personnel arriving on the rig are aware of:

- What the MAH are on the rig.
- Where the MAH may occur.
- The key management provisions/barriers they should be aware of.

Each relevant Bowtie and associated HSE Critical Tasks should be adapted for ease of use and understanding by the rig crew. This should include visual display of the Bowtie's at the relevant work areas or listing of the critical barriers for verification and documented listing of HSE Critical Tasks to be performed on a daily, weekly, or monthly basis depending on the phase of operation.

The Rig HSE Case should be utilized when performing any High-Level Risk Assessment process to ensure no barriers are being compromised or if so, then sufficient mitigation has been implemented to ensure the risk remains at tolerable levels.

Any modifications or deviations from the Rig HSE Case should be managed through the Management of Change process with the appropriate level of management approvals.

79.0 Incident Investigation

Following any High Potential Incident or Major Event, the HSE Case should form part of the Terms of Reference for the resulting incident investigation the aim being to:

- Review the barriers and controls in place.
- Ascertain if the barriers and controls were actually in place.
- Ascertain if the barriers and controls were maintained and in good state of repair.
- Ascertain if any barriers or controls were compromised.
- Ascertain if additional barriers or controls are required.

Following the incident investigation any recommended actions or revisions to the Rig HSE Case should be communicated to the appropriate level of management for change and tracked to closure through the remedial action plan. Although any required immediate preventative actions out with the HSE Case requirements should be implemented immediately through the MOC Process.

Part 5: Emergency Response

80.0 Introduction

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

Part 2, Part 3, and Part 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 Part 2 and 5. The equipment and systems must be considered in Part 4.

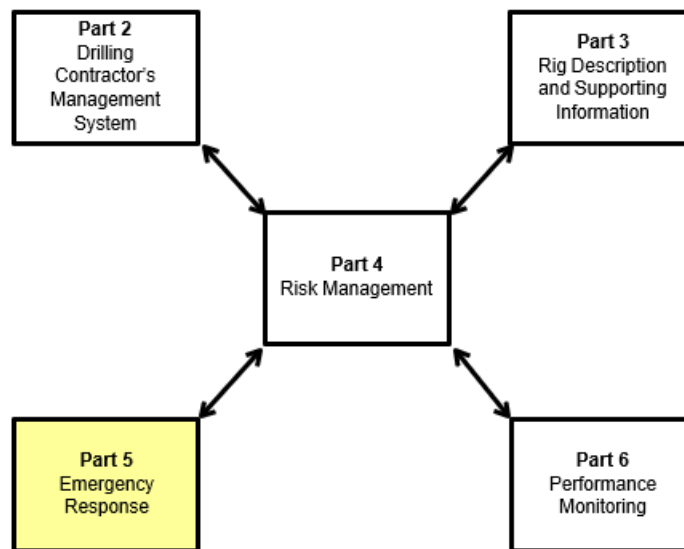


Figure 18: HSE Management Assurance: Emergency Response

To provide assurance that the Drilling Contractor is managing HSE effectively, Part 2, Part 3, Part 5, and Part 5 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.
- Details of emergency equipment.
- Means of recovery to a place of safety.

81.0 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 19.)

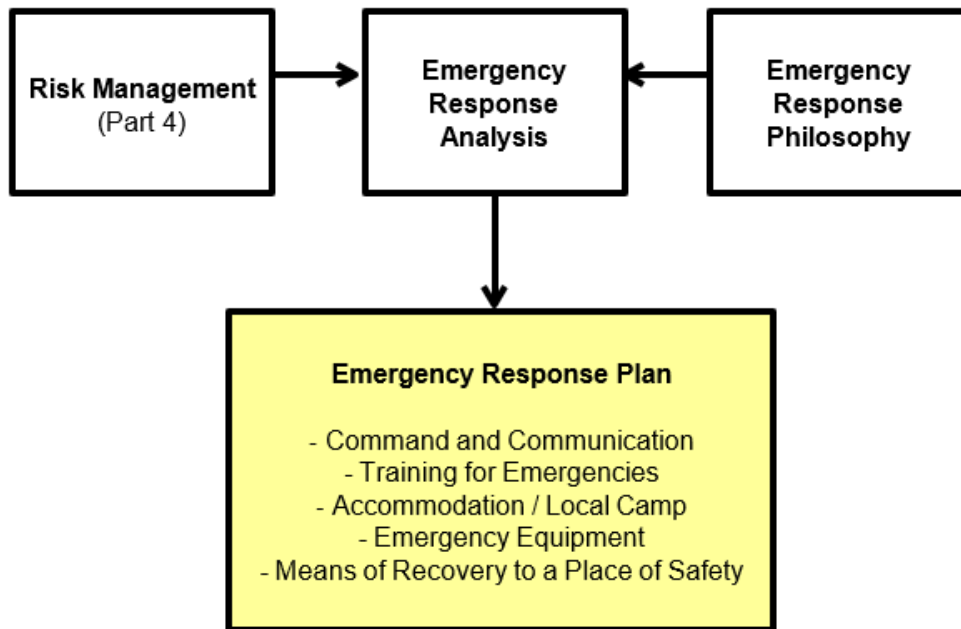


Figure 19: Emergency Response Management

81.1 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 the following:
 - Ensuring the safety of personnel during an emergency.
 - Provision of facilities and equipment for rescuing and treating the injured.
 - Rescuing personnel from the 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 others that this objective can be achieved?

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

81.2 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 rig. (Drilling Contractor's Hazard Register Table 6.)

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 include input from rig crew members with the appropriate knowledge and experience.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

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

81.3 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 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 rig are fully:
 - Competent to perform their ER duties.
 - Aware of the content and relevance of the plan.
 - Aware of their specific roles and responsibilities.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- Confirmation that the Emergency Response Plan contains relevant information from the Emergency Response analysis (See 81.2: Emergency Response Analysis).
- Description of the process for revising and updating the emergency response plan.
- Details of the involvement of 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
 - Fire and Explosion
 - Extreme Weather
 - Transport / Vehicle Collision
 - Rescue from any Confined Space
 - Rescue from Heights
 - Search and Rescue for a Missing Person

- Hydrogen Sulfide (H₂S).
- Health Incident (e.g., outbreak)
- Any Other Site-Specific or Location Emergency
- Well Control
- Loss of Stability or Structural Failure
- Loss of Control during Transit
- Foundation Failure
- Evacuation and Abandonment of Rig
- Emergency Notification
- Spill Response
- Total Power Failure
- Medical Emergency Response, including preventive pandemic precautions

82.0 Command and Communication

82.1 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 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 83.1: 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, medical equipment, and facilities for injured persons, etc.

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

- A display of the command-and-control hierarchy in an emergency situation as it will be reflected on site.
- Details of roles and responsibilities of key individuals including Drilling Contractor, Client, and other third-party personnel as appropriate in 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.

82.2 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 emergency response support team.
- Establishing client and location specific arrangements at the commencement of a contract and prior to any rig moves for:
 - External support responsibilities (private and public).
 - Standby equipment, vehicles, and facilities.
 - Oil spill response.
- Establishing interface requirements with the relevant local (municipal) and regional authorities as well as local emergency services.
- 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 others 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., local emergency services, 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 81.3: Emergency Response Plan.)
- Details of arrangements for Drill and Exercises including external emergency response support. (See 82.2: External Emergency Response Support.)

82.3 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:
 - Rig emergency command center and all areas on the rig.
 - Rig emergency command center and external support teams, local emergency services, and local (municipal) and regional authorities, 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 others that this objective can be achieved?

- Summary of the communication systems, including back-ups, on the rig. See the Communications section in Part 3.
- Description of the external emergency control / coordination center(s) for rigs.

83.0 Training for Emergencies

83.1 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 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 others 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 firefighting, pollution response, or medical treatment roles).
- See 11.3: Competence Assessment and Records.

83.2 Drills and Exercises

Objective

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

- Tests and develops the command and communication arrangements, including offsite 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 evacuate, escape, muster, etc.

How can this be achieved?

- Developing and implementing a drill and exercise program, based on the credible scenarios identified in Part 4, which will ensure that all procedures of the emergency response plan are practiced and tested for realistic potential incidents, including the command and control activities.
- 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 others that this objective can be achieved?

- Details of the emergency response drills and exercises program.
- 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.

83.3 HSE Inductions

Objective

To demonstrate that all personnel arriving at the rig are fully briefed on their responsibilities related to emergency response arrangements.

How can this be achieved?

- Ensuring that the HSE induction program includes:
 - Briefing on the rig emergency response arrangements (including individual responsibilities).
 - Demonstrations, as appropriate, of personal protective equipment, lifesaving appliances, etc.
 - Familiarization tour of the rig showing location of escape routes, muster points, etc.

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

- See 11.5: Induction Program.

84.0 Details of Emergency Equipment

84.1 Emergency Systems

Objective

To demonstrate that there are suitable and sufficient emergency systems available on the rig.

How can this be achieved?

- Providing equipment in accordance with applicable regulatory requirements.
- Carrying out an assessment of the emergency arrangements to:
 - Evaluate the times required for mustering and escape.
 - Determining the suitability of the equipment provided to meet regulatory requirements (e.g., size and numbers of equipment in relation to personnel at the rig site).
 - Determine the suitability of the systems and equipment for all foreseeable major incidents.
- Providing emergency systems and equipment to reduce risks to a tolerable level.

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

Description of the emergency arrangements with reference to emergency plans.

- Statement of compliance with regulatory requirements.
- Summary of emergency assessment, including mustering and escape times.
- See Section 83.2 Drills and Exercises, regarding the arrangements for verifying the mustering and escape times used in the assessments.

84.2 Means of Recovery to a Place of Safety

Objective

To demonstrate that suitable arrangements will be established to get people escaping from the rig site to a place of safety.

How can this be achieved?

- Identifying the preferred means of escape, e.g., foot, transport, etc.
- Establishing means for rescuing personnel, should the preferred method be unavailable.
- Establishing and approving site-specific emergency response arrangements with client, e.g., local emergency services, etc. (See 82.2: External Emergency Response Support).

