International Association of Oil & Gas Producers

International Association of Geophysical Contractors

REPORT 432 | NOVEMBER 2017

Managing HSE in a Geophysical Contract

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Revision history

VERSION	DATE	TITLE	AMENDMENTS
4.0	November 2017	Report 432, *Managing HSE in a Geophysical Contract*	Complete document revision
		Also Report 432-01, *Management of subcontractors and temporary workforce in geophysical operations – Supplement to Report 432*	Version 2.0, October 2017. Previously published as *Guidance note on subcontractor management in geophysical operations*. Revised and expanded.
		Also Report 432-02, *Risk management in geophysical operations – Supplement to Report 432*	Version 1.0, October 2017. First issue.
3.0	December 2009	Report 432, *Managing HSE in a Geophysical Contract*	Complete document revision
		Also Report 432-01, *Guidance note on subcontractor management in geophysical operations*.	Version 1.0, October 2012. Supplement to version 3.0 of Report 432.
2.0	May 2001	Report 6.92/317, *HSE aspects in a contracting environment for geophysical operations – Schedules and plans*	Report 280 merged with updated schedules
1.0	September 1998	Report 6.71/280, *Guidelines for Documenting and Implementing Field HSE Management System for Geophysical Operations*	
	July 1995	Report 6.35/207, *HSE Schedules for Land Operations*	
	July 1994	Report 6.34/206, *HSE Schedules for Marine Geophysical Operations*	

Contents

1. Introduction

1.1 General

This guideline is a review and update of the previous version, *Managing HSE in a geophysical contract*, IOGP Report 432, issued in December 2009.

This document covers the occupational **health and safety, security, social responsibility and environmental** aspects of geophysical industry contracts. These disciplines will be collectively referred to throughout this report by the simpler historical acronym '**HSE**'. This nomenclature is consistent with Report IOGP 423 which defines the process for client and contractor working together in a contracting environment.

In the same vein, in the remainder of this guideline where appropriate, the historical acronym '**HSE-MS**' will be used (instead of OMS, as defined in Report IOGP 510) to signify that this report covers applicable HSE aspects of IOGP 510 (in Table 1), supported by specific HSE risks to the geophysical industry (in Table 2). Only Quality aspects of IOGP 510 are excluded in this guideline.

HSE	Health, Safety and Environment. In this report, HSE covers the expanded definition of health and safety, security, social responsibility and environment.
HSE-MS	Health, Safety and Environmental Management System

This guideline is consistent with and supplementary to:

- *Operating Management System Framework* (IOGP Report 510) and *OMS in practice* (IOGP Report 511), collectively referred in Appendix 3 as M1
- *HSE management – guidelines for working together in a contract environment* (IOGP Report 423), referred in Appendix 3 as M2.

This guideline addresses the HSE management systems currently recognized as good practice and commonly applied in geophysical operations. The guideline describes the structure for the project HSE documentation including a project HSE plan and bridging documentation between the involved parties. The above may be supported by a crew HSE plan. The crew HSE plan and the project HSE plan may be combined into a single document. For any project, the foregoing combined documentation fulfils the function of a safety case, which is a regulatory requirement in some jurisdictions.

Client, contractors and subcontractors have a duty of care, one to the other, to all personnel and to society at large to ensure that risks are effectively managed. The scope of work should be managed in a safe, healthy and environmentally sound manner whilst maintaining an efficient operation.

1.2 Purpose

The purpose of this document is to provide a framework in which best practices and standardization in geophysical operations HSE management are shared. This information has been gained through the collective experiences of IOGP and IAGC members.

This guideline is intended for all parties engaged in a contract for geophysical operations including client, contractors and subcontractors. The guideline is generic and intended for use by a global audience. It can provide a good reference for companies in the geophysical industry who may not be familiar with IOGP guidance for HSE management.

Specific guidance is provided on HSE plans for geophysical operations projects. Additionally, Tables 1 and 2 in Appendix 5 are designed for use and inclusion in contracts to facilitate industry standardization of contract HSE expectations. Use of this guidance in a contract should be agreed between the client and contractor.

1.3 Scope

The scope of this report is to provide information about the potential hazards and risks which may be encountered on geophysical operations projects. It is also about implementing the eight-phase process (defined in IOGP 423) for safely managing geophysical operations projects in a contract environment.

This report provides industry guidance and content which can be used for auditing management systems and land, marine and transition zone (TZ) geophysical operations, while also providing the foundations for contractual HSE expectations.

Geophysical operations can also include in-field processing, Controlled Source Electromagnetic acquisition (CSEM), passive Electro-Magnetic (EM), Magnetotellurics (MT), gravity and magnetic surveys (airborne, land and marine), Vertical Seismic Profiling (VSP), microseismic and site surveys. However, this document does not necessarily cover all the specific hazards associated with each technology.

1.4 Geophysical Contractor Management and the Fundamentals

Report 510 describes four Fundamentals. These are management principles that are the most influential success factors for an operating management system. They are:

- Leadership
- Risk management
- Continuous improvement
- Implementation.

1.4.1 Leadership

There are several key leadership actions that should be taken during the various Phases of the contracting process. Leaders from both the client and contractor organizations should:

- schedule the project to allow sufficient time to implement the HSE-MS and address the project constraints and risks effectively
- allocate the necessary resources to manage the project, and re-assess regularly
- communicate clearly the HSE-MS expectations and accountabilities, including any delegated responsibilities
  - from client to contractors
  - within the contractor organization and
  - to subcontractors
- attend pre-mobilization meetings to kick-off a contract
- be visible and accessible to the work force
- participate in site visits, and discuss issues that challenge the performance of risk controls and barriers
- recognize and reward positive behaviour, or intervene and address behaviour that does not meet expectations
- participate in contractor/supplier relationship meetings and discuss progress and performance in the delivery of the contractual scope of work.

1.4.2 Risk management

Risk management is a critical function when a client and contractor are working together in a contract environment. Different aspects of risk management permeate throughout all phases of the contracting life cycle. The geophysical industry has hazards, risks and opportunities that are inherent to its assets, activities and operational locations. The use of a standardized approach to risk management, as described in this report, has the advantage of accounting for the different sources and types of risk found in both client and contractor activities.

Before entering into a contract and starting any operation or project, it is important to establish the context and assess the risks. All potential consequences – beneficial and adverse – should be assessed in terms of hazards, effects, aspects or threats, and the probability and potential severity of a consequence used to assess the level of risk. There should also be a clear understanding of the technical objectives, scale of operations, geographic location and timeframe.

The risk profile of a project from the initial assessment of the proposed contractual scope of work will determine how an HSE-MS will be applied to control the identified risks. The risk assessment process should be repeated as the project progresses to reassess the identified risks, identify new risks and define or modify controls. Clients and contractors should both have robust risk management processes in place to ensure the risk profile is up to date.

Clients and contractors should also have assurance mechanisms in place. An assurance mechanism is an activity, process or action (such as an audit or verification activity) that provides confidence and confirmation that the HSE-MS (or any part of an HSE-MS) is achieving its purpose and meeting or exceeding expected performance. The type and degree to which these assurance mechanisms are implemented during each phase may vary depending on the HSE-MS that governs the work, the mode of contracting, the risks associated with the work and the risk tolerance of the individual client company.

More information on risk management can be found in the supplemental guidance document IOGP 432-02, *Risk management in geophysical operations*. The following risk matrix is customized and recommended for geophysical operations projects (Figure 1).

Company logo goes here	Probability Scale Levels	Probability A	B	C	D	E
	General	Very unlikely	Unlikely	Possible	Likely	Very Likely
	Historical	Never heard of in the industry operations	Has occurred in industry operations	Has occurred in geophysical operations or similar E&P operations	Happens about yearly in similar geophysical operations w orldw ide	Happens about monthly in similar geophysical operations w orldw ide
	Descriptive	A freak combination of factors w ould be required for an incident to result	A rare combination of factors w ould be required for an incident to result	Could happen w hen additional factors are present but otherw ise unlikely to occur	Not certain to happen but an additional factor may result in an accident	Almost inevitable that an incident w ould result

Consequences					Probability				
People	Environment	Assets	Reputation	Severity	A	B	C	D	E
No health effect/injury/ illness	No effect	No damage	No impact	0					
Slight health effect/injury/ ilness	Slight effect	Slight damage	Slight impact	1					
Minor health effect/injury/ ilness	Minor effect	Minor damage	Limited impact	2					
Major health effect/injury/ illness	Local effect	Local damage	Considerable impact	3					
Single fatality / permanent total disability	Major effect	Major damage	Major national impact	4					
Multiple fatalities	Massive effect	Extensive damage	Major international impact	5					

Risk classification and management response	
WHITE	Maintain existing risk control measures
YELLOW	Control at workplace level and manage for continuous improvement
ORANGE	Requires constant management attention and incorporation of risk reduction measures
RED	Very substantial risk reduction measures and seriously consider alternatives

Figure 1: Example of a qualitative Risk Assessment Matrix (RAM), based on Probability and Consequence for People, Environment, Asset and Reputation

1.4.3 Continuous Improvement

The Plan–Do–Check–Act (PDCA) cycle for continuous improvement should be used when designing assurance mechanisms for each phase. Verification, monitoring and audits as described in *Phase Six: Execution* provides the best opportunities to continuously improve safe and efficient contract delivery.

In addition, much of the guidance provided in *Phase Eight: Final Evaluation & Close-out* centres around performance review meetings, final reports, capturing lessons learned and sharing the lessons, which are key aspects of continuous improvement. IOGP Report 538, *Guidance for the use of the Geophysical Contractor Management Self-Assessment (GCMSA)*, is a continuous improvement tool available for geophysical contractors.

1.4.4 Implementation

Effective implementation of the defined scope of work, including meeting the client HSE requirements and the contractor's own standards are the ultimate goals of the contracted activity. This guide should be implemented by client and contractors so that individual risk controls are consistently applied, regardless of the contracted scope of work.

Policies, standards, processes and procedures including the HSE plan and associated documents are key to implementing the selected management system for the scope of work. These should be well communicated and consistently implemented across the client, contractor and subcontractor organizations.

Effective implementation requires a competent, disciplined and capable workforce, with a shared commitment to carry out the work safely, responsibly, reliably and in conformance with the plans and procedures developed during the initial phases of a project and in conformance with this guide. Responsibilities, accountabilities and authorities need to be maintained to effectively implement the requirements of the contract.

2. Geophysical implementation of IOGP 423 Project Phases

Geophysical Operations projects can be compartmentalized into eight phases as described in IOGP 423. Several tasks, undertaken in parallel within each phase, are conducted and delivered by various stakeholders. Stakeholders include the client, contractor and subcontractors as shown in Table A below.

Therefore, sufficient time should be allocated to each one of these phases, and a clear process established to ensure all tasks are completed and signed off before moving on to the next phase. A stage gate process may be established where an accountable manager is responsible to review and approve the project before moving to the next phase.

Minimum project planning time should be defined based upon the complexity of a particular geophysical operation. This is identified during the initial planning phase when a preliminary risk assessment is conducted.

Table A: Client, contractor and subcontractor activities and documentation associated with each geophysical project phase

Phase	Client	Contractor	Subcontractors
1. Planning	• Project specific scope of work, identify requirements and license terms • High level project Plan	• HSE-MS, policies, standards and operating procedures	
2. Capability Assessment	• Prequalification HSE-MS audits, request for information	• Provide client access for auditing	• Provide contractor access for auditing
3. Tender and Award	• Project preliminary risk assessment and hazard register • Pre-contract equipment audits • HSE tender evaluation	• Contractor preliminary risk assessment • Project proposal including HSE elements • Risk verification Plan • Contract award meeting	• Support contractor's tender response
4. Pre-mobilization	• Client-contractor bridging document • SIMOPS Plan • Monitoring Plan	• Project kick-off meeting, plus regular planning meetings • Joint HSE Risk assessment and risk register • Plans, e.g.: – Project HSE – Crew HSE (optional) – Emergency Response – Environmental management – Waste management – Security Management – Health Management – Social Responsibility – Contractor–subcontractor interface document	• Support and interface with contractor

Phase	Client	Contractor	Subcontractors
5. Mobilization	• Verification and acceptance of offered equipment, personnel and processes	• Mobilization Plan • Field start-up meeting • Risk management verifications (as applicable) • Closure of any high priority action items	• Participate in contractor HSE activities • Closure of any high priority action items
6. Execution	• Oversight Plan • Risk management verifications	• Implement • Pre-mobilization Plans • Self-verification activities • Regular project review meetings	• Deliver project HSE requirements in line with contractor expectations
7. De-mobilization	• Regulatory notifications	• De-mobilization Plan	• Participate in contractor HSE activities
8. Final Evaluation and Close-out	• Post project evaluation metrics reviewed with Contractor	• Project close-out meeting • Final project close-out report	• Participate in contractor HSE activities

2.1 Planning

The client should prepare a high-level plan to undertake the project. This should include the scope of work, all aspects of HSE management, licence requirements, local government requirements, its own corporate HSE policies, procedures, identified risks and controls, project specific aspects (e.g. SIMOPS, obstacles, conditions), other specific deliverables, any joint venture input, and the political, economic and security viability of undertaking the project.

It is important that the client has conducted an initial hazard identification (HAZID) and risk assessment. This is done to ensure that major HSE hazards that may impact the project have been captured in a hazard register and communicated via the tender documents. This will ensure that all potential contractors bidding on the work are fully informed regarding the known project hazards and client specific requirements.

Independent research by the contractor may also provide additional information that can be used to develop a better understanding of the full scope of the project. Contractor should inform client of any additional hazards and risk, along with proposed controls. There should be sufficient lead time to ensure that all parties involved (client, contractor and subcontractors) can fully discharge their responsibilities in terms of tender, bid and project preparation.

A list of client responsibilities is listed below, which may not be all inclusive or exhaustive. Clients should:

- obtain government licence to explore prospect
- identify and obtain where necessary all requirements of licences, labour laws, compensation requirements, taxation and prospect reclamation
- identify any support facilities in the prospect area that may be required in emergency situations
- gather data on the prospect and conduct scouting
- conduct HAZID and initial risk assessment
- gather relevant historical events associated with the prospect that may impact the project
- review historical health events/endemic health problems
- commission impact assessments, including environment, social, and health impacts
- identify known legal issues that may affect the work
- identify stakeholder interests and concerns
- identify potential contractors and subcontractors who may be invited to tender.

This initial information gathering is conducted prior to the Invitation to Tender (ITT). Once a contractor has been selected and the project moves through the phases, the data provides a baseline for the ongoing risk management of the project. As the project is developed with the contractor, a greater depth of detail should come from the collaborative efforts to ensure a complete understanding of all potential issues and risks, with the plans to address them.

Depending on the contracting mode and the contract award strategy that may not include an invitation to tender, the planning phase may overlap or seamlessly turn into the project's pre-mobilization phase. At this stage, it is imperative that client, contractor and relevant subcontractors carry out a joint pre-project risk assessment, which will include the initial HAZID and risk assessment, the contractor's operational risk assessment and the subcontractors risk assessments for their equipment and processes. The impacts of the operational interrelationships should be explored.