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

- Statement of preferred means of escape.
- Description of the arrangements for rescuing personnel escaping from the rig site.
- Arrangements for developing and assessing client and site-specific rescue arrangements.
- Arrangements for obtaining support from both the private and public sector.

Part 6: Performance Monitoring

85.0 Introduction

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

Part 2, Part 3, and Part 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 to ALARP and 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.
- 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.
- Demonstrates a verification scheme for an operating rig showing whether the safety critical elements are suitable.

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 Part 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.

Part 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 Part 2, Part 3, and Part 5) are effectively **implemented** and that the effectiveness of the barriers will be maintained for the life of the rig. The Performance Monitoring HSE Management objectives in Part 6 must also be considered as barriers in the Risk Assessment in Part 4. See Figure 20.

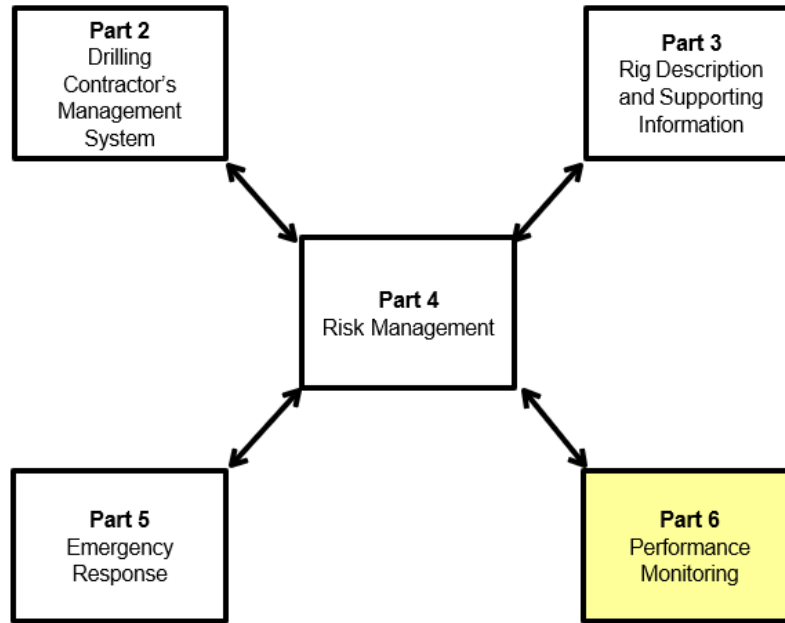


Figure 20: HSE Management Assurance: Performance Monitoring

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

Assurance that the safety critical elements are suitable and monitored needs to be demonstrated.

86.0 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 10.)

- 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, behavior-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.

Table 10: Performance Monitoring

Performance Monitoring	
Periodic Monitoring	<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
Audit and Audit Compliance	<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 rig's operation (ICP)
Verification Scheme of HSE Critical Activities/Tasks and Equipment/Systems	<ul style="list-style-type: none"> • Scope includes HSE Critical Activities/Tasks, Safety Critical Elements, (i.e., barriers that address Major Hazards) • Performed by: <ul style="list-style-type: none"> ○ Drilling Contractor personnel not directly responsible for the rig's operations, or ○ Personnel from a different organization i.e., regulator, classification society, client, third party, etc.

87.0 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 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 program of daily workplace inspections (including behavior-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 that provide an indication of current performance and act as indicators of future performance.
- Identifying reactive performance measures (incident analysis, management review, etc.) that 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 others that this objective can be achieved?

- Information on 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.

88.0 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 others 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.

89.0 Behavior-Based Observation Systems

Objective

To demonstrate that members of the workforce monitor HSE practices through a structured behavior-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 others that this objective can be achieved?

- Details of the behavior-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.

90.0 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 / camp site.
- 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 others 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.

91.0 Audit and Audit Compliance

Objective

To demonstrate effective arrangements are in place for Drilling Contractor's personnel not directly responsible for the 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 program.
- Establishing suitable arrangements for Drilling Contractor's personnel not directly responsible for the 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/System).
- Ensuring competent personnel not directly responsible for the 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 others that this objective can be achieved?

- Details of the audit scope including:
 - HSE barriers identified in Part 4 – Risk Management
 - Drilling Contractor's requirements
 - National Regulatory Requirements

- Certification 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.

92.0 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:

- Drilling Contractor personnel not directly responsible for the rig's operations.
- Personnel from a different organization, e.g., regulator, classification society, client, third party, etc.

How can this be achieved?

- Setting Up a Verification Scheme.
- Identifying HSE critical activities/tasks and equipment/systems and setting performance standards. (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
- Ensuring Safety Critical Elements are suitably designed and constructed and maintained in good repair and condition.
- 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 rig's operations (may either be included or separate from the arrangements established in 91.0: Audit and Audit Compliance) 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 others that this objective can be achieved?

- List of the HSE critical activities/tasks and equipment/systems. (See Table 6: Typical Land Drilling Rig Hazards 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 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.

92.1 Rig Verification Scheme

The purpose of the scheme is to identify errors or failures in design or construction, which could compromise rig safety.

92.2 Appointing An ICP

Regulation 4 of the Petroleum Exploration and Extraction Regulations describes a person as being independent in the exercise of a function if:

- The function does not involve the examination of anything for which the person has or has had a level of responsibility that could compromise the person's objectivity.

- The function involves the examination of a thing and the person:
 - Is sufficiently independent of and separate from the line management of the thing to ensure that the person will be objective in the exercise of his or her function.
 - Is sufficiently free from any influence that could compromise the person's independence, including influence of an operational or a financial nature.
- An ICP considering initial verification of SCE suitability should consider the following:
 - Major incident/major accident hazard identification, and analysis of those to confirm credibility, and that nothing obvious has been excluded/missed.
 - SCE selection: methodology for selection; adequacy of list.
 - performance standards.
 - SCE conditional review, with specific consideration of construction and commissioning processes.

92.3 Ongoing Suitability Verification

Verification of SCEs by an ICP is not a one-off activity.

Ongoing verification (updated reports) by an ICP are required. After verification of initial suitability, ongoing monitoring of suitability of SCEs is required in accordance with the regulations.

Examples of assurance activities during ongoing operations include the following:

- Inspection, maintenance, testing, and repair.
- Identification and remedy of failures, degraded performance, deviations, and deferred assurance activities.
- Investigation of unanticipated demands on SCEs.
- Analysis and reporting of SCE performance.

The review of information to confirm SCE suitability and that the SCE will remain effective, in good repair and condition, relies on the competency of the verifier (the ICP). This includes taking into account the operator's HSE management system, and the processes to manage the SCE.

Facility and process changes may impact ongoing suitability of SCEs. Where a change or modification at a facility has occurred, additional work may be necessary to ensure that the performance of the SCE has not been compromised, and it still delivers the required safety function, availability, and reliability, that is, formal management of change procedures by competent workers should be applied.

- SCE performance and condition review: conditional monitoring; visual inspection; review of reliability/ availability of records; evaluation of maintenance records; examination of failure rates; assessment of actions management from inspections.
- Management of equipment changes/modifications.

93.0 Performance Standards

As described in Part 4, performance standards need to be in place for all major incident/accident control measures, and this includes safety critical elements.

A performance standard describes the objective and performance criteria that the SCEs are assessed against. The performance criteria are normally defined by taking into consideration functionality, availability, reliability, survivability, and interaction aspects along with the associated assurance activities and pass/fail criteria.

The ICP should verify the following:

- That a performance standard exists for each SCE.
- That the SCE achieves the requirements of the performance standard.

If the ICP is unable to verify an SCE as suitable and/or maintainable, due to for example missing information, they should make the rig operator aware of their findings as soon as practicable. When an operator becomes aware of an SCE verification issue or finding, it should be addressed as a priority.

Addressing the verification finding(s) may in some instances mean replacement of the SCE with one that can be verified as being suitable. In some circumstances, it may necessitate the temporary shutting down of the facility until such time as a risk assessment and appropriate actions can be completed for the safe operation of the facility or rig.

94.0 Rig Certification

Objective

To demonstrate the following:

- The rig complies with National requirements.
- The rig complies with certification requirements.

How can this be achieved?

- Maintaining National and certification standards and requirements.

What in the Drilling Contractor's Management System demonstrates assurance to others that this objective can be achieved?

- List of HSE critical activities/tasks and equipment/systems in the management system are related to Regulatory and Certification Requirements.
- Details on status of rig certification.

95.0 Management of Change (MOC)

The verification scheme must provide a description of how the verifier is informed of any SCE repairs, modifications, or new SCEs and specified equipment. It must also describe how the verifier

examines work in progress. Such means include the examination of documentation/certification, physical testing of equipment, witnessing of testing activities or review of associated maintenance records. In some circumstances, it may also be appropriate for the verifier to examine work during various stages of completion, including fabrication, construction, and repair.

Where there is a material change to a design notification, a relocation notification, the Drilling Contractor must refer the material change to the verifier for further comment in accordance with the verification scheme. The scheme should provide a description of this process and how it is initiated and managed.

The Drilling Contractor may repair, modify, or install new SCEs or specified equipment as part of a project. This may be managed by personnel within the Drilling Contractor who are not involved in the management of ‘day to day’ operational verification. Project work may also be managed by engineering service providers contracted to the Drilling Contractor. As such, different verifiers may be involved from the one appointed for operational verification. Examples may be specialist or project verifiers within the same body, or different verification bodies altogether. Those who manage such projects should be aware of, and competent in, the requirement to involve a verifier.

In practice, there should be some form of cross reference between the Drilling Contractor’s system for repair and/or MOC system and the verification scheme.

96.0 Well Examination Interface

The interface between the verification and well examination schemes must be properly managed. Since this interface is an aspect of the schemes that can be frequently overlooked, gaps can occur between the two schemes. The intent of well examination is to parallel a rig’s verification scheme. Verification and well examination schemes may not be merged because of the different Drilling Contractor structures for the rig and the wells. Nonetheless, some well equipment such as the Xmas trees and blowout prevention equipment are suitable for inclusion in either scheme. The verification scheme should consider the interface with well examination scheme and should capture the boundaries between examination and verification.