2.2 Capability assessment

IOGP Report 423 is the controlling document on recommended methodology for general contracting and subcontracting. The following is quoted in abbreviated form from it.

One of the most important contract management decisions to be made by the client is to specify the mode in which the contractor, or alliance of contractors, is held responsible for the management of HSE. Three distinctly different modes are described below.

Mode 1

The contractor provides people, processes, and tools for the execution of the contract under the supervision, instructions and HSE-MS of the client. The contractor has an HSE management system to provide assurance that the personnel for whom they are responsible are qualified and fit for work and that the processes, tools, materials and equipment they provide are properly maintained and suitable for the contract.

Mode 2

The contractor executes all aspects of the contract under its own HSE-MS, providing the necessary instructions and supervision and verifying the proper functioning of its HSE-MS. The client is responsible for verifying the overall effectiveness of the HSE management controls put in place by the contractor, including its interface with subcontractors, and assuring that both the client's and the contractor's HSE-MS are compatible.

Mode 3

Contractor operates within its own HSE-MS that has no interface with client HSE-MS and is not required to report HSE performance data including incidents to the client. However, this does not exclude the possibility that the client may wish to guide and influence HSE performance under this type of contract.

Selection of one only of these modes is preferred and should be in alignment with local and national legislative requirements. However, in certain situations it may be necessary to adopt a mixture of Mode 1 and Mode 2. Examples of such situations are given below:

- Operations in an area where there is a limited selection of contractors able to meet the evaluation criteria. For example, an alliance may have to be formed between the client and available contractors with the objective to develop, implement and/or improve an HSE-MS for the contractor while executing work under the HSE-MS of the client. The contract will initially operate under Mode 1.

- The work is intimately associated with the activities of the client, or presents such a high risk to the client that the work is to be executed using the client's HSE-MS under Mode 1.
- Operations too large or diverse for a single contractor may require a number of contractors and subcontractors (a consortium) to work together under the supervision of one main contractor working for the client under Mode 2.
- The contractor executes most aspects of the contract under its own HSE-MS, Mode 2; however, certain support activities such as transportation and emergency response are provided by the client.

When working with more than one contractor, it is preferable to identify a lead contractor.

Where a lead contractor cannot be assigned, the client should retain responsibility. Other than a Mode 3 situation, the client always has the ultimate accountability for the project.

Client and/or contractor should have a defined process in place for selecting their contractor/subcontractors, such as:

- Mode 1: inspect/assess and state requirements
- Mode 2: HSE capability assessment to consist of questionnaire (see IOGP 423) and inspection under operational conditions (mutual agreement is required to allow such inspection)
- Mode 3: HSE capability assessment based upon potential HSE implications to the client (see IOGP 423 questions regarding liability, insurance, reputation, business continuity, directing activity and client control). Define specification, inspection and quality control of the products required.

Note that some Mode 3 contracts, where the client is actively engaged to guide and influence HSE critical activities, e.g. medical service providers, hospitals, off site food/catering providers, hotels, airlines and aviation fuel providers, may require additional discussions and agreements with the contractor. These situations should require specific attention in the form of more elaborate inspection of their facilities and capabilities as well as more permanent monitoring of their performance.

Contracting with (shared) construction yards or shipyards is not considered in the scope of this guideline, as in these cases the client will not normally be involved.

A particular type of contract used in the geophysical industry is the non-proprietary survey (or speculative survey) licensing process. An independent contractor typically acquires the geophysical data and retains data ownership, but sells user licenses to E&P clients.

In most cases this should be considered a Mode 3 contract relationship. However, the arrangement should not be abused to avoid Mode 2 responsibilities for a client. Case by case assessment will need to be made. This can range from undisputed Mode 3, e.g. purchasing a license agreement for data acquired in the past ('product purchase'), to possible Mode 2, if a major part of the non-proprietary survey would be in acreage held by the client (and hence its reputation and stewardship for the acreage may be affected).

Client companies will have their own system for selecting contractors. They may have a pre-selection system or they may use an open tender system. The objective is to ensure that the contractor who is chosen is competent, financially viable and will carry out the project in a safe and environmentally acceptable manner. Similarly, contractors will have a system in place to select subcontractors who will provide services or supplies in compliance with best industry practice to ensure subcontractors do not compromise good HSE practices.

In some circumstances, the client may engage subcontractors for the project. Where this occurs, it is important that client and contractor have good agreement on the terms by which subcontractors are engaged and how these subcontractors will be managed during operations. The interface process should clarify these terms.

The client should make its selection of contractor from the results of the tenders, considering the HSE management potential of the identified contractual arrangements.

The chosen contractor will select its subcontractors that will be engaged in the project (labour contractor, shot hole drilling, aircraft rental, bulldozing, on site catering, etc.). This is usually done by issuing an invitation to tender (ITT) containing an abbreviated version of Tables 1 and 2 specific to the service that the subcontractor will provide. In the case of marine seismic, the seismic contractor may either subcontract the vessels (seismic, support, chase) or they may own them.

Subcontractors that provide supplies or external services (fuel provision, food supplies, accommodation, outside equipment repairs, dock/port facilities, etc.) should be selected after assessment of the hazards that may be introduced by them and the level of associated risk.

Where a subcontractor does not have a recognized HSE-MS compliant with industry guidelines, it may be necessary for the subcontracted work to be conducted under the contractor HSE-MS (see Mode 1 above).

Subcontractor selection may be subject to client approval.

Reference is made to supplemental report IOGP 432-01, *Management of subcontractors and temporary workforce in geophysical operations.*

2.3 Tender and award

The client issues an ITT to its selected contractors for them to submit a tender. The ITT must identify the major HSE hazards that have been identified by the client during the planning stage. This will enable the contractors to submit a tender that should provide a crew that can fulfil the client requirements efficiently and operate with an expectation of zero HSE incidents. During the ITT process, questions from the various contractors should be shared anonymously with the other vendors so that both technical and HSE information is the same for all vendors. This will help to assure that all tenderers prepare bids utilizing the same information. It should also highlight additional HSE potential risks that the client may not have been aware of when putting the tender together. This will help to build a more complete risk profile of the project. Specific local requirements should also be part of the ITT process so that vendors are able to take those into consideration in their bid. Contractors should propose competent personnel, subcontractors, and equipment that is fit for purpose against the ITT requirements.

Tables 1 and 2 should be used by both client and contractor to identify the HSE aspects required for the project.

Table 1 sets out the expectations of the elements for an HSE-MS.

Table 2 sets out the minimum expectations for the control of specific risk areas.

In both tables, column 2 sets out the minimum expected controls; column 3 provides a place for client and contractor to offer alternatives or exceptions; column 4 gives specific reference to accepted industry guidelines.

During negotiations, column 3 may be used to record agreed variations. No other column should be edited. This provides the potential to reference this report as the contractual basis for HSE management. Only exceptions or variations introduced to column 3 then need to be listed.

The contractor should decide whether it will need to engage any subcontractors for certain aspects of the operation and ensure that all relevant client requirements contained or implied in the ITT are fully passed on to any subcontractors who are engaged for the project.

The award of a contract represents the acceptance, by all parties, that the HSE management processes have been agreed and applied. Negotiations and adjustments should have been thoroughly discussed and already agreed at this stage.

It is recognized that the process outlined above can take a considerable amount of time and that the client needs to prepare a timeline, working backwards from when the project needs to commence. If, during the tender and award process, the timeline changes, a Management of Change (MOC) needs to be initiated. The MOC should also address what will need to be done to address revised operations planning and preparation time. This is critical, because while the ITT process is important, it does not have direct HSE consequences. HSE consequences may be experienced later with compressed timelines, inadequate preparation, and contractors and subcontractors that have not been allowed adequate time to prepare for executing the scope of work.

2.4 Pre-mobilization

During the Pre-mobilization phase both the client and contractor should be meeting and regularly discussing the project HSE documentation to ensure that the contractor HSE-MS covers the:

- minimum expectations in Tables 1 and 2
- additional requirements from the client HSE-MS (column 3 of these tables), and
- hazards from the joint risk assessment.

This phase is the most critical one in the whole process, where both client and contractor can jointly influence risk management before operations begin, as shown in Figure 2 below.

A complete HAZID process (including subcontractors where possible) should be jointly performed where all hazards are risk-ranked along with controls and mitigation measures that bring them to an agreed As Low as Reasonably Practicable (ALARP) level.

A Project HSE Plan should be developed based on the contractor's HSE-MS with active input and participation by the subcontractors and client.

All contractual details should be finalized.

All permits and regulatory requirements should be completed and in hand, either by the client or the contractor, as per the scope of work in the ITT process.

Any required inspections of equipment by subject matter experts (internal or external) should be done (or planned for at mobilization) to ensure that all HSE critical equipment is inspected and meets industry standards.

An operational readiness review should be carried out to assure both client and contractor that all requirements for the starting the work are in place.

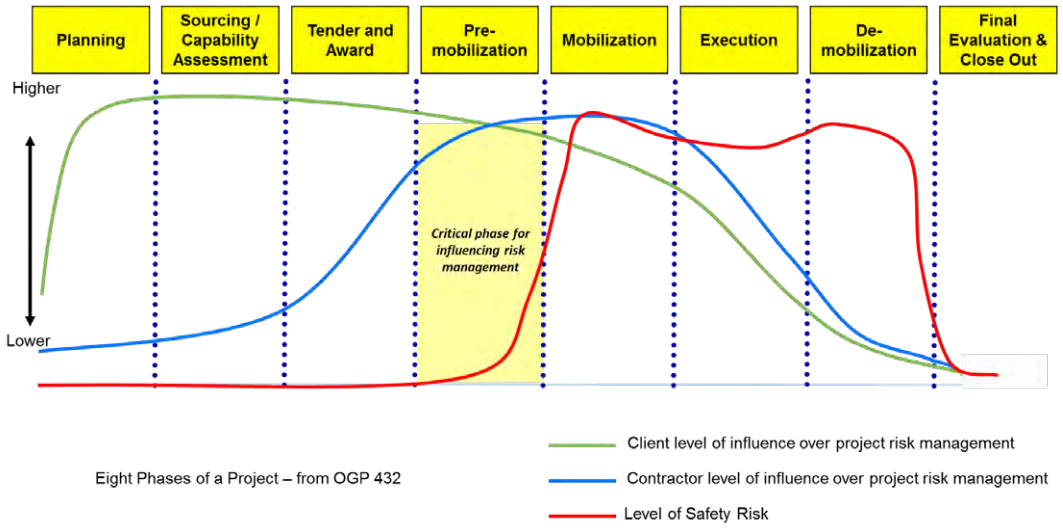

Figure 2: Eight phases of a project showing qualitative influence by client and contractor on project risk management and the level of safety risk[1]

2.5 Mobilization

The primary goal of the mobilization phase is the verification and acceptance that all contractually required personnel are present and that equipment is in working order according to contractual requirements. Also during mobilization, the operational and HSE objectives and requirements and the project risk assessment are communicated to all relevant personnel including client, contractors and subcontractors. Certain operational and HSE information should be communicated to regulators, local communities and other relevant stakeholders.

Mobilization exposes the project to various HSE risks in a short period of time. Depending on the size and complexity of the project, a mobilization plan should be developed during the pre-mobilization phase to ensure that risk controls and mitigation measures listed in the relevant risk assessment(s) are well implemented.

During mobilization, all contractor staff members are made aware of the client's expectations, including regulatory and other requirements, which are presented via project start-up meetings. All field personnel involved with the mobilization effort should attend a start-up meeting. Ample time should be allocated to ensure the appropriate information is conveyed during the start-up meetings and that the personnel have an opportunity to ask questions and actively participate.

[1] Harrison, D., 2009. *HSE in Geophysics: Safety in Acquisition Planning*. Paper presented in a workshop (Geophysics and HSE – What Can We Do in Geophysics to Prevent HSE Incidents Occurring During Exploration and Development?) at the 71st EAGE Conference & Exhibition, Amsterdam, the Netherlands, 8–11 June.

Any contractually agreed incentive scheme should be communicated including ties to defined performance metrics.

Final auditing and acceptance activities take place, bridging (interface) between all parties is finalized, testing of the Emergency Response communications and regulatory notifications are made.

At the end of this stage, the client formally informs the contractor to initiate the deployment of equipment and for the data collection operations to commence. The client also accepts the operational and HSE plans, crew, and technical resources.

2.6 Execution

The primary goal of project execution is to complete the seismic data acquisition programme in accordance with established plans and contractual obligations, which includes HSE and Technical areas.

The project execution stage involves monitoring and evaluating ongoing operations to confirm that the work is being conducted according to the agreed contract, method statements and mitigation plans, and that the survey objectives are being met. It also includes:

- continued self-verification
- subcontractors' oversight, assurance and audit
- regular risk assessment reviews
- contract compliance audits
- ensuring the agreed MoC process is used
- toolbox talks and regular HSE meetings.

The client will monitor and confirm that the work performed is conducted according to the agreed contract and plans (HSE plan, Technical QA/QC Plan, etc.), and that any additional HSE or technical needs that arise are properly addressed.

Client staff or field representatives should not directly manage the work of contractor employees or subcontractors, unless there are specific reasons for doing so. Their primary role is to verify that the survey objectives are being met, and maintain oversight of supplier performance.

Subcontractor management is the responsibility of the lead contractor and remains an area of potential higher risk.

2.7 De-mobilization

Demobilization involves successfully concluding the operation when the contract requirements have been fulfilled and safely removing personnel and equipment from the area, in an environmentally sound manner.

Demobilization is a time of heightened risk as changes are made, large amounts of equipment are simultaneously retrieved and stowed, and many control systems are gradually dismantled. As a result, demobilization should be planned during the execution phase so that hazards are identified and controls and mitigating measures are implemented.

Client representatives on site will monitor and confirm that the contractor demobilizes safely and that all planned remediation takes place where required.

2.8 Final evaluation and close-out

The close-out stage involves the performance of a joint evaluation of the contractor's and client's performance, and the successful capture, documentation, sharing and storing of any lessons learned for future reference.

Sufficient time and appropriate location should be allocated for the joint evaluation, following an agreed structure and agenda involving key project stakeholders from client and contractor to ensure feedback includes areas of HSE, technical and operational performance.

Final reports should be generated and shared to serve as the basis for improving performance on future surveys.

Project deliverables should be sent to Ministries, National Oil Company and /or partners as required by regulations and Joint Operating Agreements and their receipt confirmed. Similarly, statutory reports will be filed with regulatory agencies as required.

3. HSE plans

3.1 Project specific HSE Plan and optional Crew HSE Plan

A Project HSE Plan is generated by the contractor for each project to describe project specific requirements which also defines the hazard controls and mitigations specific to the project.

A Crew HSE Plan is a framework identifying how the crew meet the applicable requirements of the contractor's corporate HSE-MS. This is an optional standalone document. Some projects may have the Crew and Project HSE Plan integrated into a single document for convenience of operation. This is more likely on a land operation than a marine operation.