The Drilling Contractor must produce a written record of SCEs and specified equipment that are in place to prevent or mitigate the potential for a major environmental incident. This will include equipment to prevent the loss of well control.

In some instances, well control equipment may be temporarily used on a rig. In such cases, this equipment should also be identified as safety critical and be included within the verification scheme, and the verifier should be invited to comment on its suitability, repair, and condition. In particular, the verifier should observe how this temporary well control equipment interfaces with existing SCEs and specified equipment. This equipment is “temporary equipment,” but it should be recognized that its primary purpose is the prevention or mitigation of a major accident. As such, any temporary well control equipment should have appropriate standards of performance set for the conditions likely to be encountered during any well operations or interventions.

Appendix A: Reference Documents

A.1 International Standards & Industry Guidelines

1. International Organization for Standardization, ISO 1999 - Acoustics - Determination of occupational noise exposure and estimation of noise-induced hearing impairment. 2013
2. International Organization for Standardization, ISO/TS 29001 – Petroleum, Petrochemical and Natural Gas Industries Sector-specific Quality Management Systems – Requirements for product and service supply organisations. 2020.
3. International Organization for Standardization, ISO 14001 - Environmental Management Systems, specification with guidance for use. 2015.
4. International Organization for Standardization, ISO 14004 -, Environmental management systems - General guidelines on principles, systems and supporting techniques. 2016.
5. International Organization for Standardization, ISO 17776 - Petroleum and natural gas industries. Offshore production installations. Guidance on tools and techniques for hazard identification and risk assessment. 2016
6. International Organization for Standardization / international Electrotechnical Commission, Guide 73 - Risk management -- Vocabulary -- Guidelines for use in standards. 2009.
7. BS EN 61508-1:2010 General requirements, BS EN 61508-2:2010 Requirements for electrical/ electronic/ programmable electronic safety-related systems, BS EN 61508-3:2010 Software requirements, BS EN 61508-4:2010 Definitions and abbreviations, BS EN 61508-5:2010 Examples of methods for the determination of safety integrity levels, BS EN 61508-6:2010 Guidelines on the application of IEC 61508-2 and IEC 61508-3, BS EN 61508-7:2010 Overview of techniques and measures
8. IEC 61882, Dependability management - Hazard and Operability (HAZOP) Studies. 2016.
9. International Organization for Standardization / international Electrotechnical Commission, Guide 51 – Safety Aspects - Guidelines for their inclusion in standards. 2014.
10. International Organization for Standardization, Other International Standards as appropriate - refer to www.iso.ch.
11. American Petroleum Institute, Other API Standards & Technical Publications as appropriate - refer to <https://www.api.org/products-and-services/standards>.
12. European Standards, European Standards as appropriate - refer to <https://www.cenelec.eu/>.
13. International Occupational Health and Safety Management System Specification Iso 45001:2015.
14. International Association of Drilling Contractors, Drilling Manual. 2015.
15. Health & Safety Executive, Successful Health & Safety Management (HSG65). 2013.
16. Health & Safety Executive Offshore Information Sheet No. 3/2006 – Guidance on Risk Assessment for Offshore Installations.
17. Health & Safety Executive, Tolerability of Risk from Nuclear Power Stations. 1992.

18. International Association of Oil and Gas Producers (OGP), Guidelines for the Development & Application of Health & Safety Management Systems. 1994.
19. International Association of Oil and Gas Producers (OGP), Exploration & Production Waste Management Guidelines. 1993.
20. International Association of Oil and Gas Producers (OGP), Land Transportation Recommended Practice, Report No. 365, April 2005.
21. International Association of Oil and Gas Producers (OGP), Other OGP Publications as Appropriate -refer to <https://www.iogp.org/bookstore/>.
22. M. Middleton & A. Franks (2001) – “Using Risk Matrices,” The Chemical Engineer, September 2001.
23. Chemical Industries Association, A Guide to Hazard and Operability Studies, UK, 1987.
24. EU Guidance on Risk Assessment at Work; Luxembourg, Office for Official Publications of the European Communities, 1996, ISBN 92-827-4248-4.
25. UKOOA, Guidelines for Quantitative Risk Assessment Uncertainty-2000.
26. Health & Safety Executive: Reducing risks, protecting people HSE’s decision- making process – 2001.
27. Step Change, Guidance for Health and Safety Management Systems Interfacing (undated ca 2001).

A.2 National Legislation & Guidance

Netherlands

For information on Dutch Legislation, Standards and Guidelines see www.sodm.nl.

English translations of the Conditions of Employment Law are available from Alescon e-mail: info@alescon.nl.

UK

For information on UK Legislation, ACOP’s and Guidance <https://www.hse.gov.uk>.

Germany

For information on German Legislation & Guidelines see www.lbeg.niedersachsen.de.

Appendix B: Abbreviations and Definitions

B.1 Abbreviations

Abbreviations	
ACoP	Approved Code of Practice
ALARP	As Low As Reasonably Practicable
API	American Petroleum Institute
BA	Breathing Apparatus
Bbls	Barrels
BD	Bridging Document
BHA	Bottom Hole Assembly
BOP	Blow-out Preventer
BS	British Standard
CAA	Civil Aviation Authority
CE	European Conformity Assessment Marking
CMAS	Competency Management Scheme
CMAS	Competency Management System
COSHH	Control of Substances hazardous to Health Regulations, UK
CO ₂	Carbon Dioxide
DCR	Design and Construction Regulations, UK
DEA	Danish Energy Authority
DP	Dynamic Positioning
EER	Escape, Evacuation and Rescue
EEER	Escape, Evacuation and Emergency Response
EERA	Escape, Evacuation and Rescue Analysis
EI	Energy Institute, London
EIA	Environmental Impact Assessment
ENVID	Environmental Hazard Workshop
ESD	Emergency Shutdown Device
ETA	Event Tree Analysis
EU	European Union
F&G	Fire and Gas
FMEA	Failure Modes and Effects Analysis
FMECA	Failure Mode, Effect, and Criticality Analysis

Abbreviations	
FSA	Formal Safety Assessment
FTA	Fault Tree Analysis
GHA	Gross Hazard Analysis
HAZAN	Hazard Analysis
HAZID	Hazard Identification Study
HAZOP	Hazard and Operability Study
HC	Hydrocarbon
HPHT	High Pressure - High Temperature
HRA	Health Risk Assessment
H ₂ S	Hydrogen Sulphide
HSE	Health and Safety Executive, UK
HSE	Health, Safety, and Environment
HSEMS	Health Safety & Environmental Management System
HSWA	Health and Safety at Work Act, UK
HVAC	Heating, Ventilation, and Air Conditioning
IADC	International Association of Drilling Contractors
ICP	Independent Competent Person
IEC	International Electrotechnical Commission
IOGP	International Association of Oil & Gas Producers
IRF	International Regulators Forum
ISO	International Organization for Standardization
ISP	Incident Statistics Program
JHA	Job Hazard Analysis
JSA	Job Safety Analysis
Land Rig	Land Drilling Unit
Land Rig	Land Drilling/Workover Units
LPG	Liquefied Petroleum Gases
MAE	Major Accident Event
MA	Major Accident
MAH	Major Accident Hazard
MAR	Management and Administration Regulations, UK
MH	Major Hazard
MHSWR	Management of Health and Safety at Work Regulations, UK

Abbreviations	
MOC	Management of Change
MS	Management System
MSDS	Material Safety Data Sheets
NACE	National Association of Corrosion Engineers
NDT	Non-destructive testing
NGL	Natural Gas Liquids
NOGPA	Netherlands Oil and Gas Exploration and Production Association
OGP	International Association of Oil and Gas Producers
OHSEMS	Occupational Health, Safety, and Environmental Management System
OHSMS	Occupational Health and Safety Management System
OREDA	Offshore Reliability Data
OWH	Other Workplace Hazard
PA	Public Address
PEM	Physical Effects Modelling
PFEER	Prevention of Fire and Explosion and Emergency Response Regulations, UK
PHA	Preliminary Hazard Analysis
PIC	Person in Charge
PLL	Potential Loss of Life
PM	Preventative Maintenance
PMS	Planned Maintenance Systems
POB	Persons on Board
PPE	Personal Protective Equipment
PS	Performance Standard
PTW	Permit to Work
PUWER	Provision and Use of Work Equipment Regulations, UK
QA	Quality Assurance
QRA	Quantitative Risk Assessment
RAM	Risk Assessment Matrix
RIE	Risk Inventory and Evaluation
SCE	Safety Critical Element
SHIDAC	Structured Hazard Identification, Assessment & Control
SIF	Serious Incident or Fatality
SIMOPS	Simultaneous Operations

Abbreviations	
SMS	Safety Management System
SOOB	Summary of Operation Boundaries
SSoM	State Supervision of Mines, Netherlands
TOR	Terms of Reference
TR	Temporary Refuge
TRA	Task Risk Assessment
UPS	Uninterruptible Power Supply
WOAD	World Offshore Accident Database

B.2 Definitions

IADC recognizes the global variation in the meaning and understanding of commonly used terms in Risk Management. In an effort to overcome this and provide more clarity for Drilling Contractors and other users of this document, IADC has adopted the following definitions for the words and phrases used throughout this guideline. These definitions predominantly reflect those stated in International Standards referenced in Appendix A, of this guideline. In a few instances, industry accepted definitions have been added to address specific national and or regional terminology.

See also: <http://www.electropedia.org/> or <https://std.iec.ch/glossary>

Term	Definition
Activity	Work to be carried out as part of a process characterized by a set of specific inputs and tasks that produce a set of outputs to meet customer requirements.
ALARP (As Low As Reasonably Practicable)	A process for assessing the amount of effort and resources that should reasonably be applied to reduce risk. Reducing a risk to a level which is ALARP involves objectively determining the balance where the effort and cost of further reduction measures become disproportionate to the additional amount of risk reduction obtained.
Assurance	Represents the activities performed to ensure SCEs meet Performance Standards.
Auditing	A structured independent assessment of the efficiency, effectiveness, and reliability of the management system.
Availability	Probability that a system will operate on demand

Term	Definition
Barrier	<p>Measure that reduces the probability of releasing a hazard’s potential for harm or which reduces its consequences. (Barriers are Controls or Defenses.)</p> <p>The hierarchy of barriers is as follows:</p> <ul style="list-style-type: none"> • Prevention • Detection • Control • Mitigation • Emergency response <p>Other Related Terms and Definitions:</p> <p>ISO-17776 - Measure which reduces the probability of realizing a hazard’s potential for harm and which reduces its consequences.</p>
Blow-out	An uncontrolled escape of reservoir fluid.
Bridging Document	A documented plan that defines how diverse organizations agree on which safety management elements will be used when co-operating on a project, contract or operation.
Cause	Anything with the potential to release a hazard. Cause classes include (but are not limited to): thermal energy, chemical energy, biological energy, radiation, kinetic energy, electrical energy, climatic condition, uncertainty, or human factors.
Classification	A service provided by Classification Societies which establishes and administers standards, known as Rules, for the design, construction, and periodic survey of merchant ships and other marine and offshore structures. Classification certifies adherence to these Rules and means that a vessel possesses the structural and mechanical fitness required for its intended service.
Class Rules	Rules set by the Classification Societies and intended to ensure safety of lives, the protection of assets and the marine environment.
Competence	The ability to perform a particular job or task in compliance with the Performance Standard.
Consequence	<p>An event or chain of events that results from the release of a hazard.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – (Harmful Event) – occurrence in which a hazardous situation results in harm.</p>
Control (See also Barrier)	Barrier that reduces the probability of releasing the hazard’s potential for harm. (Preventing the Top Event.)
Control Measure	Any system, procedure, process, device, or other means of eliminating, preventing, reducing or mitigating the risk of land rig operations failure arising at or near a well. Control measures are the means by which risk to rig operations is eliminated or minimized. Controls can take many forms, including physical equipment, process control systems, management processes, operating or maintenance procedures, land rig contingency plans, and key personnel and their actions.


Term	Definition
Cost Benefit Analysis (CBA)	An analysis which evaluates the costs to be made versus the benefits obtained to reduce risk associated with an activity.
Defeating Factor	Condition that defeats a barrier, leading to increased risk.
Defeating Factor Barrier	Measure put in place to prevent or mitigate the effects of a Defeating Factor.
Defense (See also Barrier)	<p>Barrier that reduces the consequences of the release of a hazard by limiting the chain of events arising from the Top Event.</p> <p>Other Related Terms and Definitions:</p> <p>IADC HSE Case Guidelines Issue 02 – (Control) - Means of intervention permitted by the design (e.g., pressure relief valves, emergency power supplies), hardware (e.g., dump tanks, coolant sprays), or the presence of manually or automatically initiated ESD procedures which are intended to contain a developing situation so that escalation to a major accident may be avoided.</p>
Diversity	The ability to perform the same function through a number of different and independent means.
Electrical Equipment and Power Systems	Electrical equipment and power systems include all plant and apparatus designed for the generation, conversion, storage, distribution, transformation or use of electricity.
Electrical Isolation	Electrical isolation is the secure, proven disconnection and separation of a circuit or item of equipment from every source of electrical energy.
Environment	The surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation.
Environmental Aspect	<p>Element of an organization's activities, products or services that can interact with the environment.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO-17776 – Element of an organization's activities, products or services that can interact with the environment. [ISO 14001] • IADC HSE Case Guidelines Issue 02 – Element of an organization's activities or services that can interact with the environment.
Environmental Impact	<p>Any change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO-17776 – Any change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services. [Also ISO 14001]. • IADC HSE Case Guidelines Issue 02 – Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organizations activities or services.
Environmental Significance	A threshold criteria for judging the significance of an environmental aspect.

Term	Definition
Escalation	<p>Spread of the impact of a hazardous event to equipment or other areas, thereby causing an increase in the consequences of the event.</p> <p>Other Related Terms and Definitions:</p> <p>ISO-17776 – Spread of the impact of a hazardous event to equipment or other areas, thereby causing an increase in the consequences of the event.</p>
Escape	<p>The process of leaving an offshore installation in the event that part, or all, of an evacuation and / or communication system fails, whereby personnel on the MODU make their way directly to the sea.</p>
Evacuation	<p>The planned method for leaving an offshore installation in an emergency e.g. helicopter or TEMPSC.</p>
Fatal Accident Rate (FAR)	<p>The number of calculated fatalities that will occur for every 100 million man-hours worked.</p>
Failure Modes and Effects Analysis (FMEA)	<p>A hazard identification technique in which known failure modes of components or features of a system are considered and undesired outcomes are noted. FMEA is related to Fault Tree and Event Tree Analyses.</p>
Functional Requirements	<p>Minimum criteria which should be satisfied to meet the stated health, safety and environmental objectives.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO-17776 – Minimum criteria which should be satisfied to meet the stated health, safety, and environmental objectives • IADC HSE Case Guidelines Issue 02 – (Risk Acceptance Criteria) – A description of the target performance, to satisfy objective corporate policy, with regard to the safe and efficient operability and functionality of the installation, facility, or unit as a whole, or major systems within it. • IADC HSE Case Guidelines Issue 02 – (Health, Safety, and Environmental Performance Criteria) – Standards or benchmarks, quantified where possible, that provide measures against which an organization can determine the degree to which they are succeeding in managing risks, and hence in meeting their objectives.
Functionality	<p>The ability of a system to perform its specified role. This may be characterized and demonstrated by identifying critical functional parameters.</p>
General Workplace Practices	<p>Routine practices that are common to many industries and businesses, e.g., operations in construction and maintenance. Local regulations or industry standards often exist for the practice or elements of the practice.</p>
Harm	<p>Physical injury or damage to the health of people, or damage to property or the environment.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO Guide 73 – Physical injury or damage to the health of people, or damage to property or the environment. • IADC HSE Case Guidelines Issue 02 – The damage, injury, or ill-health, whether physical or mental, inflicted upon animate or inanimate objects.

Term	Definition
Hazard	<p>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, production losses, or increased liabilities.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO-17776 – Potential source of harm (also in ISO Guide 51). • IADC HSE Case Guidelines Issue 02 – The intrinsic property or ability of an agent with the potential to cause harm, including ill-health and injury, damage to property, plant, products or the environment, production losses, or increased liabilities.
Hazard Hierarchy	<p>A checklist of hazards, consequences and sources which may be used, as appropriate, for risk assessment (risk identification and assessment). Before using the checklist, it should be reviewed to confirm that is appropriate and complete for the intended application.</p>
Hazard Identification (HAZID)	<p>A process to find, list, and characterize hazards. A qualitative technique for the early identification of potential and threats effecting people, the environment, assets, or reputation.</p>
Hazardous Activity	<p>Activity or task which exposes the person(s) carrying out the task to a hazard. E.g., working at height, welding, etc.</p>
Hazardous Event	<p>Incident which occurs when a hazard is realized. (Not all Hazardous Events are Top Events; Hazardous Events can also be Consequences.) ("Harmful Event" in ISO Guide 73.)</p> <p>Other Related Terms and Definitions:</p> <p>ISO-17776 – Incident which occurs when a hazard is realized.</p>
Hazardous Operation	<p>Operation with the potential to release one or more Major Hazards or defeat Barriers for one or more Major Hazards.</p>
Hazardous Situation	<p>Circumstances in which people, property or the environment are exposed to one or more hazards.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Circumstances in which people, property or the environment are exposed to one or more hazards.</p>
Hazards Register	<p>Brief, but complete, summary that demonstrates that hazards have been identified, assessed, and that barriers (both controls and defenses) are in place.</p> <p>Other Related Terms and Definitions:</p> <p>ISO-17776 – Document providing a brief, but complete, overview of the identified hazards and the measures necessary to manage them.</p>
HAZID	<p><i>See Hazard Identification.</i></p>
HAZOP	<p>Methodology used to identify major hazards or operability issues related to the design, installation, and operation. The focus of the study is to address incidents, which may impact on public health and safety, worker safety economic loss, the environment, and the oil field or upstream unit's reputation.</p>

Term	Definition
HSE Case Guidelines	These HSE Case Guidelines for Land Drilling Units are intended to give further support for all Land Rigs Operations requirements in addition to IADC and give direction on effective development and implementation of measures of the Rig Health and Management System, specifically addressing in relation to Major Accident Hazard (MAH) prevention.
HSE Critical Activity	<p>Activity or task which provides or maintains Barriers. (These tasks may or may not be hazardous in themselves, e.g., monitoring alarms, gas detector testing, Permit-To-Work.)</p> <p>Other Related Terms and Definitions:</p> <p>IADC HSE Case Guidelines Issue 02 – Activity or task which exposes the person(s) carrying out the task to hazards [interpretation from context].</p>
HSE Critical System/Equipment	<p>Any part of an installation (system, equipment, software, etc.) which:</p> <ul style="list-style-type: none"> Has the purpose of preventing the release, or limiting the effect of, a major hazard, or which could cause, or substantially contribute to, the release of a major hazard if it failed. <p>Other Related Terms and Definitions:</p> <p>IADC HSE Case Guidelines Issue 02 – (Safety Critical System/Element) – Such part of an installation and such of its plant (including computer programs), or any part thereof: a) the failure of which could cause or contribute substantially to; or b) the purpose of which is to prevent, or limit the effect of; a major accident.</p>
HSE Management Objectives	The goals, in terms of health, safety, and environmental performance that an organization sets for itself to achieve.
HSEMS	A formalized HSE management system for the operation of the rig incorporating all aspects of good HSE Management.
Human Error	Intended and unintended behavior by people that results in an action, omission, or occurrence that directly causes a Barrier to become ineffective or to fail.
Human Factors	The interactions between people, the organization and the plant, equipment, and systems that they interface with. It is also sometimes defined as “fitting the work to the worker” or “the science and practice of designing systems to fit people.”
Incident	<p>Event, or chain of events, which cause, or could have caused, injury, illness and/or damage (loss) to assets, the environment or third parties.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> ISO-17776 – Event, or chain of events, which cause, or could have caused, injury, illness and/or damage (loss) to assets, the environment or third parties IADC HSE Case Guidelines Issue 02 – Includes all undesired circumstances and occurrences that have the potential to cause accidents. IADC HSE Case Guidelines Issue 02 – (Accident) – Includes any undesired circumstances which gives rise to ill-health or injury, damage to property, plant, products, or the environment.