This choice is primarily the contractor's decision, but the final document structure should be agreed between client and contractor before the project starts, and ideally during the sourcing phase.

The selected documentation structure must demonstrate that the contractor's corporate management system is effectively implemented at the crew or facility level for the project. It should be appropriately and efficiently documented while also addressing all project specific HSE aspects.

3.1.1 Project HSE Plan

The Project HSE Plan addresses project specific requirements (e.g. legal, contractual, environmental, geographical) and identifies controls and mitigation measures to manage the risks identified in the Project Risk Assessment.

The main function of the Project HSE Plan is to:

- demonstrate that all involved parties have the necessary HSE leadership, risk management procedures, operating instructions, emergency plans and controls in place to achieve the project programme without compromising HSE performance
- document and address project specific hazards and risk controls that are not covered or not adequately covered in the HSE-MS of the contractor or which are agreed to differ (temporarily) from the HSE-MS
- identify the project emergency response plans (including interfaces between parties and stakeholders) and recovery plans, with clear identification of the roles and responsibilities of third parties that may be involved
- document available operational support such as medical resources and aircraft or helicopter landing sites
- identify legal requirements, such as reporting to external parties; specific environmental restrictions, etc.

- provide assurance of the effective working of the interface between the HSE-MS of client, contractor and subcontractors at the project level
- analysis of differences and gaps between the contractor HSE-MS as implemented and the client HSE-MS requirements (see 'interfacing')

The Project HSE Plan may be issued as an integral part of an overall project plan covering a wider scope (i.e. also including quality and technical issues).

It is recommended to maintain a clear distinction between the sections, and to utilize the structure for the HSE sections as proposed in IOGP 423-02, *Guide to preparing HSE plans and Bridging documents*.

3.1.2 Ownership of the Project HSE Plan

The ownership of the Project HSE Plan should be assigned to the contractor. The document should be generated with input from client, contractor and subcontractors.

The advantage of giving the contractor this responsibility is that they are using their own standard format, which:

- ensures that the crew staff have a similarly structured document from project to project which they can familiarise themselves within a minimum of time
- allows the contractor to decide how this document will fit into any overall project plan
- allows the contractor to take responsibility for deciding how to document project specific hazards and risk controls
- consistency between Crew HSE Plan (if in use) and Project HSE Plan.

Ultimate responsibility and ownership of the Project HSE Plan should be assigned to the senior contractor manager on site.

The document should be endorsed or approved by the level of contractor line management above the senior site manager (before the project start-up meeting).

A statement of fitness may be required by the client. This would be issued by the senior contractor manager after they are satisfied that all the aspects, as set out in this guideline, of the project HSE-MS, are in place.

3.1.3 Development of a Project HSE Plan

The Project HSE Plan is only valid for a single project, and may change significantly from project to project.

A suggested structure for the Project HSE Plan is provided in Appendix 1. IOGP 423-02 *Guide to preparing HSE plans and Bridging documents* provides additional guidance on developing an HSE Plan. The suggested format adopted from IOGP 423-02 is as follows:

Section 1 Executive summary

Section 2 Introduction and contract HSE Plan objectives

Section 3 Scope of and schedule of Work/Activity/Project

Section 4 HSE Management System:

- description of how contractor should interface with, and meet the Company's HSE requirements
- the 'bridging' section or reference to a specific document
- application of the management system within the contract, on the basis of the management system Elements. (An Annex 'on the basis of the MS Elements' built on the check list model could be added, in order to keep the Plan concise)

Section 5 Risk Management (hazards and effects) and HSE Critical Elements. Main treatment/control measures

Section 6 Emergency Response

Section 7 Performance Monitoring, Reporting and Continuous Improvement.

The project manager will ensure that all staff are aware of project specific responsibilities. Preferably they should be informed of these responsibilities in writing.

Communicating the Project HSE Plan is essential to make all project staff aware of its contents. Contractors should already be familiar with and understand their HSE-MS. Emphasis should be made on the parts of the project that are new or different to standard operations.

As changes are made to the Project HSE Plan, document control and distribution needs to be carefully managed to ensure outdated documentation is not in use.

3.1.4 Interfacing/Bridging

Interfacing is required where two or more parties are playing an active role in a project. Clients, contractors and subcontractors identify their interfaces and ensure that these are managed effectively and also identify potential third parties that may be affected, have influence, or play a role within the project.

The final bridging document should record the following:

- participating parties
- activities that are shared between two or more parties should be identified. Any potential conflicts between the HSE-MS systems of participating companies should be clearly resolved
- identification of who is responsible for specified activities
- lines of communication and contact points
- identification of which procedures will be used
- changes or introduction of new parties should be carefully interfaced using a management of change procedure
- client may require having primacy in some (serious) emergency incidents, and the situations where this will take effect should be clearly identified in the contract and Project HSE Plan or bridging document.

Key activities to be addressed in project interfacing include emergency situations, simultaneous operations, management of change and the reporting and investigation of incidents and recovery procedures.

The content of the bridging document, with agreement between client and contractor, may be included in the contractor owned Project HSE documentation, rather than as a standalone document.

Reference is made to IOGP 423-02, *Guide to preparing HSE plans and Bridging documents*.

3.1.5 Crew HSE Plan

This section provides guidance for the development of a Crew HSE Plan (which may be a standalone document or be integrated into the Project HSE Plan and/or overall Project Plan).

The contractor and subcontractors should have a developed HSE-MS for various working units (crews). This will be a system that follows the requirements of the corporate management system as it applies to the crew. It should refer to, and where appropriate, comply with IOGP Report 510.

This HSE-MS should provide a simple and easily accessible overview of documentation applicable to the crew. The HSE-MS can be in the form of an internet/intranet based HSE-MS, an HSE manual or a Crew HSE Plan. Electronic access to relevant documents is acceptable, provided the requirements of a Crew HSE Plan are met.

Site specific documentation should be used where there is a temporary setup of an organization or project. The Crew HSE Plan should be specific to the crew, which may be a seismic unit working on land or transition zone, a single or multi-vessel seismic operation offshore.

The Crew HSE Plan or equivalent as described above can be used to demonstrate that:

- the contractor or subcontractor has an effective HSE-MS that is being applied to the project
- relevant project risks (people, environment, assets and reputation) have been identified, the associated risk has been assessed and evaluated and that measures to reduce risk to a level that is ALARP have been implemented by responsible persons.

The Crew HSE Plan, or equivalent, should demonstrate that the contractor and the regular subcontractors are making efforts to continuously improve the management of HSE.

Senior management commitment to the corporate HSE-MS should be the main driving force behind preparation of a Crew HSE Plan (or equivalent). This can be demonstrated in part by making resources available for its development and participating in introducing it to the crew. However, an effective Crew HSE Plan or equivalent should be prepared by those directly involved with the specific crew and should be owned by those responsible for it.

3.1.6 Development of a Crew HSE Plan

Purpose

The Crew HSE Plan should be the framework for documenting the HSE-MS at crew level. The scope and complexity of the development process will depend on the size and type of the operation as well as the level of experience of the crew members and the level of continuity of the crew as an entity.

The Crew HSE Plan should be considered as a reference, which identifies more detailed documents. It is not necessary to include extensive material from other standalone documents except to facilitate comprehension or compliance.

Scope

The target audience of the Crew HSE Plan should be the crew line management who are accountable for communicating the plan to all crew personnel.

In practice, the most effective way to achieve dissemination to the whole crew population has been the development of 'subsets' of the plan, containing at least relevant hazard sheets, job descriptions, procedures and work instructions for the various departments.

The Crew HSE Plan should be readily available to client representatives assigned to the project.

It is important that crew members assigned to a project or location are given a proper induction to the relevant parts of the HSE-MS with a focus on knowing where to find relevant documentation. The Crew HSE Plan can be a useful summary to support this induction.

3.1.7 Documentation and contents for Crew HSE Plan

A suggested list of contents for a Crew HSE Plan is:

Section 1: Purpose, scope, and responsibilities

This section should include:

- Purpose and scope of the document
- Definition of responsibilities
- An outline of the Crew HSE Plan
- Crew HSE Plan review cycle and responsibilities.

Section 2: Description of the Crew HSE-MS and its relation to the corporate HSE-MS

The proposed structure of this section follows the headings of IOGP Report 510, *Operating Management System Framework for controlling risk and delivering high performance in the oil and gas industry.*

The intention is not to include material directly from the corporate HSE-MS, but to point to relevant policies and procedures and state how these will apply to the project. For example: under 'organization', a crew organization chart should be included or referenced.

Section 3: Description of the facilities and operations

This section should contain information or refer to other sources, which describe the crew, and its components, machinery, fittings, systems and equipment including types, numbers and location of all safety equipment. It should specifically describe the essential features relevant to the HSE and emergency management of the facility and operations. This enables an understanding of how hazards assessed as major risk, discussed in section 4, could impact the operations and its HSE-MS.

Section 4: Risk management

The identification of major hazards in each work place, the assessment of the level of risk that these hazards pose to each work place, (the hazard may be the same but the level of risk and its controls may be different in different locations) and management of these hazards is the foundation stone for building a good HSE-MS.

The identification of project specific hazards and associated risks should be highlighted in the Project HSE Plan. All other hazards and associated risks should be referenced in the hazard/risk register that forms part of the HSE-MS.

Where the crew engages in routine activities which are assessed as major risk, a hazard register describing these hazards and risk should be included in the Crew HSE Plan.

Section 5: Remedial plan

This section should include:

- a description of the system used to track corrective action and the close out of items generated from hazard analysis, job safety analysis, audits, inspections, incident reports and investigations and other sources
- corrective actions, which clearly identify who is in charge of the corrective action and within what time frame the corrective action should be closed out
- a remedial plan listing long lead actions which are required to achieve the intended level of risk control and continual improvement of the HSE-MS.

3.2 Other specific plans

Depending on the risk assessment, the nature and type of seismic or other geophysical activity, the scope and size of the project and its physical location, other specific plans may or may not be required. For example, these include plans for Waste Management, Environmental Management, Security Management, Health Management, Social Responsibility.

Contractors should evaluate whether there is a need for a standalone Plan, or whether a Plan element, if required, can be combined or included effectively in a Project-specific HSE Plan. This should be agreed with the client before the project starts.

4. Document control

There are four important functions that document control provides:

1) It can help to ensure that the latest version of a document is being used.
2) It can trigger a scheduled review process.
3) It can help ensure that the document has been reviewed and approved by the appropriate expertise and management level.
4) It allows referencing between documents so they are kept user friendly and easy to read.

Documents that form part of the HSE-MS should be controlled. They should be clearly labelled as to their type, who is the custodian and approver of the document, the version of the document, the date of issue and if possible the date of printing.

Additionally, the document itself should contain a place to record changes made, by whom, when and whether the changes were significant enough to warrant an updated version of the document.

The control of all documentation associated with the project should be properly managed. A system should be maintained whereby document holders are notified of changes and they can access the most recent version of any project document.

Appendices

Appendix 1: Project HSE Plan – key elements

This appendix is a suggestion of headings and subject material that could be used as the basis for defining the key elements of the Project HSE Plan.

	Items	Checked
1. Executive summary		
Description of project, location, client, crew identified, operating environment, etc.		
2. Introduction and Project HSE Plan objectives		
Revision status	The document(s) clearly identified as to the date and revision status.	
Custodian	The contractor custodian of the Project HSE Plan and the name and role of the client project leader.	
Approval	The Project HSE Plan should be approved by a senior contractor representative who is on site and should be endorsed or approved by the level of contractor line management above the senior site manager.	
Purpose	The purpose of the Project HSE Plan should be stated, which is to provide a clearly defined Interface between the client, contractor and subcontractor(s) during project execution and to ensure that project specific hazards have been identified and that a management system is in place.	
Project Reference Documents	Examples include: • Project risk register • Client/contractor bridging document • Project MOPO (matrix of permitted operations) • Environmental impact assessment, and all other impact assessments. List any documents that are used in the project for HSE purposes (which are not incorporated into this plan).	
3. Scope of and schedule of Work / Activity / Project		
Description	A description of important project specific issues such as: • Project area including maps • Legal/regulatory licence requirements • Resources – crew member experience/crew continuity status • Logistics (Fuel, Food and Water) • Restricted areas • Terrain and metrological factors • Accommodation Types and locations • Types of equipment used. • Number and types of vehicles/vessels used • Cable/energy source configurations • Local physical major hazards, e.g. rivers, lakes, pipelines, offshore structures, shipping lanes, fishing activities, conflicting or parallel operations. If required for the benefit of relevant stakeholders, a basic description of the geophysical operation and any special characteristics, e.g. vibrator trucks; prevailing influence control points, bulldozers; shot hole drills; dual vessel; in-sea infrastructure, special environmental requirements; difficult terrain, etc.	

4. HSE Management System

Policies	Identify and reference applicable client, contractor and subcontractor HSE policies see Table 1 (actual policy documents can be appended if appropriate).	

Organization, resources and documentation

Reporting structure between client, contractor and subcontractor(s)	A diagram which shows the reporting structure between all involved parties indicating HSE focal points and including any external HSE and medical advisers, client representatives, project specific personnel, etc. Include a summary of HSE responsibilities and authorities of key project staff. Where applicable, describe the organizational Interfaces with e.g. supply vessels; platforms; onshore facilities; local government bodies; police, etc.	
Resources	Description of other client HSE and operational support resources. Other contractor and subcontractor staff resources should also be included if not already described in the crew HSE plan, e.g. additional HSE professional, paramedics, security personnel, topside medical support, specialized equipment	
Subcontractors	Provide details of project specific subcontractors, e.g. caterers, helicopter operators, support vessel etc. not described in the crew HSE plan. In the details for the subcontractors, consideration should be given to ranking the risk associated with the subcontractor activity and any additional mitigation required to manage these subcontractors. Reference Bridging documents where appropriate.	
Communications	A description of the client – contractor HSE communication and reporting schedule (frequency and method of information transfer).	
Standards and legislation	Describes specific standards (from client or others) and legislation applicable to the project (fisheries, environment etc., incident reporting.)	
Training and competence	Summarizes project specific training requirements not described in the crew HSE plan, e.g. HSE induction, tests, exercises, etc. Summarize project specific competence assurance processes.	

Planning

Project specific procedures	A summary of project specific procedures not addressed by the management system in use for the project, for example: • Duty rosters • Communications system • Crew change plans • Transfer of personnel • Weather constraints • Small boat operations • Operations near fixed structures • Helicopter movements • Camp construction and camp moves • Substance abuse testing • Waste management • Exclusion zones • Special PPE requirements • PTW and LOTO systems. Any other agreed and relevant restrictions not covered in any other plans.	