Term	Definition
Individual Risk Per Annum (IRPA)	The probability that an individual will become a fatality each year.
Interested Party	Anyone with an interest or investment in a project, organization, or outcome, such as employees, customers, investors, or regulators. Formerly referred to as a stakeholder.
Major Accident	An occurrence—including in particular a major emission, fire, or explosion—resulting from uncontrolled developments in the course of the operation of any establishment and leading to serious danger to human health or the environment, immediate or delayed, inside or outside the establishment, and involving one or more dangerous substances.
Major Hazard	<p>Note: also refers to any applicable regulatory definition.</p> <p>A Hazard with the potential to result in:</p> <ul style="list-style-type: none"> • Multiple fatalities or permanent total disabilities. • Extensive damage to structure at installation or plant. • Massive effect to the environment (persistent and severe environmental damage that may lead to loss of commercial, recreational use, or loss of natural resources over a wide area.) (Alternatively: severe environmental damage that will require extensive measure to restore beneficial uses of the environment.) <p>Other Related Terms and Definitions:</p> <p>IADC HSE Case Guidelines Issue 02 – Hazards with potential to cause multiple fatalities, fire/explosion etc.</p>
Management Review	The formal evaluation of a company’s management system.
Management System	A structured set of interdependent doctrines, processes, documents, and principles that are intended to ensure that the activities of an organization are directed, planned, conducted, and controlled in such a way to provide reasonable assurance that the objectives of the organization are met.
Mitigation	<p>Limitation of the undesirable effects of a particular event.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO-17776 – Limitation of the undesirable effects of a particular event • IADC HSE Case Guidelines Issue 02 – Means taken to minimize the consequences of a incident that has occurred.
MODU HSE Case	A formal demonstration that the Health Safety Environmental risks associated with the MODU have been assessed and are being effectively managed.
Monitoring	<p>The repetitive and continued observation, measurement and evaluation of specific quality or performance criteria, to follow changes over a period of time and for a defined purpose.</p> <p>This term is sometimes further qualified to identify its specific purpose such as in Environmental Monitoring, Health Monitoring, etc. The monitored criteria are compared with the Screening Criteria to appraise compliance with regulatory standards and how well the operation is meeting company objectives.</p>

Term	Definition
Muster	Process of accounting for all personnel, in a drill, simulated emergency or real emergency.
Muster Point	A place of assembly for accounting all personnel assigned to that point.
Muster Time	The elapsed time for personnel to assemble at their designated Muster Station and complete checks, from first call to full muster check.
Non-Hazardous Area	Any area not classified as Zone 0, 1 or 2 and deemed to be non-hazardous with respect to the absence of any possibility of occurrence of a flammable atmosphere.
OHSEMS	A formalized OHSE management system that aims to identify and prevent hazards, while managing risks related to rig operations.
Operation	<i>(See also Hazardous Operation)</i> A set of physical activities and tasks within a process to achieve a desired result. E.g., running casing, rig move, etc.
Organization	An organization body or establishment, for example, a business or Company with more than one site, each site may be defined as an organization.
Other Workplace Hazard	 <p>NOTE: Also refers to any applicable regulatory definition.</p> <p>A Hazard with the potential to result in:</p> <ul style="list-style-type: none"> • Injury or ill health, up to and including single fatalities. • Significant damage to structure or equipment at installation or plant. • Limited environmental damage that will persist or require remedial action. <p>Other Workplace Hazard incorporates all hazards that are not Major Hazards (see definition of Major Hazards).</p> <p>Other Related Terms and Definitions:</p> <p>IADC HSE Case Guidelines Issue 02 – those that have potential to cause serious injury or ill health, including single fatalities. Within the Guidelines these hazards are referred to as Other Workplace Hazards and include Area and Task Hazards.</p>
Performance Standard	Describes the essential requirements which can be expressed in quantitative or qualitative terms, of the performance required of a system, item or equipment, or procedure that should be maintained throughout its working life. Some companies also refer to Performance Standards as goals or targets.
Personal Protective Equipment	Equipment intended to be held or worn by the worker to obtain protection from hazards.
Potential Loss of Life (PLL)	Expected number of statistical fatalities per year.
Pollution	Pollution is the introduction into the environment of substances or effects that are potentially harmful or interfere with man's use of his environment or interfere with species or habitats.
Qualitative Risk	Used where the determination of both consequences and likelihood of assessment event occurrence is largely based on the judgement of qualified and competent personnel, based on their experience.

Term	Definition
Quantitative Risk Assessment (QRA)	<p>The evaluation of the extent of risk arising, with incorporation of calculations based upon the frequency and magnitude of hazardous events.</p> <p>Also, Quantitative risk assessment involves the assignment of data-supported numeric values in the assessment of probability and consequence. It commonly follows an initial qualitative assessment, focusing on the highest-priority risks identified. Quantitative risk assessment can account for the simple operations where the level of risk is dependent on fewer variables and where uncertainties are relatively low. Quantitative assessments, however, can offer additional insight when the operation or technology is more complex; decisions regarding the effectiveness of risk controls and potential consequences are dependent on many variables; multiple paths to failure exist; the magnitude of risk is greater; or uncertainties are higher. Ultimately, choosing the appropriate risk assessment method is also for proper communication of risk between the operator, the regulator, and other interested parties. Qualitative Assessment</p> <p>Qualitative assessments are commonly used in oil and gas risk management and are valuable first steps in the risk analysis process. They add rigor and structure to the common risk assessment method of brainstorming.</p>
Risk	<p>Combination of the probability of occurrence of a consequence and the severity of that consequence.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO Guide 73 – Combination of the probability of an event and its consequences. • ISO-17776 – Combination of probability of an event and the consequences of the event • IADC HSE Case Guidelines Issue 02 – Means the likelihood that a specified undesired event will occur due to the realization of a hazard by, or during, activities, or by the products and services created by activities. The combination of the frequency, or probability, and the consequence of a specified hazardous event.
Risk Acceptance	<p>Decision to accept risk in a given context based on the current values of society.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO Guide 73 – Decision to accept a risk • ISO-17776 – Risk which is accepted in a given context based on the current values of society
Risk Analysis	<p>Systematic uses of information to identify hazards and to estimate risk.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO Guide 73 – Systematic uses of information to identify source and to estimate risk • ISO-17776 – Use of available information to identify hazards and to estimate risk

Term	Definition
Risk Assessment	<p>Overall process of risk analysis and risk evaluation.</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO Guide 73 – Overall process of risk analysis and risk evaluation • ISO-17776 – Overall process of risk analysis and risk evaluation
Risk Avoidance	<p>Decision not to become involved in, or action to withdraw from, a risk situation.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Decision not to become involved in, or action to withdraw from, a risk situation</p>
Risk Communication	<p>Exchange or sharing of information about risk between the decision-maker and other interested parties.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Exchange or sharing of information about risk between the decision-maker and other interested parties</p>
Risk Evaluation	<p>Process of comparing the estimated risk against given risk criteria to determine the significance of the risk.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Process of comparing the estimated risk against given risk criteria to determine the significance of the risk</p>
Risk Management	<p>Coordinated activities to direct and control an organization with regard to risk.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Coordinated activities to direct and control an organization with regard to risk</p>
Risk Matrix	<p>A tool for ranking and displaying risks by defining ranges for consequence and likelihood.</p>
Risk Optimization	<p>Process, related to a risk, to minimize the negative and to maximize the positive consequences and their respective probabilities.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Process, related to a risk, to minimize the negative and to maximize the positive consequences and their respective probabilities</p>
Risk Retention	<p>Acceptance of the burden of loss, or benefit of gain, from a particular risk.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Acceptance of the burden of loss, or benefit of gain, from a particular risk</p>
Risk Transfer	<p>Sharing with another party the burden of loss or benefit of gain, for a risk.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Sharing with another party the burden of loss or benefit of gain, for a risk</p>
Risk Treatment	<p>The process of selection and implementation of measures to modify risk.</p>
Safety Committee	<p>A committee of management and staff representatives with the remit to advise on and assess the adequacy of preventive measures affecting health, safety, and environment.</p>

Term	Definition
Safety Critical Element (SCE)	Such Parts of an Installation, including computer programs, or any part thereof: The failure of which could cause or contribute substantially to or a purpose of which is to prevent or limit the effect of a major accident.
Screening Criteria	<p>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 both in quantitative and qualitative terms.</p> <p>Screening Criteria includes (but is not limited to): regulatory requirements, industry standards, client requirements, internal company requirements (based on company values and experience).</p> <p>Other Related Terms and Definitions:</p> <ul style="list-style-type: none"> • ISO-17776 – Target or standard used to judge the tolerability of an identified hazard or effect • IADC HSE Case Guidelines Issue 02 – (Acceptance Criteria) – The limits within which risks are acceptable.
SHIDAC	<p>Structured Hazard Identification, Assessment, and Control (SHIDAC) Process incorporating the basics of fault-tree and event-tree, implementing measures to control hazards and to recover in case of barrier failure.</p> <p>A key deliverable is the identification or determination of Critical Activities or Tasks that ensure the identified Barriers are established, maintained, and effective.</p> <p>The steps are:</p> <ol style="list-style-type: none"> 1. Identify the hazards 2. Assess the potential consequences, their likelihoods and their associated risks 3. Identify hazard Control Barriers to prevent release 4. Identify Defense Barriers to protect people, assets, environment, and reputation in the event of such a hazard release.
Serious Incident or Fatality (SIF)	A life-threatening, life-altering, or fatal incident
Simultaneous Operations (SIMOPS)	Two or more different activities that are occurring close enough to each other that there is a risk of interference, clashing, or risk transfer.
Source	<p>Reason for the presence of a cause or defeating factor, or for the presence of the hazard itself. Sources can be operations (e.g., running casing), necessary equipment (e.g., pressure vessel, energized electrical panel, etc.), necessary materials (e.g. hazardous chemicals), etc.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Item or activity having a potential for a consequence (in the context of safety, source is a hazard).</p>
Source Identification	<p>Process to find, list and characterize sources.</p> <p>Other Related Terms and Definitions:</p> <p>ISO Guide 73 – Process to find, list and characterize sources</p>

Term	Definition
Stakeholder	Anyone with an interest or investment in a project, organization, or outcome, such as employees, customers, investors, or regulators. Also known as an interested party.
Summary of Operation Boundaries (SOOB)	<p>A summary of defeating factors (either single or in combination) that have the potential to exceed the tolerability limits of safe operations. These defeating factors are qualitatively determined using experience and establish the boundaries in which operations are carried out.</p> <p>Other Related Terms and Definitions:</p> <p>Shell EP95-0010 (Revision 1 – 25 Jan 2001) – (Manual of Permitted Operations – MOPO) – Manual of Permitted Operations defines the limits of safe operation when barrier effectiveness is reduced. The limit of safe operation permitted during periods of escalated risk in either likelihood or consequence. The limit of safe operations if the barriers are reduced, removed, or purposely defeated.</p>
Survey	An examination of a piece of equipment or a vessel in accordance with the appropriate Classification Society rules, guides, standards or other criteria of the Classification Society / Certifying Authority or in accordance with other specific standards. The examination may be required under classification or certification, or requested as a result of damage sustained by the piece of equipment or vessel.
Temporary Refuge (TR)	The facilities provided for monitoring and control of the incident and protecting personnel prior to evacuation.
Tolerability	Tolerability refers to the willingness to operate with a risk to secure certain benefits and in the confidence that it is being properly controlled.
Tolerability Criteria	Screening Criteria which express the level of health, safety, and/or environmental performance deemed tolerable for a given period of phase of activities. This may be defined both in quantitative and qualitative terms.
Top Event	<p>The release of a hazard is the first undesired event. This event is called the Top Event (the first Hazardous Event.) The Top Event is at the end of the fault tree and at the beginning of an event tree.</p> <p>Other Related Terms and Definitions:</p> <p>ISO-17776 – Particular hazardous event considered in the development of fault and event trees</p>
Verification	Represents the activities in addition to Assurance carried out by Independent Competent Person appointed by Duty Holder to confirm whether the SCE's will be, are and remain suitable.
Verification Scheme	A written scheme of examination for ensuring that identified HSE-critical activities / tasks and equipment / systems are suitable and remain in good repair and condition.
Workplace	The whole area of an installation, including accommodation, to which workers have access in the context of their work (i.e., all areas on the MODU).
Working Environment	The surroundings and conditions in which work is performed.

Term	Definition
Waste	<ul style="list-style-type: none">• Any substance which constitutes a scrap material or an effluent or any other unwanted surplus substance arising from the application of any process.• Any substance or article which requires to be disposed of as being broken, worn out, contaminated, or otherwise spoiled.
Work Equipment	Work equipment includes all machinery, apparatus, tools, or plant used in the course of work.

B.3 References

- ISO Guide 73 - Risk management - Vocabulary - Guidelines for use in standards (First edition 2002)
- ISO Guide 51 - Safety aspects - Guidelines for their inclusion in standards (Second edition 1999)
- ISO 45001:2018 Occupational Health and Safety Management Standard replaced OHSAS 18001:2007 in 2018
- ISO 14001:2015 Environmental Management Standard
- ISO International Standard 17776 - Petroleum and natural gas industries - Offshore production installations - Guidelines on tools and techniques for hazard identification and risk assessment (First edition, 2000-10-15)
- IADC Lexicon, IOGP Report No. 6.36/210, Guidelines for the Development and Application of Health, Safety and Environmental Management Systems (International Association of Oil & Gas Producers, July 1994).
- IADC North West European Health, Safety & Environment Case Guidelines for Mobile Offshore Drilling Unit (Issue 2, 30th June 2004)
- IADC Report No. 107-12-R-1 - Guidelines for Preparing a MODU Verification Scheme (Issue: 1, 16 December 1996)
- OGP Risk Management Guideline Task Force - Risk Management within the E&P industry - Key Concepts and Terminology
- UK HSE Safety Case Regulations

Appendix C: Drawings and Schematics

Drawing and Schematics	
<p>This list has been developed only as a guide to the drawings that should be included in the HSE Case. It is recommended that Drilling Contractors consult the relevant national authority and where appropriate, national regulations, to ensure that the HSE Case contains the required documentation.</p> <p>One drawing may contain relevant information for more than one title on the list.</p>	
General Arrangements	
1.	General Arrangement / Layout Drawing for Location
2.	General Arrangement Drawing of Standard Rig Components
Structural Integrity	
3.	Mast Design, Capabilities, Capacities / Operational Limitations
4.	Load Plan
Drilling and Well Control	
5.	Mud Process Schematic
6.	Choke and Kill Isometric
7.	BOP – Stack Layout
Power Generation and Distribution	
8.	Main Power Single Line Diagram with Switchboard layout
9.	Emergency Power Single Line
Fire and Explosion	
10.	Hazardous Areas
11.	Fire Control Plan
Evacuation and Escape	
12.	Emergency Plan
Certification	
13.	Listing of all relevant and valid certificates for the Rig
14.	Independent Specialist inspection reports

Appendix D: National Regulatory Index

D.1 Introduction

This appendix contains information on:

- Contact details of the Regulatory Authorities in:
 - Austria
 - Denmark
 - Germany
 - Hungary
 - Italy
 - The Netherlands
 - Poland
 - UK
- Information regarding submission of HSE Cases (or equivalent) for each regime.
- Reference indexes of the primary legislation as of February 2022.
- Reference index to ISO 45001:2018
- European Union Directive 89/391 (see note below)
- European Union Directive 92/91 (see note below)

D.2 Important Note

Although every effort has been made to ensure the accuracy and completeness of the information in this Appendix, it reflects only the knowledge available on the date of issue.

This Appendix may be updated on a more regular basis than the remainder of the guideline to accommodate legislative changes. However, Drilling Contractors are urged to verify the completeness of relevant legislative references with their respective National authorities prior to developing their HSE Case documents. They should also familiarize themselves with regional and local industry agreements, codes of practice, covenants, standards, and treaties applicable to their operations.

This Appendix also contains details of country-specific requirements not addressed within Parts 1 to 6 of this European Land version of the IADC HSE Case Guideline. When developing an HSE Case for use in Europe, where additional National requirements exist, Drilling Contractors should ensure that these requirements are incorporated within the body of their HSE Case.

Country-specific requirements, where identified, can be found after the foreword for each of the above Nations.

D.3 European Union Directives

For completeness, this Appendix also details two historical European Union Directives, but in view of the following statement from the European Union, it does not cross- reference individual articles with the main body of these guidelines. As National legislation takes precedence over EU Directives for industry, only they are cross- referenced.

“A Directive is adopted by the European Council in conjunction with the European Parliament or by the Commission alone. A directive is addressed to the Member States, not companies, organizations, or industries. Its main purpose is to align national legislation. A directive is binding on the Member States as to the result to be achieved but leaves them the choice of the form and method they adopt to realize the Community objectives within the framework of their internal legal order.” (EUR-Lex)

D.4 Relevant Regulations by Nation

D.4.1 Austria

Austria	
Regulator	Bundesministerium für Wirtschaft und Arbeit (Federal Ministry of Economics and Labour)
Location	Denisgasse 31 A-1200 Vienna Austria
Telephone	+43 (1) 711 00 3000
Fax	+43 (1) 714 3583
Email	post@IVSL.bmwa.gv.at
Website	https://www.onlinesicherheit.gv.at/Services/Behoerden-und-Institutionen/Uebersicht-Behoerden-Institutionen/BMAW.html

Austrian Legislation	
Legislation	Description
The Borehole Mining Act ("Bohrlochbergbau-Verordnung", Federal Law Gazette II 367/2005)	<ul style="list-style-type: none"> Covers regulations for borehole operations related to oil and gas activities Includes safety measures for: <ul style="list-style-type: none"> Minimum safety distances Prevention of explosions, fires, and blowouts Protection from irrespirable media Applies to exploration, production, storage, and pipeline transportation Ensures health and safety of all persons (except employees) and environmental protection
The Drilling Act ("Bohrarbeitenverordnung", Federal Law Gazette II 140/2005)	<ul style="list-style-type: none"> Standardizes occupational health and safety for employees during borehole operations Based on the Health and Safety at Work Act Incorporates Council Directive 92/91 EEC into Austrian legislation
The Explosive Atmosphere Act ("Verordnung explosionsfähige Atmosphären", Federal Law Gazette II 309/2004)	<ul style="list-style-type: none"> Regulates safety in environments with explosive atmospheres
Refer to the RIS Legal Information System at www.ris.bka.gv.at for more information.	