HSE critical information	A summary of project specific critical HSE information provided by the client to contractor, e.g. maps and charts; hazard notifications on structures; simultaneous operations; security threats, diving activities, ERW, previous lessons learned, etc.	
Test exercises	List any agreed emergency exercises to be carried out over and above those described in the crew HSE plan	
Permitted operations	Include MOPO for the project	
Management of Change/ Deviation process	List any project specific approvals/review requirements, e.g. Client approvals/review of the management of change/deviation.	
5. Risk Management (hazards and effects) and top risks		
Hazard identification	Describe project specific hazards, with their main treatment and control measures identified at project level which have not been adequately covered in the Crew HSE Plan (e.g. Hazard; Identification of road traffic black spots – Control is Project specific speed limits)	
Environmental impact assessments	Summarize any EIAs carried out which impact the project and list mitigations arising from such EIAs.	
Social responsibility impact assessment	Summarize any SIA's carried out which are linked to the project and list mitigations arising from the report.	
6. Emergency Response		
Summary	Summarizes emergency response procedures. Describes the role of the Client, Contractor and Subcontractor in an Emergency.	
Emergency Response	Describes the Emergency Response set up and the circumstances in which the Emergency Response should be initiated. Identify whose Emergency Response will be used in which circumstances. Describes the emergency services that are available in the event of an emergency, e.g. coastguard; medevac; hospitals; evacuation; fire-fighting; security response; spill response, etc. Set out the call out procedures.	
Contact Information	Contact telephone, email, radio, etc. for all relevant parties and stakeholders.	
7. Performance Monitoring, Reporting and Continuous Improvement		
Performance indicators	A description of the HSE performance indicators for the project (to the extent not covered under policy and objectives above). Identify the KPIs for the project.	
Joint review	A process and schedule for a joint review by client and contractor of HSE performance.	
Project audits	Describes the client, contractor and joint audit program.	
Incident reporting and investigation	Describes project incident reporting and investigation requirements as agreed by all parties, and the incident potential rating standards, including: • Team composition • Follow-up procedures • Spill reports • Recovery.	
Inspection programme	Summarize the project HSE inspection programme where different to that detailed in the Crew HSE Plan.	
HSE records	A summary of the project HSE records that will be maintained over and above those described in the Crew HSE Plan.	

Appendix 2: Allocation of responsibilities

An important element of the HSE-MS is the clear specification of individual responsibilities and consideration should be given to both general and project level responsibilities.

Prior to the creation of the job descriptions, stakeholders need to consider key elements such as:

1) Responsible, accountable, consulted and informed positions
2) HSE critical positions
3) HSE critical activities.

Responsible, accountable, consulted and informed positions

Allocation of responsibilities and authorities should be clearly identified, and the use of Responsible, Accountable, Consulted, Informed (RACI) diagrams is suggested. A RACI chart is a matrix of all the activities or decision-making authorities undertaken in an organization or project set against all the people or roles.

Definitions of the RACI categories:

- Responsible: person who performs an activity or who does the work
- Accountable: person who is ultimately accountable and has Yes/No/Veto
- Consulted: person that needs to feedback and contribute to the activity
- Informed: person that needs to know of the decision or action.

HSE critical positions

An HSE critical position is a position that can impact significantly on the execution of HSE critical equipment & activities (see Table 2) at the operational level and/or organizational level where operational decisions are made. These positions need to be defined in each company's management system.

Examples of HSE critical positions include, but are not limited to:

- Maritime Masters / Maritime Officers
- HSE Advisors
- Party Chief / Party Manager
- Project Managers
- Head of Departments
- Shift Leaders
- Chief Mechanics / Chief Vibrator Engineers
- Chief Navigators

- Chief Observers
- Shooter (explosives operations)
- Workboat Coxswain
- Fixed wing or rotary Pilots
- Drivers of vehicles (including vibrators and other heavy vehicles)
- Operators of hazardous equipment or special machinery
- Doctors or Medical Professionals
- Line management e.g. those involved in the PTW process as requesters (supervisors) and approvers (Masters, Party Chiefs and delegates).

HSE critical equipment, its operation and therefore the position of someone who works on or with that equipment drives the MOC process when changes are required. HSE critical positions also drive competency requirements.

HSE critical activities

HSE critical activities are activities that can have a significant impact on people, assets, environment and reputation.

Examples of HSE critical activities include, but are not limited to:

- Driving
- Crane operations
- Small boat driving
- Diving
- Permit to Work activities (working at height, confined space entry, working on energized equipment, etc.)
- Lone working
- Gas detector testing
- Monitoring alarms
- Armed security
- ERW/UXO detection.

Each of these activities, and any others that are identified as critical, should be assigned to a competent person in a Job Description. A list of HSE critical activities should be established for the Project. Individuals should be identified and assigned to the activity at a Project level. A list of activities and assignees should be maintained at Project level.

Geophysical operations involve a number of managerial activities while not considered “hazardous” in themselves, are critical for the proper and safe conduct of the Project.

Examples of HSE critical managerial activities include, but are not limited to:

1) Scouting of new area
2) Hazard identification and risk assessment
3) Deciding how the work will be carried out
4) Defining and providing training
5) Defining equipment standards and procuring equipment
6) Defining requirements for and establishing infrastructure and camp
7) Defining manning level requirements, and managing staff
8) Operating camp facilities and medical services
9) Driving and journey management system
10) Scheduling field operations
11) Maintenance of equipment
12) Restoring site(s)
13) Determining HSE measures to compensate for inexperience or lack of crew continuity.

Job descriptions

There should be job descriptions for all positions but at a minimum they should be in place for all line management positions, all HSE critical positions and any position that conducts HSE critical activities.

It is recommended that each staff member be asked to sign their job description to indicate that it is understood and agreed, and that a copy of the signed job description is given to the staff member. (See Document control 6.1.)

Key elements for consideration when developing job descriptions are the following:

Job identification

This includes general information such as job title and classification, worksite location and management/reporting responsibilities.

Job responsibilities

Job responsibilities are how an organization defines the work that needs to be performed by a particular role and the functions for which an employee is accountable. The detailed task list is perhaps the most traditional way of describing job responsibilities. Task lists can be constructed by considering a typical day and writing down the tasks that are performed.

Competence

Certain activities and tasks will require minimum competencies. Competencies should be documented centrally for each position, but may also be included in job descriptions and linked to the relevant activity or task. Competency guidelines can be found in IOGP Report 292, *HSE competency management guidelines for the geophysical industry.*

Job related hazards

Employees should be responsible for verifying that all activities, tasks and major hazard controls assigned to them or their subordinates, are carried out according to specified performance criteria.

Procedures

Practical operational activities assessed as containing significant hazards, should be managed by a documented safe working procedure. The procedure should be reviewed throughout the term of the Project according to the employer's management system requirements.

Work instructions

Work instructions should be provided for those daily tasks that are carried out by the work force. Work instructions should be regularly reviewed. Toolbox meetings should identify any misunderstandings or conflicts which can then be promptly corrected.

Common low risk workplace hazards are not usually analysed in the hazard register, but control is established by good practice. Each supervisor should be made responsible for proper review and implementation of the work instructions applicable to their section. It may be advisable to formally link the applicable instructions to their job description.

Identification of responsibilities

Responsibilities should be stated clearly and be as specific as possible.

All personnel involved in the project have a duty to follow HSE procedures, and to stop the job if they feel at risk or uncomfortable until a way to continue is agreed with a supervisor.

Unless there is imminent danger, at no time should client company personnel or consultant field representatives directly supervise or manage contractor or subcontractor field personnel. Any communications should be passed through appropriate and agreed channels.

Appendix 3: Reference documentation

Notes: Only IOGP references available up to November 2017 have been used.

HSE Management:		
M1	Operating Management System Framework for controlling risk and delivering high performance in the oil and gas industry OMS in practice – a supplement to Report No. 510	Report IOGP 510, June 2014 Report IOGP 511, June 2014
M2	HSE management – guidelines for working together in a contract environment	Report IOGP 423, April 2017
M2-1	Contractor HSE capability assessment and scoring system - Supplement to Report 423	Report IOGP 423-01, April 2017
M2-2	Guide to preparing HSE plans and Bridging documents - Supplement to Report 423	Report IOGP 423-02, April 2017
M3	HSE competency management guidelines for the geophysical industry	Report IOGP 292, December 2014
M4	Guidelines for HSE Auditing in the Geophysical Industry	Report IOGP 245, September 1996
M5	Glossary of HSE Terms	Report IOGP 244, September 1996
M6	Travel Guide	Report IPIECA/IOGP Report 387, 2007
M7	Occupational health and safety management system - Requirements	Report OHSAS 18001:2007
M8	ISM Code	Report IMO (as amended)
M9	Human Factors – a means of improving HSE performance	Report IOGP 368, 2005
M10	Aide Memoir Fatalities Database	IAGC website http://www.iagc.org/aide-memoir.html
M11 (new)	Management of subcontractors and temporary workforce in geophysical operations – Supplement to Report 432	Report IOGP 432-01, November 2017
M12 (new)	Risk management in geophysical operations – Supplement to Report 432	Report IOGP 432-02, November 2017
M13 (new)	Shaping safety culture through safety leadership	Report IOGP 452, October 2013
M14 (new)	A guide to selecting appropriate tools to improve HSE culture	Report IOGP 435, March 2010
M15 (new)	Health and Safety Management Systems Interfacing	Report Step Change in Safety Committee, Re-issue 2003
M16 (new)	Guidance on Simultaneous Operations (SIMOPS)	Report IMCA M 203, March 2010
M17 (new)	HSE guidelines for metocean & Arctic surveys	Report IOGP 447, October 2011
M18 (new)	Management of risk when planning work: The right priorities (part of the Leadership and worker involvement toolkit)	Report UK Health & Safety Executive, November 2011
M19	Guidance for the use of the Geophysical Contractor Management Self-Assessment (GCMSA)	Report IOGP 538, August 2015
M20	Working Alone: Health and Safety Guidance on the Risks of Lone Working	Report UK Health & Safety Executive, May 2013 (indg73)
M21 (next available)		

Health:		
H1	Substance misuse	Report IPIECA/IOGP 445, 2010
H2	Health aspects of work in extreme climates	Report IPIECA/IOGP 398, 2008
H3	Managing health for field operations in oil and gas activities	Report IPIECA/IOGP 343, 2011
H4	HIV/AIDS management in the oil & gas industry	Report IPIECA/IOGP 374, 2005
H5	A guide to Malaria Management Programmes in the oil & gas industry	Report IPIECA/IOGP 382, 2006
H6	Managing fatigue in the workplace	Report IPIECA/IOGP 392, 2007
H7	Managing Workplace Stress	Report IPIECA/IOGP 378, 2005
H8	Medical Aspects of Fitness for Offshore Work: Guidance for Examining Physicians	Report OGUK Issue 6, 2008
H9	Guidelines for Drinking-water Quality	Report WHO, 4th Edition 2011
H10	Health Leading Performance Indicators	IPIECA/IOGP reports for the latest year(s)
H11	A Guide to Food and Water Safety	Report IPIECA/IOGP 397, 2009
H12 (new)	Fitness to work - Guidance for company and contractor health, HSE and HR professionals	Report IPIECA/IOGP 470, 2011
H13 (new)	Vector-borne disease management programmes	Report IPIECA/IOGP 481, 2012
H14 (new)	Managing tuberculosis	Report IPIECA/IOGP 394, 2010
H15 (new)	Fatigue in fly-in, fly-out operations	Report IPIECA/IOGP 536, 2015
H16 (new)	Guide to good practice on Hand-Arm Vibration	EU Good Practice Guide, Ver. 7.7, June 2006
H17 (new)	Guide to good practice on Whole-Body Vibration	EU Good Practice Guide, Ver. 6.7, November 2008
H18 (new)	Establishing an ergonomics programme for computer usage in an office environment	Report IOGP 441, July 2010
H19 (new)	Institute of Remote Health Care	IRHC website www.irhc.org.uk
H20 (new)	Legionella and the prevention of legionellosis	Report WHO, 2007 ISBN 92 4 156297 8
H21 (new)	Managing Naturally Occurring Radioactive Material (NORM) in the oil and gas industry	Report IOGP 412, March 2016
H22 (new)	Handling Naturally Occurring Radioactive Materials	Report IMCA SEL 024, September 2009
H23 (new)	International Commission on Radiological Protection	ICRP website www.icrp.org
H24 (new)	Radiation Protection of Workers	Report ILO, SafeWork Information Note No. 1, April 2011
H25 (new)	Infectious disease outbreak management	Report IPIECA/IOGP 559, August 2016
H26 (new)	Performance indicators for fatigue risk management systems	Report IPIECA/IOGP 488, 2012
H27 (next available)		

Environment:

E1	Environmental management in oil and gas exploration and production	Report IOGP 254, 1997
E2	Oil & gas exploration & production in mangrove areas – guidelines for environmental protection	Report IOGP 184, 1993
E3	Oil industry operating guideline for tropical rainforests	Report IOGP 170, April 1991
E4	Environmental management in Arctic oil and gas operations – good practice guide	Report IOGP 449, May 2013
E5	Guidelines for waste management with special focus on areas with limited infrastructure	Report IOGP 413, Rev. 1.1, March 2009
E6	Environmental Manual for Worldwide Geophysical Operations	Report IAGC, 2013 Edition
E7	International Convention for the Prevention of Pollution from Ships (MARPOL)	Report IMO, 1973 (as amended)
E8 (new)	The E&P Sound & Marine Life Joint Industry Programme (JIP)	JIP website www.soundandmarinelife.org
E9	The American Table of Distances	Report Institute of Makers of Explosives, Safety Library Publication 2, 2011
E10	Minimum Offset Guidelines for Land Seismic Sources	Report IAGC, December 2007
E11 (new)	Environmental-Social-Health Risk and Impact Management Process	Report IOGP 389, April 2007
E12 (new)	An overview of marine seismic operations	Report IOGP 448, April 2011
E13 (new)	Overview of IOGP's Environmental-Social-Health Risk and Impact Management Process	Report IOGP 529, November 2014
E14 (new)	Fundamentals of underwater sound	Report IOGP 406, May 2008
E15 (new)	Model based assessment of underwater noise from an airgun array soft-start operation	Report IOGP 451, February 2011
E16 (new)	Seismic Surveys & Marine Mammals - Joint IOGP/IAGC position paper	Report IOGP/IAGC 576, January 2017
E17 (new)	Recommended monitoring and mitigation measures for cetaceans during marine seismic survey geophysical operations	Report IOGP 579, March 2017
E18 (next available)		

Security:

SEC1	Firearms and the use of force	Report IOGP 320, Rev 2, February 2010
SEC2	Response to demonstrations at offshore facilities	Report IOGP 309, March 2010
SEC3	Response to demonstrations at company premises	Report IOGP 308, March 2010
SEC4	International Ship and Port Facility Security (ISPS) Code	Report IMO, 2003 (as amended)
SEC5	Piracy and Armed Robbery against Ships - Guidance to shipowners and ship operators, shipmasters crews on preventing and suppressing acts of piracy and armed robbery against ships	Report IMO MSC.1/Circ.1334, June 2009
SEC6	Statement of Principles; Security of Seismic Operations	Report IAGC, April 2014
SEC7 (new)	Country Evacuation Planning Guidelines	Report IOGP 472, Version 1.1, September 2012
SEC8 (new)	Integrating security in major projects – principles and guidelines	Report IOGP 494, April 2014
SEC9 (new)	Security Management System – processes and concepts in security management	Report IOGP 512, July 2014

SEC10 (new)	Effective guard force management – principles and guidelines	Report IOGP 537, July 2015
SEC11 (new)	Security and Explosive Remnants of War (ERW) Guidelines for the Geophysical Industry	Report IAGC, April 2014
SEC12 (new)	Conducting security risk assessments (SRA) in dynamic threat environments	Report IOGP 555, June 2016
SEC13 (new)	International Mine Action Standards	IMAS website www.mineactionstandards.org
SEC14 (next available)		

Safety – general:		
S4	Guidelines on Permit to Work (PTW) systems	Report IOGP 189, January 1993
S20	Lifting and hoisting safety recommended practice	Report IOGP 376, April 2006
S21	Protection against lightning. General principles	Report British Standard BS EN 62305-1:2011, June 2011
S22	Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Commercial Electric Detonators (Blasting Caps)	Report Institute of Makers of Explosives, Safety Library Publication 20, December 2011
S23	Safe Diving Distance from Seismic Surveying Operations	Report DMAC 012, Rev. 1, July 2011
S26 (new)	IOGP Life-Saving Rules	Report IOGP 459, Ver. 2, April 2013
S28 (new)	Safety performance indicators Safety performance indicators – fatal incident reports Safety performance indicators – high potential events reports	Reports IOGP for the latest year(s)
S30 (new)	Dust Suppression on Seismic Drilling Rigs	Report CAGC Best Practice No. 13, First published January 2006
S33 (new)	Convention concerning the Protection of Workers against Occupational Hazards in the Working Environment Due to Air Pollution, Noise and Vibration	Report ILO Convention No. 148, 1977 (as amended)
S34 (new)	Convention concerning Safety in the Use of Asbestos	Report ILO Convention No. 162, 1986 (as amended)
S35 (new)	Acoustics – Measurement of noise on board vessels	Report ISO 2923:1996
S36 (new)	Lighting at work	Report UK Health & Safety Executive HSG38, Second edition,1997 ISBN 978 0 7176 1232 1
S37 (not currently used)	Available for future use	
S50 (new)	DROPSonline - Dropped Objects Prevention Scheme	DROPS website https://dropsonline.org
S51 (new)	Institute of Makers of Explosives (IME)	IMW website www.ime.org
S52 (new)	Best Practice for Building and Working Safely on Ice Covers in Alberta	Report WorkSafe Alberta SH010, October 2009 ISBN 978 0 7785 8738 5
S59 (next available)	See all safety references listed below	

Safety – land:		
S3	Land transportation safety recommended practice	Report IOGP 365, Ver. 2, September 2014
S3-1	Road hazard assessment	Report IOGP 365-1, January 2006
S3-2	Journey management	Report IOGP 365-2, January 2006
S3-3	Driver fitness for duty test	Report IOGP 365-3, January 2006
S3-4	Road/vehicle accident checklist	Report IOGP 365-4, January 2006
S3-5	Common KPIs for Motor Vehicle Crashes	Report IOGP 365-5, Ver. 2, January 2016
S3-6	Questionnaire/checklist assessment for the implementation of Report 365	Report IOGP 365-6, June 2016
S3-7	Variations for off-road operations	Report IOGP 365-7, September 2012
S3-8	Driver trainer recommended approach and profile	Report IOGP 365-8, September 2012
S3-9	Driver qualification process	Report IOGP 365-9, September 2012
S3-10	Journey management process	Report IOGP 365-10, September 2012
S3-11	Commentary drive assessment	Report IOGP 365-11, September 2012
S3-12	Implementing an in-vehicle monitoring program	Report IOGP 365-12, Ver. 2, March 2014
S3-13	FAQs on IOGP website (not a document)	Report IOGP 365-13
S3-14	Vehicle specification and upfitting	Report IOGP 365-14, September 2014
S3-15	Bus and coach safety	Report IOGP 365-15, September 2014
S3-16	Emergency Response Vehicles	Report IOGP 365-16, September 2014
S3-17	Mobile Construction Equipment	Report IOGP 365-17, September 2014
S5	Land Geophysical Safety Manual	Report IAGC, 10th Edition, 2012
S24	Proposed Code of Practice for converting vehicles for transporting survey personnel (on and off road)	Report TRL UPR/VE/049/06, February 2007
S31 (new)	Temporary onshore accommodation – Selecting the camp type	Report IOGP 541, December 2015
S32 (new)	Temporary onshore accommodation – Design, layout, accommodation, facilities and services	Report IOGP 542, December 2015
S46 (new)	Geophysical Mulching Operations	Report CAGC Best Practice No. 2, last updated June 2014
S47 (new)	Tree Felling and Chainsaw Use, IAGC Chainsaw Operator Competency Checklist, Level 1	IAGC website www.iagc.org
S48 (new)	WorkSafe BC Faller Training Standard	Work Safe BC website www.worksafebc.com/en
S49 (new)	Terrain Assessment Guidelines	Report CAGC Guideline 1, January 2009

Safety – marine:		
S2	Guidelines for Marine Small Boat Operations	Report IAGC, September 2013
S2-1 (new)	Guidelines for Marine Small Boat Operations Appendix 1 - Small Boat Design	Report IAGC, September 2013
S2-2 (new)	Guidelines for Marine Small Boat Operations Appendix 2 - Operational and Environmental Constraints	Report IAGC, September 2013
S6	Marine Geophysical Safety Manual	Report IAGC, 10th Edition, 2012
S7	International Convention for the Safety of Life at Sea (SOLAS)	Report IMO, 1974 (as amended)
S10	Watercraft & water in geophysical operations – A guideline to operations & management	Report IOGP 355, July 2004
S11	Lifeboats: Measures to Prevent Accidents	Merchant Shipping Notice UK Maritime and Coastguard Agency; MSN 1802 (M), August 2006
S12	Service Vessel Marine Safety Guidelines	Report IOGP 213, 1994
S13	Standards for Offshore Helicopter Landing Areas	Report Civil Aviation Authority, CAP437, 7th Edition, February 2013
S14	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW)	Report IMO, 2010 (as amended)
S15	International Maritime Dangerous Goods Code (IMDG)	Report IMO, 1965 (as amended)
S16	Convention on the International Regulations for Preventing Collisions at Sea (COLREGs)	Report IMO, 1972 (as amended)
S17	Guidelines for The Design and Operation of Dynamically Positioned Vessels	Report IMCA M 103, Rev. 2, April 2016
S18	Code of Safe Working Practices for Merchant Seamen	Report UK Maritime and Coastguard Agency, 2010 ISBN 978-0-11-553170-5
S19	International Code of Practice for Offshore Diving	Report IMCA D 014, Rev. 2, February 2014
S23	Safe Diving Distance from Seismic Surveying Operations	Report DMAC 012, Rev. 1, July 2011
S25	Diving Recommended Practice	Report IOGP 411, June 2008
S27 (new)	Maritime Labour Convention (MLC)	Report IMO, 2006 (as amended)
S29 (new)	Guidelines for Marine Small Boat Training and Competency	Report IAGC, September 2013
S38 (new)	Personal flotation devices -- Part 5: Buoyancy aids (level 50) -- Safety requirements	Report ISO 12402-5:2006 (as amended)
S39 (new)	Small craft – Stability and buoyancy assessment and categorization -- Part 1: Non-sailing boats of hull length greater than or equal to 6 m	Report ISO 12217-1:2015
S40 (new)	A Code of Practice for small workboats in commercial use to sea and all pilot boats	Report UK Maritime and Coastguard Agency, June 2014
S41 (new)	Integrated Survival System - Marine Geophysical Operations	Report IAGC, 2012
S42 (new)	Risk Assessment Data Directory - Ship/installation collisions	Report IOGP 434-16, March 2010
S43 (new)	Guidelines for Ship/Installation Collision Avoidance	Report UKOOA, Issue 1, February 2003 ISBN 1 903003 20 2
S53 (new)	Support Vessel Guidelines	Report IAGC, February 2016
S54 (new)	Guidance on the Transfer of Personnel to and from Offshore Vessels and Structures	IMCA SEL 025, IMCA M 202, March 2017 (revision in progress)
S55 (new)	International Code for Ship Operating in Polar Waters (Polar Code)	Report IMO, 2014 (as amended)

S56 (new)	International Life-Saving Appliance (LSA) Code	IMO Resolution MSC. 48 (66), adopted 1996 (as amended)
S57 (new)	Rules for Classification of Ships, Part 6 Chapter 2, Redundant Propulsion	DNV Report, January 2012
S58 (new)	Guidelines for the Design of the Means of Access for Inspection, Maintenance and Operation of Commercial Ships	Bureau Veritas Report, April 2008

Safety – aviation:

S1	Aircraft management guidelines	Report IOGP 390, Ver. 5, August 2013
S8	Helicopter guidelines for land seismic & helirig operations	Report IOGP 420, Ver. 1.1, June 2013
S13	Standards for Offshore Helicopter Landing Areas	Report Civil Aviation Authority, CAP437, 7th Edition, February 2013
S44 (new)	IAGSA Safety Policy Manual	Report IAGSA, 2014 (as amended)
S45 (new)	Helicopter Certification Agency (HCA)	HCA website www.helidecks.org

Social responsibility:

SR1 (new)	The Universal Declaration of Human Rights (UDHR)	United Nations http://www.un.org/en/universal-declaration-human-rights
SR2 (new)	Local content strategy	Report IPIECA, 2011
SR3 (new)	Community grievance mechanisms in the oil and gas industry	Report IPIECA, 2015
SR4 (new)	Community Grievance Mechanisms toolbox	IPIECA website, 2014 http://www.ipieca.org/publication/community-grievance-mechanism-toolbox
SR5 (new)	A guide to social impact assessment	Report IPIECA, 2004
SR6 (new)	Indigenous Peoples and the oil and gas industry	Report IPIECA, 2nd Edition, March 2012
SR7 (new)	Integrating human rights into environmental, social and health impact assessments	Report IPIECA, 2013
SR8 (new)	Voluntary Principles on Security and Human Rights – Implementation Guidance Tools	Report IPIECA, January 2012
SR9 (new)	A cross-sector guide for implementing the Mitigation Hierarchy	Report IPIECA, 2015
SR10 (new)	ILO Declaration on Fundamental Principles and Rights at Work	Report ILO, 1998 (as amended)
SR11 (next available)		

Useful websites for many references:

IOGP	http://www.iogp.org
IAGC	http://www.iagc.org
IMCA	http://www.imca-int.com
CAGC	https://www.cagc.ca
Guidance on HSE for airborne geophysical surveys can be found at http://www.iagsa.ca	
Guidance on HSE for ground electrical surveys can be found at http://www.ggssa.org	

Appendix 4: Model HSE contract clauses

In this guidance document, unless quoted from another source, the word 'should' is consistently used. In a contract, client companies may read 'should' as 'shall' unless exceptions are agreed.

The client and contractor should also be able to list any exceptions to these requirements by using column three in Tables 1 and 2. This should provide a consistent way for the client and contractor to review ITT and contracts established for the work.

The following is an example of three articles of agreement, which can be incorporated into a tender/contract for geophysical operations. These articles are intended to ensure compliance with the HSE requirements of this guideline, as a condition of contract. A further two potential articles (4 and 5) contain examples of the application of exception clauses, in column three, for client and contractor respectively.

Article 1 – Client HSE policy

The client HSE policies (or an explicit reference to them) are provided here.

Article 2 – Applicable HSE standards

The HSE standards applicable for the performance of the project under this contract should, as a minimum consist of the standards defined in:

a) All applicable legislation, rules, regulations and standards in the area of operations

b) Contractor's own internal HSE standards and common routines, which should be made openly available and accessible to client

c) General industry HSE standards adopted by client, as described in Article 3

d) Client proprietary HSE standards as listed in Article 4.

e) Geophysical industry standards derived from IOGP Report 432, Tables 1 and 2, including variations agreed between the client and contractor as defined in column 3 of Tables 1 and 2, as provided in Article 5.

Applicable legislation and regulations in the area of operations should always prevail, unless a formal exemption is granted to the contractor or client by the relevant authorities. However, where the standards defined under b), c), d) or e) above are more stringent and are not in conflict with a), the most stringent standard defined in any of these should prevail. Standards defined under d) above should prevail over those defined under b), c) and e) unless agreed otherwise.

Where an item or activity is not covered by any of the standards above, or when the defined standards are considered or found to be inadequate, the contractor should immediately notify client of such absence or inadequacy of defined standards. The client and contractor should then jointly develop and agree on additional standards to cover the item or activity and reduce the associated Risk to ALARP before the item or the activity is included or continued in the performance of the project. The client should make a reasonable contribution towards the additional cost of implementing such additional standards.

Article 3 – Industry minimum HSE standards adopted by client

The general industry standards adopted by client are listed in Appendix 3.

Many of the documents listed in Appendix 3 were produced by organizations that do not pretend to have any mandatory powers and only produce recommendations in which the word 'should' is used frequently. Where relevant, applicable and reasonable and to the extent not in conflict with applicable legislation, rules and regulations, in the context of this contract the recommendations in the referenced documents (including in Tables 1 and 2 below) should be considered default solutions and are to be used by contractor unless he can demonstrate he has effective alternative controls.

Article 4 – Examples of possible client exceptions

	Minimum expectation for the implementation of an HSE-MS	**Remark, alternative or exception**	**Reference(s) to requirements**
Table 1			
E3.1.3 Staffing levels	Staffing levels should be defined appropriately as not to compromise safe execution of the operations. Work rotation schedules should be discussed and agreed.	Contractor should have a full time, dedicated crew HSE advisor onboard the vessel for the whole duration of the project	
Table 2			
2.14.12 Survival suits (with insulation)	Where operational conditions demand their use, the vessel should be equipped with survival suits of appropriate sizes for all persons on board. The survival suits should be readily accessible and their position and donning instructions should be clearly displayed.	Survival suits are to be provided for 200% of the total number of berths on board and should be placed as to be readily accessible in domestic areas, the work place and muster points.	S7

Article 5 – Examples of possible contractor exceptions

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	Reference(s) to requirements
Table 2			
2.13b.8 Vessel tracking system	A tracking system is recommended to be installed on all small boats but is considered essential for watercraft operating in high risk situations (based on risk assessment). A VTS central system/operator to monitor and control crew journeys in real time.	The workboats for this project are not fitted with an active VTS. Due to the small prospect area visual monitoring of workboats by other vessels including the contractors regular JM reporting to the recording vessel this is accepted as an exception. VTS should not be required on workboats for this contract on this prospect.	

Appendix 5: Minimum HSE expectations

This appendix contains two Tables that provide the recommended minimum HSE requirements for geophysical operations for management systems (Table 1) and for the control of specific hazards (Table 2) found in geophysical operations.

Most of the HSE minimum expectations listed in the Tables have one or several References coded in column four. These references relate to HSE literature from various sources. These references are listed for informative purposes and are not considered to be mandatory unless agreed by Client and Contractor.

A Microsoft® Word® version of Tables 1 and 2 is available from the IOGP website to facilitate cut and paste of line items into contracts where exceptions or variations are applicable for a specific contract and recorded in column three. No changes should be made to any text of the table; only additional text describing the variation or exception may be entered to column three.