D.4.2 Belgium

Belgium	
Regulator	Federal Public Service Employment, Labor and Social Dialogue
Location	AD Humanization of Labor Rue E. Blerot 1 B-1070 Brussels Belgium
Telephone	+32 (0) 2 233 42 07
Fax	+32 (0) 2 233 46 39
Email	hua@work.belgium.be

Belgium Legislation
Belgian National Strategy Description
<p>Objective 1: Promote Safe and Healthy Work</p> <ul style="list-style-type: none"> • Prevent workplace accidents by updating regulations on fire prevention, construction sites, and serious accidents. • Address occupational exposure to hazardous substances like carcinogens, mutagens, and nanomaterials. • Update asbestos legislation and set binding exposure limits for chemical agents. <p>Objective 2: Strengthen Participation in the Labor Market</p> <ul style="list-style-type: none"> • Ensure foreign employees understand safety instructions through language support. • Provide proper training for young workers on workplace well-being. • Adapt working conditions for older employees to sustain their health. • Develop reintegration processes for employees with disabilities. <p>Objective 3: Strengthen Prevention</p> <ul style="list-style-type: none"> • Emphasize employer responsibility for prevention policies, especially in SMEs. • Enhance resources like OiRA tools and provide training for prevention advisors. • Clarify roles of internal and external prevention services. • Optimize inspection services and improve accessibility to occupational risk data. • Support social dialogue to bolster well-being policies. <p>Objective 4: Strengthen the Prevention Culture</p> <ul style="list-style-type: none"> • Foster a behavioral change to integrate prevention into all aspects of work. • Embed workplace well-being across government operations and public procurement. • Ensure government compliance with welfare legislation. <p>Refer to the Belgian Knowledge Centre at https://beswic.be/nl for more information.</p>

D.4.3 Bulgaria

Bulgaria	
Regulator	Federal Coordination Commission for Occupational Safety FCOS Secretariat
Location	Alpenquai 28 CH-6005 Lucerne
Telephone	041 419 59 59
Fax	
Email	

D.4.4 Denmark

Denmark		
Regulator	Arbejdstilsynet (Danish Working Environment Authority)	Energistyrelsen (Danish Energy Authority)
Location	Landskronagade 33 2100 Copenhagen Ø	Amaliegade 44 1256 København K
Telephone	(+45) 70 12 12 88. Press 9 for English	+45 33 92 67 00
Fax	+45 7012 1289	+45 33 11 47 43
Email	at@at.dk	ens@ens.dk
Website	https://at.dk/	https://ens.dk/

Denmark	
Bullying and Harrassment Hotline	(+45) 70 22 12 80
Hotline for foreign companies	(+45) 70 22 12 81
Telephone hours	Monday through Thursday: 8 am to 3 pm, Friday: 8 am to 2 pm
CVR number	21 48 18 15
EAN number	5798000394513

Danish Legislation	
Legislation	Description
Danish Working Environment Act	<ul style="list-style-type: none"> Supplemented by Executive Orders, which provide detailed, legally binding regulations with potential penal sanctions <p>Key Executive Orders under the Danish Working Environment Act</p> <ul style="list-style-type: none"> Regulations for specific equipment and environments: <ul style="list-style-type: none"> Lifts: Alteration and major repairs (Order 677) Centrifuges: Safety guidelines (Order 776) Hoists and Winches: Safe operation standards (Order 1101) Technical Work Equipment: Usage protocols (Order 1109) Trailers: Layout specifications (Order 775) Work environment and conditions: <ul style="list-style-type: none"> Building and Construction: Safety at worksites (Order 1516). Permanent Workplaces: Design and safety (Order 96). Alternating Workplaces: Guidelines for varied locations (Order 290). Psychosocial Environment: Mental health at work (Order 1406). Performance of Work: Procedures and standards (Order 1234). Chemical safety and hazardous materials: <ul style="list-style-type: none"> Carcinogenic Substances: Worker protection (Order 1795) Chemical Agents: Handling and safety (Order 1793) Manufacturers and Suppliers: Special duties for hazardous materials (Order 1794) Responsibilities and reporting: <ul style="list-style-type: none"> Clients and Supervisors: Duties in project management (Orders 117 and 110) Accident Reporting: Procedures (Order 1629) Professional Qualifications: Recognition of foreign qualifications (Order 151)
Refer to www.retsinformation.dk , for more information and for current laws (Danish only).	
Specific executive orders under the Offshore Safety Act are available at https://at.dk/en/regulations/working-environment-act/ .	

D.4.5 Estonia

Estonia	
Regulator	Ministry of Social Affairs
Location	Suur-Ameerika 1, 10122 Tallinn
Telephone	626 9301
Fax	699 2209
Email	info@sm.ee
Website	www.sm.ee
Legislation Website	www.riigiteataja.ee

D.4.6 France

France	
Regulator	National Agency for the Improvement of Working Conditions (Anact)
Location	192, avenue Thiers CS 800 31, 69457 Lyon cedex 06
Telephone	04 72 56 13 13
Fax	
Email	anact@anact.fr
Website	www.anact.fr

D.4.7 Germany

Germany	
Regulator	Landesamt für Bergbau, Energie und Geologie (LBEG) (State Authority for Mining, Energy and Geology)
Location	Stilleweg 2 30655 Hannover
Telephone	+49 (0)511-643-0
Fax	+49 (0)511-643-2304
Email	Central office for electronic incoming mail: poststelle-hannover@lbeg Niedersachsen.de Leitweg-ID: 03-0253000000-19
Website	https://www.lbeg.niedersachsen.de/
Additional Information	For press inquiries please contact: Phone: +49 (0)511-643-2274 presse@lbeg.niedersachsen.de

German Legislation	
LBEG State Office for Mining, Energy and Geology (LBEG) Description	
<ul style="list-style-type: none"> • Mission and Focus <ul style="list-style-type: none"> ○ Protects and promotes the sustainable use of natural raw materials and resources ○ Provides support to the state government, public administration, and Lower Saxony's economy on mining, energy, and geology matters • Organizational Role <ul style="list-style-type: none"> ○ Functions as a specialist authority under the Lower Saxony Ministry for Economics, Labor, and Transport • Collaborative Partnerships <ul style="list-style-type: none"> ○ Works with the Federal Institute for Geosciences and Natural Resources (BGR) ○ Partners with the Leibniz Institute for Applied Geophysics (LIAG) • Shared Resources <ul style="list-style-type: none"> ○ Collaborates through a joint administration and shared infrastructure at Geozentrum Hannover. 	
Refer to the LBEG State Office for Mining, Energy, and Geology at https://www.lbeg.niedersachsen.de/ for more information.	

D.4.8 Hungary

Hungary	
Regulator	Hungarian office of Mining and Geology
Location	1145 Budapest, Columbus u. 17-23
Mailing Address	1590 Budapest, Pf. 95
Telephone	+ 36-1-301-2900
Fax	+ 36-1-301-2903
Email	info@mbfsz.gov.hu
Website	www.mbfisz.gov.hu/en https://mbfisz.gov.hu/

D.4.9 Ireland

Ireland	
Regulator	Health and Safety Authority
Location	The Metropolitan Building James Joyce Street Dublin 1 D01 K0Y8
Telephone	+353 1 614 7000
Fax	
Email	contactus@hsa.ie
Website	https://www.hsa.ie/eng/Legislation/

D.4.10 Italy

Italy	
Regulator	Directorate-General for Infrastructure and Security (IS) National Mining Office for Hydrocarbons and Georesources (UNMIG)
Telephone	(+39) 06 4705 2531
Fax	(+39) 06 4705 2036
Email	dgisseg.dg@pec.mise.gov.it
Website	https://unmig.mise.gov.it

Italy	
Location	UNMIG Section of Northern Italy ex-DGISSEG Division VIII
Address	Via Zamboni, 1 - 40125 Bologna
Telephone	(+39) 051-234326
Fax	(+39) 051-228927
Email	unmig.bologna@pec.mise.gov.it

Italy	
Location	UNMIG Section of Central Italy ex-DGISSEG Division IX
Address	Viale Boston, 25 - 00144 Rome
Telephone	(+39) 06-5993-2750
Fax	(+39) 06-5993-2761
Email	unmig.roma@pec.mise.gov.it

Italy	
Location	UNMIG Section of Southern Italy ex-DGISSEG Division X
Address	Piazza Giovanni Bovio, 22 - 80133 Naples
Telephone	(+39) 081-5510049
Fax	(+39) 081-5519460
Email	unmig.napoli@pec.mise.gov.it

Italian Legislation
Safety and Health Document Submission Requirements and Acceptance Description
<p>Commission Overview</p> <ul style="list-style-type: none"> • The Commission for Hydrocarbons and Mineral Resources (CIRM) was established by Decree on May 14, 2007 (No. 78). • Serves as a technical advisory body to the Ministry of Economic Development • Formed by merging four pre-existing advisory bodies: <ul style="list-style-type: none"> ◦ Technical Committee for Hydrocarbons and Geothermal Energy ◦ Commission on Royalties ◦ Advisory Commission on Mining Safety ◦ Advisory Commission for Basic Mining Research <p>Sections of the Commission</p> <ul style="list-style-type: none"> • Section a): Provides opinions on technical investigations for mineral resource research and cultivation • Section b): Focuses on operational safety in mining activities • Section c): Handles determination and payment of royalties <p>Roles and Functions</p> <ul style="list-style-type: none"> • Plays a crucial role in administrative procedures in the mining sector • Provides mandatory technical opinions in some cases as per legislation • Contributes to resolving disputes and interpreting mineral resource regulations <p>Recent Updates</p> <ul style="list-style-type: none"> • Ministerial Decree of August 25, 2021, formally established Sections a) and b) of CIRM <p>Refer to the Ministry of Environment and Energy Security at https://unmig.mase.gov.it/ for more information.</p>

D.4.11 Latvia

Latvia	
Regulator	The State Labour Inspectorate (SLI) Republic of Latvia
Location	38 k-1, Kr.Valdemara Street Riga LV –1010
Telephone	+371 67021704 +371 24777997
Fax	
Email	vdi@vdi.gov.lv
Website	www.vdi.gov.lv

D.4.12 Lithuania

Lithuania	
Regulator	Ministry of Social Security & Labour
Location	Budgetary institution A. Vivulskio str. 11 03610 Vilnius
Telephone	(8 5) 266 4201
Fax	(8 5) 266 4209
Email	post@socmin.lt
Website	www.socmin.lrv.lt/lt/teisine-informacija/teises-aktai www.socmin.lrv.lt

D.4.13 Luxembourg

Luxembourg	
Regulator	Ministry of Labour, Employment and the Social Solidarity Economy
Location	26, rue Sainte-Zithe L-2763 Luxembourg
Telephone	(+352) 247-86100
Fax	(+352) 247-86108
Email	
Website	www.mteess.gouvernement.lu

D.4.14 North Macedonia

North Macedonia	
Regulator	Ministria e Punës dhe Politikës Sociale
Location	Rr. Dame Gruev, nr. 14 1000 Shkup
Telephone	
Fax	
Email	mtsp@mtsp.gov.mk
Website	www.mtsp.gov.mk/plati.nspix

D.4.15 The Netherlands

The Netherlands	
Regulator	State Supervision of Mines (Staatstoezicht op de Mijnen)
Location	Henri Faasdreef 312 2492 JP The Hague
Mailing Address	PO Box 24037 2490 AA 's-Gravenhage
Telephone	
Fax	
Email	info@sodm.nl
Website	www.sodm.nl

Dutch Legislation	
Legislation	Description
Working Environment Act 2004 and Executive Order 559 (dated 17 June 2004)	<ul style="list-style-type: none"> State Supervision of Mines (SodM) is committed to human safety and the protection of the environment in energy production and the use of the subsurface, now and in the future. Coordination with the State Supervision of Mines <ul style="list-style-type: none"> Contractors should consult the State Supervision of Mines before developing their HSE Case to ensure compliance. Guidance Limitation <ul style="list-style-type: none"> This requirement is not covered within Parts 1 to 6 of the global IADC HSE Case Guideline. Drilling contractors must address and incorporate an additional requirement specific to The Netherlands in their HSE Case documentation.
Refer to the SodM at www.sodm.nl for more information.	