Changes or variations may be required or requested by either party and debated. However, once in a contract they constitute 'agreement' between the parties involved.

Such entries to column three may be general for a line item such as *"Not applicable for this contract"*, or specific such as *"single engine helicopters are accepted for use under this contract"*.

IOGP 432 provides guidance which is endorsed by clients, contractors, the IOGP, IAGC and IECO. The text of the document may not be altered or edited in any way. However, the Tables may be adjusted by agreement between contracting parties as described above.

Column four also includes the word GENERAL, LAND or MARINE so that the tables can be sorted by a company that utilizes them in a model contract.

Table 1: Guidelines for Minimum Expectations for HSE-MS[1]

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
Element 1 – Commitment and accountability			
E1.1 – The HSE-MS is in place across the organization, with priorities established, authorities and accountabilities assigned, and resources allocated to meet HSE-MS Expectations.			
E1.1.1 Accountabilities and responsibilities	• Contractor and client should adopt a RACI approach for: • Defining and continuously improving their respective HSE-MS • Ensuring their effective implementation at corporate and site levels.		M2
E1.1.2 Provision of resources by senior management	Senior management should allocate the necessary resources, such as time, people and money to HSE matters.		M1
E1.2 – Managers commit to ensuring a culture is developed and maintained to enable safe, reliable, responsible operations and continuous improvement.			
E1.2.1 Visible expressions of commitment by senior management	Examples of visible senior management commitment include: • HSE matters placed high on personal agenda • All senior managers set a personal example to others in day-to-day work • Putting HSE matters high on the agenda of meetings, from the board downwards • Being actively involved in HSE activities and reviews, at both local and remote sites • Management engagement with local stakeholders and subcontractors.		M1
E1.2.2 Line management responsibility –empowerment of individuals (authority and obligation to stop work and intervention)	HSE is a line responsibility. Management should empower all individuals with authority and advise them of their obligation to stop or intervene in any activity that could potentially harm people, the environment or assets. There should be no retaliation against individuals and there should be line management support for individuals who activate this policy. Implementation of this policy should not endanger others.		
E1.3 – The workforce is committed to performing activities in accordance with company policies, standards and objectives, and in compliance with external requirements.			
E1.3.1 Workforce participation	Managers and supervisors should build and maintain an atmosphere of mutual trust, consultation and encourage active workforce's participation in: • Improving the reporting of safety issues, and • Resolving them in order to promote their ownership of those issues. Managers and supervisors should feed-back their suggestions to demonstrate their contribution to the learning and improvement process. Workforce is made responsible for their own safety and the safety of those around them.		
E1.3.2 Commitment and ownership of HSE goals and objectives	SMART (specific, measurable attainable, realistic and timely) HSE goals and objectives are aligned throughout the organization down to the field level. They are visibly demonstrated and are being achieved. A crew should have pre-determined goals and objectives which may include leading and/or lagging indicators, covering HSE. Supervisors and senior crew personnel have individually owned HSE targets and time frames. Input to individual HSE objectives should be sought from those directly involved in their achievement whenever possible and endorsed by management.		M1

[1] Within the quoted 510 Expectation, the term 'OMS' has been replaced with 'HSE-MS' to match the scope of this document.

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E1.4 – A code of conduct is in place to establish behavioural, ethical and compliance obligations for employees.			
E1.4.1 Code of conduct	Client, contractor and subcontractor companies should have a code of conduct in place that is documented and communicated, including a process for reporting breaches of the code.		
E1.5 – Accountabilities are clearly defined and aligned with job responsibilities, authority levels and performance objectives. Personal commitment to meeting HSE-MS Expectations is visible and demonstrated at all levels in the company.			
E1.5.1 Accountabilities	HSE accountabilities as appropriate are clearly referenced in job descriptions.		
E1.5.2 HSE performance	HSE performance is measured against set objectives and recorded. Senior management reviews corporate and crew SMART HSE objectives. Improvement actions are identified and monitored.		M1
E1.5.3 Senior management active involvement in HSE matters.	Senior managers are actively involved in HSE matters by: • Attending HSE meetings • Personally instigating HSE audits and reviews • Promoting a positive culture at all levels • Recognizing HSE performance when objectives are achieved • Having a defined annual target for visits to their crews • Inviting client to scheduled contractor senior management visits. Crew/town/country-based managers/supervisors make regular visits to all operational work areas and sites.		M1
E1.6 – Communication and engagement mechanisms are established and sustained to ensure clear and consistent reinforcement of the HSE-MS and its Expectations.			
E1.6.1 Communications structure	Contractor should have a communication procedure covering all meetings and reports (type, frequency, attendance, distribution, agenda): • At both project and crew levels, and • Between contractor and subcontractors. Additionally contractor should: • Encourage employees' suggestions for measures to improve HSE performance • Communicate the importance of HSE considerations in business decisions.		M1
E1.6.2 Communications of HSE information relevant to the project	Effective two-way communication of HSE issues should be established between the client and contractor, and other stakeholders: • Client's expectations on HSE management should be communicated fully to the crew, including subcontractors • Procedures should be established for the distribution of HSE documentation and for the reporting and review of HSE issues • An overview of project HSE sensitivities and regulatory requirements should be delivered to all field personnel.		M11
E1.6.3 Languages	Client and contractor should agree the common working language for the project. The need to provide HSE critical information in required languages should be addressed. Consider the use of visual media and communications when literacy and/or multiple languages are an issue.		M11

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E1.7 – Processes are in place to manage documentation to ensure the latest versions are approved, identifiable and available, with defined retention, back-up and archival systems for management of information and related records.			
E1.7.1 Records	Records are kept of the main communications on HSE matters, e.g. • Hazard and risk registers • Induction, familiarization and training records • certificates • action registers • meeting notes and minutes • audits & inspection results • stop cards • incident reports & investigations • commitments register • environmental reports (e.g. marine mammal monitoring) • community monitoring reports • stakeholder engagements • grievance records and resolution reports • health records (where allowed by law) • verification results • management reviews, etc.		
E1.7.2 Document control	HSE critical documents should be controlled, archived (especially where legally required), and active documents should be regularly reviewed and available for audit, e.g. • Job descriptions for HSE critical roles • Crew HSE plan/project HSE plan • Emergency plans • HSE critical procedures • Permit to Work (PTW) forms after job completion.		
E1.8 – There is a commitment to learning from internal and external sources, with processes to incorporate continuous risk reduction and performance improvement.			
E1.8.1 Commitment to learning and continuous improvement	Participation in internal and external initiatives: • Membership of, and participation in, industry associations • Distribution and dissemination of internal and industry HSE alerts. Utilize internal and industry lessons learned from alerts, early in project planning to reduce risk.		M1
Element 2 – Policies, standards and objectives (PSO)			
E2.1 – PSO are defined, documented and communicated across all organization levels to address applicable aspects of business activities throughout their lifecycle.			
E2.1.1 HSE policy statements and standards	Policies and standards should address the following (collectively or individually): • Health, safety and environment • Substance abuse • Security • Social responsibility • Smoking • Driving (including texting) • Transportation • Obligation to stop work if at risk • Short service employees (SSE) • Social media usage • Waste management • Lone worker.		M2

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E2.1.2 Dissemination of PSO	HSE PSO are effectively disseminated to the crew in-line with the reference. Contractor and subcontractor(s) should be given a copy of the relevant client HSE PSO.		M2 M11
E2.2 - PSO are authorised by the highest level of management/organization appropriate to each activity and implemented to meet HSE-MS Expectations.			
E2.2.1 PSO approval	Written HSE policies should be dated and signed by the chief executive. Policies should be regularly reviewed.		
E2.3 - Policies and standards establish risk-based requirements, including the commitment to comply with applicable regulatory or other requirements.			
E2.3.1 Identification of HSE laws, rules and regulations	All relevant HSE laws, rules and regulations of any government or regulatory body having jurisdiction over the project operations should be recorded and identified in project plan.		M2
E2.3.2 Adherence to relevant laws, regulations, and permits	Client and contractor should adhere to applicable legislative and regulatory requirements, and permit conditions.		M2 S5
E2.4 - Objectives include measureable success criteria based on continuous improvement; maintaining standards; or compliance with policy, regulatory or other requirements.			
E2.4.1 Leading and lagging HSE Key Performance Indicators (KPI) and objectives set at corporate and project level	Documented corporate, country, and project HSE performance metrics should be in place. Establish and monitor HSE KPIs, in order to demonstrate continuous improvement. Objectives to be specific, measurable attainable, realistic and timely (SMART). Documented definitions of metrics used for measuring performance to be available. SMART leading and lagging KPIs to be defined in the Project HSE plan for regular monitoring at agreed frequency, for: • Social (e.g. related to local communities) • Health (e.g. lost time medical cases, number of clinic visits and categorization by occupational illnesses, number of drug and alcohol tests, etc.) • Environment (e.g. fauna detections, observations, any marine life and sound events, spills, damage to soils and water courses, waste management, etc.) • Security • Safety.		M1 M2 H10 S28
E2.5 – Where different entities operate on the same facilities (including joint venture partnerships), PSO are harmonized to ensure a consistent message and application.			
E2.5.1 Contractor hierarchy	Lead contractor is identified when multiple contractors are onsite. Interfaces should be defined on a project organization chart. Bridging documentation established.		M11 M2
E2.6 – Deviations from PSO are reviewed, subject to deviation/exemption process, and documented and approved by a competent authority.			
E2.6.1 PSO deviations	Contractor should have a formal process for managing temporary deviations from agreed standards and client should be informed before process is implemented.		

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
Element 3 – Organization, resources and capability			
E3.1 - Maintain an organization with defined responsibilities, accountabilities and authorities to effectively implement the HSE-MS and ensure compliance with legal and other requirements.			
E3.1.1 Corporate and project structure and responsibilities	The roles and responsibilities are clearly defined, which include but are not limited to: • Availability of organization charts at corporate levels • Availability of an organization chart on the crew for the contracted project showing the relationships (client, contractor and subcontractors), including all HSE functions, which should be included in the Project HSE Plan • All line managers and supervisors have responsibility for HSE • Job descriptions are in place and easily accessible in a language the individual can understand, showing the HSE accountabilities, responsibilities, training and competency requirements applicable to the role.		M1 M2
E3.1.2 HSE professionals	Client and contractor should agree the need for dedicated HSE support. Contractor should have access to competent HSE professionals who can assist line management in: • Crew HSE training • HSE inspections and audits • Risk assessments • Maintenance and monitoring of policies, procedures, guidelines and HSE plans • Subcontractor HSE assessment • HSE review/performance monitoring • Incident investigations • Emergency plans • Management of project specific Environmental, Social or Security issues.		M3
E3.1.3 Staffing levels	Staffing levels should be defined appropriately as not to compromise safe execution of the operations. Work rotation schedules should be discussed and agreed.		
E3.2 – Recruitment, deployment, career development, retention and succession plans are in place. Plans are supported by training programmes, with periodic review to meet objectives and applicable legal or other requirements.			
E3.2.1 Induction program	The induction program should be tiered to visitors, new employees, new-to-site joining crew and returning crew where changes have occurred. A brief induction program should be in place for visitors and new joining crew members, which includes a tour of the site (e.g. vessel or camp). All personnel arriving to work on site should receive an in-depth site induction within 24 hours of arrival and before starting hazardous work on the crew. This should include, but not limited to information on: • HSE policies • Hazard and risk awareness • Job descriptions and responsibilities • Behavioural safety • Work instructions • Basic survival • Emergency procedures • Hazard and incident reporting • Security behaviours • Respect for local communities • Contract specific HSE or regulatory requirements. Individual orientation records should be maintained.		S5 S6 M3

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E3.2.2 HSE training	Training programmes should be designed to cover the requirements described within each module of the reference and be delivered by competent trainers. Training programmes should provide the essential knowledge to comply with permit and regulatory requirements. Training requirements should be listed for each individual role. The HSE training matrix should cover the range of roles in the company, the course levels, HSE critical activities, the refresher courses and the re-training periods. A current list of personnel who have completed training requirement should be maintained. Gaps should be documented and closed out.		M2 M3
E3.2.3 Training for HSE support	When the client and contractor agree the need for crew HSE support, the competence requirements stated in the reference and local legal requirements should be met.		M3
E3.2.4 Recruitment	Recruitment programs should comply with local employment regulations. Additional considerations should include: • Transparency in advertising for personnel (non-discriminatory hiring) • Equitable employment practices • Clear description of: – Job Title – Position purpose and duties – Qualifications desired (education level, driver's license, specialized training) – Experience level expected – Medical fitness level required • Clear description of the project area and the nature of the work – Location of the work, rotation schedule and working language – Duration of the position (full, part, permanent, temporary) – Hours of work, salary and conditions – What employees should bring with them, what the employer should provide • Interview panel • Selection process.		M11 SR1
E3.2.5 Retention and succession planning	Contractor should have a process in place for managing retention and succession planning, including local content.		
E3.3 – A competence assurance process exists to screen, select, train and conduct ongoing assessment of the qualifications, fitness-for-task, enabling behaviours, and supervisory needs and abilities of the workforce to meet specified job requirements.			
E3.3.1 Competence management and verification requirements	Competence and verification requirements should be covered in documented records including: • Job identification • Job specific competencies (see reference) • Job specific competent personnel • A process for periodic review of defined competencies should be in place. This includes trade skills (e.g. electricians, drivers, etc.) corresponding to the specific roles in addition to the HSE competencies (knowledge, understanding, skills and behaviours) required to carry out the job in compliance with the contractual HSE requirements and to the required certification(s) granted by the recognized authorities.		M3
E3.3.2 Training and competence of risk assessors	The competence of those assessing risks should meet the standard in the reference.		M3 M10

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E3.3.3 Short service employees (SSE)	A short service employee program should be in place including, but not limited to: • Definition of an SSE (e.g. less than 6 months in the industry, with the employer or in the position) • Maintain a list of SSEs and statistics • A procedure for managing SSEs.		
E3.4 - There is a system to allocate appropriate and sufficient internal and external resources to meet business objectives. The system includes development and management of the supply chain to take into account local content and indirect impacts.			
E3.4.1 Resource allocation	Consider security and social responsibility aspects for hiring local personnel taking into account national and local content obligations. Develop a social responsibility plan where applicable. Ensure that all aspects of HSE are appropriately considered and weighted in tender development and evaluation.		M2 SR2
E3.5 - The organization has mechanisms and programmes for joint participation and management consultation within the workforce. This supports involvement in areas including planning, continuous improvement and management of change (MoC).			
E3.5.1 Operational and project meetings (before and after execution phase)	Meeting types should include: • Kick-off meeting after contract signing to lay ground work for detailed project planning during pre-mobilization phase • Start-up meeting at mobilization phase to review the approved Project HSE Plan, risk assessment, any other specific plans and procedures • Project meetings to be held at crew and project supervision levels with interactions between the responsible parties • Close out meeting at end of project to gather all lessons learned for integration into future projects.		
E3.5.2 HSE meeting programme (during execution phase)	An effective hierarchy of HSE committees and meetings is defined and implemented, which should include but not be limited to: • HSE committee meetings to be held at planned intervals • Regular HSE meetings for work units and skill pools (survey, drilling, vehicle and boat drivers, etc.) • Regular toolbox meetings • Actions arising from meetings are communicated and tracked and records of meeting attendance kept, where required.		M2 M3
E3.6 – Where external resources are deployed, processes are in place to: • **evaluate, select and perform assurance of purchased goods and services to ensure defined specifications, requirements and acceptance criteria are met** • **define the level of monitoring and quality assurance/control based on the supplier and contractor capability and risk of contracted activities, services or supplied goods** • **ensure risks associated with activities carried out on behalf of, or in partnership with, the company are properly managed** • **evaluate performance and provide feedback.**			
E3.6.1 Contractor management process	Client and contractor should both have a contractor management process in place which defines the contracting process, including: • Planning • Sourcing/Capability assessment • Tender and Award • Pre-mobilization • Mobilization • Execution • De-mobilization • Final evaluation and close-out.		M2 M11

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E3.6.2 Ensuring HSE performance is part of contract requirements	Contract requirements should be defined to meet HSE performance objectives as well as those of time, cost and quality. • HSE objectives should be realistic and consistent • Focal points within the crew structure should be designated the responsible persons for ensuring that all HSE matters have been identified for the contract • Contractor should ensure that diligence is being paid to the fulfilment of the contractual HSE specifications • Relevant aspects of social responsibility such as those included in the Universal Declaration of Human Rights.		M2 SR1 M17
E3.6.3 Subcontractor involvement	Subcontractors management should be covered in HSE-MS, including but not limited to: • Subcontractors capability assessment process in place • The same expectations as the lead contractor • Subcontractors are part of the communication process • Subcontractors are included in training programmes • HSE performance of subcontractors is monitored – objectives given, metrics agreed and tracked.		M1 S5 S6 M2 M11
E3.6.4 Contractor HSE standards	Contractor should inform client (and subcontractor should inform contractor) as to its standards for HSE, equipment design, operational and maintenance and obtain agreement on their use during the performance of the project. Contractor should formally inform client of any deviation from client HSE requirements, which should not jeopardize the overall HSE performance.		
E3.6.5 Client/contractor/ subcontractor interfaces	Client/contractor/subcontractors should develop and document any required interfaces within the Project HSE Plan or in a separate bridging document. In marine, where the vessel operator can be a subcontractor of the seismic contractor, a bridging document should exist linking the vessel's ISM to the Crew HSE-MS. Contractor should also address other subcontractor interfaces. Particular attention should be paid to activities in which three or more companies are involved.		M8 M2 M2-03 M15
Element 4 – Stakeholders and customers			
E4.1 – Stakeholders, including local communities, are identified and relationships established as an integral part of sustaining a responsible business presence throughout an activity's life cycle.			
E4.1.1 Stakeholder engagement process	Establish, when appropriate, a stakeholder engagement plan, possibly including a social impact assessment, which should usually be a client led activity. Consider opportunities for engaging local content, community business and avoiding conflicts and disputes with the local communities.		E11 E13 M11 SR2 SR5 SR6 SR7 SR8
E4.1.2 Stakeholder interfaces	Where appropriate, it may be necessary to interface also with some stakeholders who are not a contracted entity. This should be linked with the stakeholder engagement plan, and include categories such as notification and grievance procedures.		SR3 SR4

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E4.2 – Processes are in place to assess, manage and engage with customers and other stakeholders regarding life cycle risks and opportunities associated with the company's products, assets and activities. This includes compliance with regulatory requirements.			
E4.2.1 Regulatory compliance matrix	Identify and develop a regulatory compliance matrix of relevant laws and regulations for the project.		
E4.2.2 Obtaining permits and authorizations	All licences, permits and authorizations required for the performance of the project should be obtained.		
E4.3 – Mechanisms exist to document, evaluate and address stakeholder and customer expectations and feedback, including concerns and grievances.			
E4.3.1 Stakeholder mechanisms	Where appropriate, maintain a stakeholder engagement log and commitments register. Publish appropriate contact information for queries, grievances or emergencies. Establish a dispute resolution process before a project commences.		SR3 SR4
E4.4 – Positive relationships are established with stakeholders and customers. There should be active two-way communication and engagement, seeking feedback on performance and responsiveness to their needs at any point in the value chain, including appropriate emergency response.			
E4.4.1 Community engagement	Where appropriate, hold meetings for local communities on key issues, before commencement and before conflicts develop. Both client and contractor may need to utilize community liaison officers.		M11
Element 5 – Risk assessment and control			
E5.1 – Processes and methods to manage risks to an acceptable level are in place to: • **establish operational, environmental and societal context; develop baseline information; and engage stakeholders before, and as input to, risk assessments** • **identify and document hazards, effects, impacts, threats and other vulnerabilities, and to assess the associated risks to determine significant risks** • **implement effective controls / barriers to eliminate or reduce risks** • **establish effective controls/barriers to prevent escalation, mitigate consequences and facilitate recovery.**			
E5.1.1 Risk management process (for generic and project specific hazards)	Assessment should be carried out for all aspects of HSE (and its broader definition) including: • The generic risks associated with the crew that can be independent of project or client • The project specific risks related to actual project and client/contractor relationship (e.g. risks related to country, new technology, operations, etc.). Assessment process should include: • Hazard identification • Assessing and ranking the risks • Identification of control and mitigation measures • Communicating to the crew. Process should be based on a risk matrix such as provided in reference.		M12
E5.1.2 Joint risk assessment	Once the contract has been awarded, a joint risk assessment should be performed.		
E5.1.3 Pre-task planning	Work should not be conducted without a pre-task risk assessment (e.g. Job Safety Analysis – JSA) and a safety discussion, (e.g. toolbox meeting) appropriate to the level of risk.		
E5.1.4 Simultaneous Operations (SIMOPS)	Simultaneous Operations (SIMOPS) process should be in place, documented and communicated. Accountabilities and responsibilities for managing SIMOPS should be defined between client and contractor.		M2 M16

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E5.2 – Document and communicate the risk management processes for significant risks, including risk acceptance approval at appropriate levels of the organization, scheduled reviews and updating of risk registers.			
E5.2.1 Risk reduction/control measures	An effective process for risk reduction measures should be defined using the following hierarchy: • Safety by design • Elimination • Substitution • Engineering controls • Work practices • Administrative controls • PPE. Responsible parties should be assigned to implement and maintain the controls. Risk reduction measures should be evaluated for unintended harmful consequences. The tolerability of escalation factors (e.g. visibility, weather, temperature, sea state, etc.) should be evaluated and documented in the Matrix of Permitted Operations (MoPO). Permit to Work (PTW) and Lock-out/Tag-out (LOTO) should be in place as control measures, where appropriate. For the environmental mitigation hierarchy see the specific reference.		M7 M18 SR9 S18
E5.2.2 Risk review and approval	Establish a review process for risk assessments and registers. Approvers should be defined for different levels of residual risk. Client and contractor should regularly review the project HSE risk assessments, e.g. at mobilization, crew changes and close-out meetings.		
E5.3 – Temporary/permanent changes that affect the organization, activities, assets, operations, products, plans or procedures are subject to a formal, risk-based MoC process, with approved timeframes and actions that are reviewed and tracked to completion.			
E5.3.1 Management of Change (MoC)	The application of a management of change procedure is required when defined change occurs or is proposed. This includes changes in the agreed Crew HSE Plan, Project HSE Plan, bridging document or contract. Any HSE critical work impacted or caused by temporary and permanent changes to any of the following, cannot proceed unless an MoC process is completed: • Organization • Personnel • Systems • Process • Procedures • Equipment • Products • Materials or substances • Laws and regulations.		M1

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E5.3.2 MoC process	The MoC process should include: • Development of a work plan that clearly specifies the timescale for the change and any control measures to be implemented regarding: – Equipment, facilities and process – Operations, maintenance, inspection procedures – Training, personnel and communication – Documentation. • A risk assessment conducted by those responsible for the change, involving those impacted by the change • In the event that a residual risk is not acceptable, the work plan should be revised • Specialist advice should be sought during the consideration of the change, where appropriate • Authorization of the work plan by the responsible person(s) through completion • Circulation of the change to the appropriate personnel with an explanation of how the change should be implemented • Implementation review to see if any unintended consequences or changes to risk • Client should be involved in any project related MoC • A process of close out including recording any lessons learnt from the MoC effectiveness.		M1
E5.3.3 MoC process – Temporary change	Where a temporary change has been applied: • There should be verification that the change has reverted within the specified time frame, or an extension approved.		M1
E5.4 – Maintain a culture of risk awareness to ensure vulnerabilities and non-conformances are recognised, including deviations from operating procedures or weak signals that provide indications of potentially increasing risk.			
E5.4.1 Field leadership	Crew manager and supervisors should receive suitable training in risk management and investigation. Field leadership to continuously reinforce the risk awareness and risk management efforts. Promote a culture of mindfulness in the organization, through experienced and committed leadership.		M3 M13
E5.4.2 Monitoring performance	Monitoring program should include reporting and assessment of unsafe acts and conditions, non-conformances, and other health, safety, security, environmental and social responsibility events (e.g. KPIs).		
E5.4.3 Culture assessment	Consider using safety culture assessment tools, where appropriate.		

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
Element 6 – Asset design and integrity			
Note: The Geophysical Industry does not operate hydrocarbon drilling, production, bulk transport or processing facilities and its profile on major risks is much lower than that of such facilities or assets in terms of fire, explosion or potential hydrocarbon spill volumes. Assets used in Geophysical operations are: • Vessels including their Geophysical equipment • Vehicles and special vehicles such as shot hole drilling rigs, vibrators or bulldozers • Small craft, barges, houseboats • Helicopter and fixed wing aircraft • Camps, warehouses/workshops, offices • Recording equipment • Other tools and equipment for performing the work or related repair or maintenance. Table 2 provides adequate and detailed guidance on the industrial risks, selection/design, equipment fit, inspection, preventive maintenance and operation procedures specific for these assets.			
E6.1 – Baseline information and results of risk assessments are used as input to location, design or selection decisions.			
E6.2 – Criteria, specifications and standards for the design, construction / selection, commissioning, modification and decommissioning of assets and their associated facilities, equipment and materials are defined to address risks and verify conformance throughout their lifecycle.			
E6.3 – Establish and maintain procedures to ensure assets, facilities and/or equipment are operated within defined design and operating limits at all times. Communicate this to staff that operate, maintain, inspect and manage them.			
E6.3.1 Operating limits	Operating limits should be defined and documented in a Matrix of Permitted Operations (MoPO) or other instructions. Typical examples include: • Weather and sea state limits • Visibility limits, VFR/IFR • Night time operations • Maximum number of people on board, in a vehicle or in a camp • Load limits • Speed limits • Water depth limits.		
E6.4 – Processes are in place to identify and manage critical risk controls/ barriers to prevent a major incident.			
E6.4.1 Management of barriers and controls	Establish a process to systematically (over a defined period) verify that key controls and barriers (e.g. physical, procedural, etc.) for higher risk activities are in place and effective. Process should verify that barriers and controls are not being circumvented. Develop verification KPI (e.g. % completed as per plan). For marine operations, barriers and controls should include: • Vessels' FMEA as per the class • Back deck FMECA at design stage • Vessel's safe power threshold limit to prevent streamers tangle, otherwise agree contractually on a reduced streamer configuration • Collision risk management.		M2

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E6.5 – There are processes to maintain, replace, test, inspect, calibrate, certify and verify performance of assets, facilities and equipment. These activities are performed at frequencies appropriate to the level of risk, and deviations from specified criteria are managed.			
E6.5.1 Equipment and inspection (including HSE equipment)	An inventory of all equipment should be developed and maintained. Equipment is subject to a regular inspection schedule. HSE equipment includes PPE. Responsibility for the cost, provision, storage and maintenance of HSE equipment should be agreed. Maintain a list of minimum spare parts for HSE critical equipment that is available on site.		M1 M2 S5 S7 Manufacturers' recommendations
E6.5.2 Inspection and preventive maintenance	An inspection, testing and preventive maintenance system should be in place defining schedules, procedures, responsibilities and competencies which should include but not be limited to: • inventory planning to include additional units to allow rolling stand-downs for maintenance as appropriate • go/no go directives from management for units overdue for servicing • documentation that HSE critical equipment has been checked and tested by a competent person prior to being put into service • documented schedules and procedures for servicing of each unit as per manufacturers guidelines • documented schedules for testing, calibration and re-certification of equipment where applicable • Valid inspection reports and certificates should be available where applicable.		Table 2
E6.5.3 Record keeping	Contractor should keep detailed records of inspections, testing, preventive maintenance and certification (as applicable) of assets including but not limited to: • Inspection, test or service record sheets to be completed with each service, signed off by the responsible person, and filed, to include: – Unit identification – Work done and by whom – Date – Total km/miles/operating hours on unit where applicable.		
E6.6 – Due diligence is applied when assets are acquired or divested.			
E6.6.1 Due diligence	HSE in its broadest sense is taken into account and risk assessment performed when assets are acquired or divested.		
E6.6.2 Equipment purchase/rental requirement	Contractor and subcontractor(s) should include in the contract for purchasing or renting equipment, the requirement for any FME(C)A, certification, manufacturer manuals, trials, etc.		

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
Element 7 – Plans and procedures			
E7.1 – Plans and procedures are established, documented and maintained in accordance with identified legal and other requirements in line with the risk level defined by the organization and the required risk controls.			
E7.1.1 Planning at the project level for achieving HSE objectives	Planning is in place, which includes but is not limited to: • Clear objectives set • Means to achieve the objectives • Project planning tools to show milestone status • Remedial action tracker, kept up to date • Resource requirements are defined • HSE motivation programmes • Performance feedback methods.		M1 S5
E7.1.2 Crew/project HSE Plan	Contractor should document Crew and/or Project HSE Plan in line with the reference and this document. Final HSE Plan content should be agreed by client and contractor.		M2
E7.1.3 Basic site specific HSE rules applicable to all personnel are available	A set of basic HSE rules that are applicable to all persons on the crew should be documented. Rules should cover health, safety, security, environment and community interaction. When applicable, other rules of conduct should be documented to ensure compliance with local regulatory requirements. In lieu of using client or contractor HSE rules the IOGP Life-saving rules are available for use.		M2 S26
E7.1.4 Procedures for high risk activities	Contractor should develop procedures for high risk activities. Control of work processes should exist such as PTW, LOTO and MOPO.		S4 M3 S5 Table 2
E7.1.5 Project specific procedures	Project specific procedures and/or work instructions should be developed when existing documents are insufficient, e.g. emergency towing, coming alongside, personnel transfer, etc.		
E7.2 – Plans and procedures, including revisions, are subject to approval at an appropriate level of authority.			
E7.2.1 Authority level for approval	The document control procedure specifies the appropriate subject matter expert for review and the appropriate level of authority for approval.		
E7.3 – Plans and procedures are supported by guidance and training as appropriate to enable effective implementation by competent resources.			
E7.3.1 HSE procedures for specialist and HSE critical jobs	All specialist and HSE critical jobs that require formal procedures (e.g. require PTW or LOTO) or work instructions have been identified and documented. Identify HSE critical tasks in the job descriptions of people in these jobs. Simultaneous operations should be identified and consideration given to their compatibility. • When work is dependent on, or affects another activity, its planning, scheduling and implementation should be coordinated and priorities of execution defined. • A competent person as a prerequisite for conducting the risk assessment should inspect the work site. Where warranted for offshore operations, a diving procedure should be in place.		S23 S25 M16
E7.4 – Processes are in place to ensure the latest version of an approved plan or procedure is available at point of use.			
E7.4.1 Revision of procedures, work instructions and HSE rules	A procedure should be in place for: • Periodic revision • Involving users in the revision • Reviewing associated risk assessment confirming risk level is ALARP and acceptable • Disseminating updates.		