D.4.16 Norway

Norway	
Regulator	Det nasjonale forskningsinstituttet innen arbeidsmiljø og arbeidshelse (STAMI)
Location	Gydas vei 8, 0363 Oslo, Norway For deliveries (by parcel services and others) please use our location address.
Mailing Address	Pb 5330 Majorstuen, 0304 Oslo, Norway
Telephone	
Fax	
Email	postmottak@stami.no
Website	www.stami.no

D.4.17 Poland

Poland	
Regulator	Wyższy Urząd Górniczy (State Mining Authority)
Location	ul. Poniałowskiego 31 40-055 KATOWICE
Telephone	+48 32 736 17 00
Fax	+48 32 251 48 84 +48 32 736 18 29
Email	wug@wug.gov.pl
Website	www.wug.gov.pl

Polish Legislation	
Legislation	Description
Mining Safety Commission	<ul style="list-style-type: none"> Provides opinions, applications, and proposals to the President of the State Mining Authority on work safety in mining Includes representatives from employers, trade unions, universities, research units, and the Association of Mining Engineers and Technicians Covers all types of mining including underground, open-pit, and borehole The main goal is continuous improvement in work safety and the elimination of risks in mining operations. Key areas include: <ul style="list-style-type: none"> Occupational health and safety. Application of regulations under Art. 120 sec. 1, Art. 120 sec. 2, and Art. 124 of the Geological and Mining Law. Other issues related to mining work safety as identified by the President of the State Mining Authority. The impact includes: <ul style="list-style-type: none"> Commission resolutions and conclusions lead to actions by mining supervision authorities. Can serve as a basis for communication from the President of the State Mining Authority to research units, entrepreneurs, and government bodies. Facilitates social dialogue and discussions on mining safety issues among interested parties.
Art. 120 sec. 1	<ul style="list-style-type: none"> Underground mining plant requirements (Regulation of the Minister of Energy, 2016). Opencast mining operation requirements (Ordinance of the Minister of Economy, 2013). Borehole mining plant requirements (Regulation of the Minister of Economy, 2014).
Art. 120 sec. 2	<ul style="list-style-type: none"> Blasting agents and equipment storage/use requirements (Regulation of the Minister of Energy, 2016)
Art. 124	<ul style="list-style-type: none"> Mine rescue requirements (Regulation of the Minister of Energy, 2017)
Refer to the State Mining Authority at www.wug.gov.pl for more information.	

D.4.18 Portugal

Portugal	
Regulator	Autoridade Para as Condições do Trabalho
Location	
Telephone	
Fax	
Email	
Website	https://www.act.gov.au/

D.4.19 Romania

Portugal	
Regulator	INCDPM
Location	35 A, Ghencea Blv, Sector 6, Postal code: 061 692, Bucharest (across the “Ghencea Militar” cemetery)
Telephone	Secretariate: +40 (021) 313 31 58; Phone exchange: +40 (021) 313 17 26-29
Fax	+40 (021) 315 78 22
Email	office@inpm.ro
Website	https://www.incdpm.ro/

D.4.20 Serbia

Serbia	
Regulator	Ministry of Labor, employment, veterans and social affairs
Location	
Telephone	Social protection: 011 / 303-86-61 Persons with disabilities and veteran disability protection: 011 / 303-86-77 Labor and labor inspection: 011 / 303-86-77 Pension and Disability Insurance: 011 / 334-78-09 Person in charge of personal data protection – 011 / 363-15-41 Press service: 011 / 361-36-48; press@minrzs.gov.rs Protocol: 011 / 264-22-75; protocol@minrzs.gov.rs
Fax	
Email	
Website	www.minrzs.gov.rs/sr

D.4.21 United Kingdom

United Kingdom	
Regulator	Offshore Safety Division Health & Safety Executive
Location	Lord Cullen House Fraser Place Aberdeen AB25 3UB United Kingdom
Telephone	+44-1224-252500
Fax	
Email	hse.infoline@natbrit.com
Website	www.hse.gov.uk

United Kingdom Legislation	
Legislation	Description
Extractive Industries Directive 92/91	<ul style="list-style-type: none"> Implemented in the UK by the Borehole Sites and Operations Regulations 1995 (BSOR) Includes a requirement for well operation notification (regulation 6) to align land operations with offshore regulations The Health and Safety document must be: <ul style="list-style-type: none"> Be prepared before work begins on site. Be kept up to date and revised if there are major changes to the borehole site, including natural changes, extensions, or conversions. Be kept on-site at the rig and made available to HSE inspectors in case of an accident or incident. Show the required safety demonstrations in addition to the details outlined in the regulations. Demonstrate that the rig owner's management system ensures legal compliance and effective management of contractors and subcontractors. Show that there are adequate arrangements for audits and reporting. Show that an effective system is in place to ensure compliance with health and safety laws. Show that hazards with the potential for major accidents are identified and that risks are controlled. The Health and Safety document is not required to be submitted to the HSE or approved.
Refer to the Health and Safety Executive at https://www.hse.gov.uk/ for more information.	

Appendix E: ISO 45001:2018 – Occupational Health and Safety Management System Specification

Standard: Globally recognised Specification

Application: Compliance with this Occupational Health and Safety Assessment Series publication does not of itself confer immunity from legal obligations.

The ISO 45001:2018 summary is available at <https://www.iso.org/standard/63787.html>.

E.1 ISO Summary

As of 2025, the ISO 45001 can be summarized by the following:

“ISO 45001:2018 specifies requirements for an occupational health and safety (OH&S) management system, and gives guidance for its use, to enable organizations to provide safe and healthy workplaces by preventing work-related injury and ill health, as well as by proactively improving its OH&S performance.

ISO 45001:2018 is applicable to any organization that wishes to establish, implement and maintain an OH&S management system to improve occupational health and safety, eliminate hazards and minimize OH&S risks (including system deficiencies), take advantage of OH&S opportunities, and address OH&S management system nonconformities associated with its activities.

ISO 45001:2018 helps an organization to achieve the intended outcomes of its OH&S management system. Consistent with the organization's OH&S policy, the intended outcomes of an OH&S management system include:

- a. continual improvement of OH&S performance;*
- b. fulfilment of legal requirements and other requirements;*
- c. achievement of OH&S objectives.*

ISO 45001:2018 is applicable to any organization regardless of its size, type and activities. It is applicable to the OH&S risks under the organization's control, taking into account factors such as the context in which the organization operates and the needs and expectations of its workers and other interested parties.

ISO 45001:2018 does not state specific criteria for OH&S performance, nor is it prescriptive about the design of an OH&S management system.

ISO 45001:2018 enables an organization, through its OH&S management system, to integrate other aspects of health and safety, such as worker wellness/wellbeing.

ISO 45001:2018 does not address issues such as product safety, property damage or environmental impacts, beyond the risks to workers and other relevant interested parties.

ISO 45001:2018 can be used in whole or in part to systematically improve occupational health and safety management. However, claims of conformity to this document are not acceptable unless all its requirements are incorporated into an organization's OH&S management system and fulfilled without exclusion.”

Appendix F: European Directives

The Directives listed are for historical reference only. Legislation detailed within sections A4.2 – The Netherlands; A4.3 – Denmark; A4.4 – United Kingdom; and A4.6 – Germany takes precedence over the articles listed below which have been incorporated into national legislation. It is that legislation that must be complied with, these articles are for European Member State use only.

European Directives				
Directive Number	Official Journal	Date	Pages	Description and Link
89/391/EEC	L 183	29/06/1989	0001 – 0008	Introduction of measures to encourage improvements in the safety and health of workers at work https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:31989L0391 .
92/91/EEC	L 348	28/11/1992	0009 – 0024	The minimum requirements for improving the safety and health protection of workers in the mineral-extracting industries through drilling (eleventh individual Directive within the meaning of Article 16 (1) of Directive 89/391/EEC) https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31992L0091

The following links provide the latest regulations.

Section	Country	Links
A4.2	The Netherlands	https://www.nlog.nl/en/legislation-0
A4.3	Denmark	https://ens.dk/
A4.4	United Kingdom	https://www.hse.gov.uk/
A4.6	Germany	https://www.gesetze-im-internet.de/englisch_bbergg/

Revision History

Document Review History		
Issue	Review Status	Date
A	First draft issue of the European Land Version	8 May 2007
B	Working Draft removing European limitation and incorporating comments received from all Stakeholders	12 June 2007
1.0	Formal Issue, incorporating comments from all Stakeholders, resulting in minor amendments to Parts 1, 2, 3, 4, 5, & 6	9 October 2007
1.0.1	Administrative update	27 July 2009
2.0	Fully updated	1 March 2022