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E7.4.2 Document version	A document control procedure and process should be in place, which includes version number and issue date.		
E7.4.3 Document access	Corporate, project and site plans and procedures should be accessible to all contractor personnel. Where possible from a central web-based point.		
E7.5 – Contingency, emergency, crisis and continuity management plans, as well as required resources, are in place with regular tests and drills, including incorporation of lessons learned.			
E7.5.1 Development of emergency plans and procedures	An overall project specific emergency plan should be developed by contractor/client/subcontractor covering all relevant emergency scenarios, listing procedures to be followed and resources to be available in the case of emergency. The plan should cover but not necessarily be limited to: • procedures • organization • interfaces between client and contractor emergency levels and subsequent actions • responsibilities including any external support, liaisons and authority representatives • communication flow • links to emergency services, communities, officials and other stakeholders. Where appropriate these should include: • clear guidelines on who takes primacy depending on the level of initial incident and subsequent escalation • agreement on who is authorized to communicate with the media • agreement on communications with relatives. Plans and procedures should be tested to ensure they work and regular trials held to train people in emergency response.		M1 M2 M3 S5 S6
E7.5.2 Crisis management (CM)	Client/contractor/subcontractor should: • Define specific responsibilities in case of crisis • Ensure each has an appropriate business continuity plan • Ensure each has a policy regarding staff usage of social media. Client/contractors and subcontractors should set up an Emergency/ Crisis Management room and an organization to ensure that sufficient appropriately trained personnel and suitable equipment necessary for dealing with emergency and crisis situations are constantly on call. They should be tasked with: • Defining and coordinating the actions required for dealing with emergency/crisis situations and their consequences • Supporting the site's emergency/crisis response, according to the project-specific emergency response plan (ERP).		M3
E7.5.3 Corporate level communication facilities and procedures	A CM procedure should be in place which addresses strategic response (upper management), operational response (management) and tactical response (field management) with training and competency requirements as per the reference. Procedure should include provision of a corporate level CM communication facility, which provides 24 hour per day coverage during a crisis. Frequent drills and exercises are undertaken. Communication centres should maintain a log of work unit movements and status.		S5 S6 M3

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
Element 8 – Execution of activities			
E8.1 – Processes are in place to prepare for activities and ensure operational readiness and integrity of systems before commencing work, and to confirm interfaces/handovers are established.			
E8.1.1 Operational readiness	Contractor should verify that competencies of the HSE critical roles are in line with the requirements and risks of the job, and the training is current. Operational readiness activities include: • Mobilization and de-mobilization plan (could be port call plan) • Readiness review(s) • Pre-start-up audits and inspections. Agree a definition of what operationally ready means and what approval is needed.		
E8.1.2 Handovers	Crew rotation and shift change handovers should be scheduled and documented, as a minimum for HSE critical roles. Handover notes should be peer reviewed for these key positions.		
E8.2 – When work is underway, processes are consistently applied to ensure activities and tasks are executed as prepared.			
E8.2.1 Toolbox meetings	Contractor should have a process in place for performing toolbox meetings, Job Safety Analyses (JSA) or other appropriate methods of risk assessment: • Daily toolbox meetings for work units and skill pools should be held before starting work (survey, line opening, drilling, drivers, etc.) • Toolbox meetings for routine jobs should be based on operating procedures • New jobs should be risk assessed using a JSA; topics should be consistent with the daily activities and linked to control measures such as Permit to Work, work instructions and risk assessments prepared for the expected activity, and any other relevant documentation • For any **non-routine** operation, a risk assessment should be held prior to the toolbox meeting.		M2
E8.2.2 Last minute risk assessments	Supervisors should ensure the use of last minute risk assessments with members of their team.		
E8.3 – Suitable and sufficient supervision exists to confirm each activity and/or task is executed in compliance with the plans and procedures and delivers the expected outcome.			
E8.3.1 Management supervision	Crew/town/country-based managers/supervisors make regular visits to all operational work areas and sites. Management site visit schedule should exist. Visits should include an assessment of the effectiveness of the risk management controls and barriers in place. Management should be briefed on the project specific plans, procedures and risk profile.		M13
E8.3.2 Site supervision	The number of site supervisors is based on local constraints and the risks inherent in the project. Site supervisors should conduct regular assessment of plans and procedures for improvement. Supervisors to walk the floor regularly. Regular inspection schedule including risk verification plan should be utilized.		
E8.4 – A culture is maintained whereby everyone understands their responsibility to 'Stop and Intervene' during an activity when a risk is not adequately controlled.			
E8.4.1 Stop work culture	Induction program covers obligation and authority to stop unsafe work and intervene. Management should provide a positive example through support, encouragement and recognition. Setting KPI for interventions and monitoring the KPI.		M13 M14

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E8.4.2 Behavioural observations and intervention	Contractor should implement an observation and intervention programme and all employees should be encouraged to participate. In addition to spontaneous observations, planned and structured observations should be promoted to enhance the intervention culture.		
E8.5 – Feedback on performance and behaviour is sought and acted upon. Good performance and positive behaviours are recognised, reinforced and rewarded. Processes should be in place to manage inadequate performance or unacceptable behaviour.			
E8.5.1 Suggestions for improvement	A system should be in place to allow the workforce and others to make and receive feedback to suggestions on HSE matters, including feedback from internal and external reviews. Contractor's managers and supervisors should report back to the workforce on the actions taken from the suggestions. Implemented changes should be documented and monitored for sharing and continuous improvement.		M13 M14
E8.5.2 HSE promotion and awareness	Management regularly communicates on HSE to increase awareness: • Successes and failures are openly communicated to all employees • Suggestions are recognized and acted on in a timely manner • Systems are in place to recognize, reward and encourage success • Participate in and promote industry sharing of lessons learnt, e.g. safety flashes or alerts • Has a system to continually improve behaviour through observation, intervention, recording and coaching. These activities should be tied into the overall vision and strategy for the execution of the project/activity so the workforce can draw a clear link back to the overall goals.		M2
E8.5.3 Influencing behaviour	Managers and supervisors should encourage a positive safety culture. Contractor should have programs that can identify and reduce risks associated with fatigue and stress. Managers and supervisors should be prepared to identify and recognize individuals who have demonstrated safe behaviour. Local customs should be understood and respected. Managers should also recognize collective behaviour as this encourages collaboration and team ownership of safety issues.		M9 H6 H7
E8.5.4 Behaviour policies and training	Contractor should have policies that state zero tolerance for violence (verbal and otherwise), harassment and substance abuse. Harassment Policy should be included as part of basic awareness training.		M3
E8.5.5 Managing unacceptable behaviour	Unacceptable behaviour should be assessed as being unintentional or intentional. Investigating and understanding the root causes for unacceptable behaviour may lead to a review of training programs, a revision of operating procedures, analysis of the work environment, consideration of the local and organizational culture, technology, etc. For intentional unacceptable behaviour, a range of sanctions may be applied depending on the seriousness of the consequence of the behaviour and the contractor's disciplinary policy.		M14
E8.5.6 Incentive schemes	Client and contractor should consider the implementation of an incentive scheme to reward individual and peer positive behaviours. Individual reward should be based on recognised positive behaviours. Team rewards should be based on collective achievement towards leading KPIs set in the Project HSE Plan.		M1 M2 M3

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
Element 9 – Monitoring, reporting and learning			
E9.1 – Processes are in place to monitor, measure, verify, validate and record characteristics of operations and products to ensure implementation and compliance with the HSE-MS and achievement of its objectives.			
E9.1.1 Monitoring and reporting of corporate and project HSE performance	Monitoring is in place to ensure compliance with the contractual HSE requirements, including Project HSE plan, any other supporting plans, bridging document, etc. Regular HSE performance reporting should be implemented: • performance is tracked against the set objectives • corrective actions are developed for under-performance • accurate records of HSE data should be maintained.		M1 M2 M3 H10 S28
E9.1.2 Self-assessments, inspections and verification	Each work unit, site or operational entity should have inspection schedules which are used regularly. Regular systematic HSE inspections should be performed by the Contractor/Subcontractor site management to verify that risk management barriers and controls are being effective, according to a pre-agreed verification plan. Client should monitor the verification process according to the monitoring plan.		
E9.2 – Incidents, events and non-conformances (with actual and/or potential consequences) are reported, recorded and classified to defined criteria, and investigated to determine direct and underlying causes.			
E9.2.1 Incidents to be investigated	All incidents and near misses should be promptly reported and investigated. The level and effort of investigation should be adjusted to reflect the significance or potential of the incident and to be agreed by client and contractor.		M1
E9.2.2 The investigation and reporting team	Procedures in the Project HSE Plan and/or bridging document should define the trigger points for initiating an investigation under both the client and contractor's HSE-MS. Composition and competencies of the investigation team (client/contractor balance) along with a planned mobilization time should be stipulated for the different level of incidents. In the case of a fatality or an incident which significantly affects the environment or a company's reputation, a senior manager should be part of the investigation team.		M1 M2 M3
E9.2.3 Actions to be taken immediately after an incident	Information should be gathered before it is lost. This includes but is not limited to: • isolate the incident scene where possible • isolate parts, tools or equipment involved in the incident • check gear, switch positions, fluid levels, and safety devices of any equipment involved in the Incident • keep and label all broken parts, etc. • take pictures and/or sketches/measurements of evidence that may be destroyed by weather, or may need to be moved • identify witnesses and obtain statements • perform substance abuse tests where appropriate • comply with regulatory requirements.		

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
E9.2.4 Actions to be taken by investigating team after assembly at site.	Incident investigation procedure should include but is not limited to the following: • Establish Terms of Reference including allocation of responsibilities to the team • Gathering of information through witness statements, witness interviews, police or other authorities' reports, expert advice and records, e.g. of maintenance, procedures, previous incidents, training and JSA's • Examination of parts, equipment, tools • Analysis of photographs, sketches, measurements, re-visit Incident scene • Development of the sequence of events • Determination and prioritization of the contributing factors and root causes (root cause analysis) • Determining and listing corrective actions and/or recommendations with named action parties and defined completion dates • Naming of action parties and date for close out.		M1
E9.3 – Processes exist to: • **learn from incidents, events and non-conformances from both internal and external sources** • **benefit from learning opportunities and good practices within the organization, the oil and gas industry, and from other public sources** • **implement appropriate remedial actions (with application of MoC as appropriate) to address event causes, strengthen risk controls/barriers and prevent recurrence** • **verify closure of actions or plans.**			
E9.3.1 Lateral learning from incidents	Investigation reports should be issued promptly, and include identification of what was learned and critical information that requires dissemination. Contributing factors and root causes should be included. The HSE-MS should include a formal system whereby lessons learnt from incident investigations are communicated throughout the organization, and should be shared with the industry (e.g. via IAGC Safety Alerts). Process should require use of these lessons in planning future operations or risk assessments. Learnings should be incorporated in the appropriate work instructions, and into subsequent risk assessment(s).		
E9.3.2 Follow up of incidents	An appointed person should verify effective close out or implementation of entire set of corrective actions and/or recommendations from incident investigation.		M1
E9.4 – Processes define and establish leading and lagging key performance indicators (KPIs) using measures designed to improve performance and behaviours. KPIs are regularly reviewed to ensure they provide meaningful information.			
E9.5 – Monitored and reported data is reviewed to ensure quality in terms of consistency, accuracy and completeness.			
E9.4.1 KPI reporting and monitoring	The reporting system should have the ability to track leading and lagging KPIs. Project specific KPIs should be established as part of the contract and set in the Project HSE Plan. Client / Contractor / Subcontractor site management should review performance on a regular basis (e.g. crew HSE committee meetings), recognize successes and define opportunities for improvement. Hold client/contractor performance review meetings at the end of project, and at agreed intervals.		

Item number and title	Minimum expectation for the HSE-MS	Alternative or exception	References
Element 10 – Assurance, review and improvement			
E10.1 – A documented, risk-based assurance process, including scheduled independent audits, is established. It evaluates conformance with Expectations; organizational capability; effectiveness of the HSE-MS in meeting objectives, stakeholder and business needs; and also identify areas for improvement.			
E10.1.1 Audit process and plan	Contractor should have an internal HSE audit process that covers the entire scope of its operations including activities managed by subcontractors in line with the reference. An audit plan should be in place. Additional audits may be conducted or requested by client.		M4
E10.1.2 Audit scope	The audit scope should clearly state the terms of reference, which could include at least the following: • standards • rules • regulations • work instructions, procedures, guidelines • criteria against which the audit findings should be assessed.		
E10.1.3 Audit team	Competence of the audit team: • familiarity with audit techniques • the audit leader should be qualified to lead an audit • the audit team should include an appropriate combination of knowledge, skills, understanding, personal qualities and experience to carry out their responsibilities to fulfil the scope of the audit.		
E10.1.4 Independence	The team should be objective and free from conflict of interest, although it may include representative(s) from the activity to be audited.		
E10.1.5 Close-out and corrective actions	The final audit report and findings should be delivered in a timely fashion. The auditee is responsible for corrective action plans and status reports. Corrective actions should be entered in an action tracking system.		
E10.2 – Consolidated and interpreted performance information is prepared for management review, internal and external benchmarking and stakeholder communications.			
E10.2.1 Benchmarking	Periodic performance reporting at agreed frequencies, such as annual HSE statistics reporting to the IAGC.		
E10.3 – Data and performance KPIs are assessed to understand risk control/ barrier weaknesses and identify opportunities for improvement.			
E10.4 – Improvements based on assurance findings, lessons learned, and internal and external good practices are planned, communicated and embedded within the HSE-MS to drive continuous improvement.			
E10.4.1 Lessons learned	A rigorous process should be established for capturing and utilizing lessons learned to improve both corporate and crew HSE-MS. Sharing appropriate HSE lessons learned at industry fora.		
E10.5 – Managers formally review the effectiveness and fitness-for-purpose of the HSE-MS. Identified improvement actions are planned and communicated, with implementation tracked to completion.			
E10.5.1 Management review of Contractor HSE-MS	Contractor management should review their HSE-MS at regular intervals (at least annually) to ensure its continuing suitability and effectiveness with regards to all their activities. The review should: • assess corporate HSE performance; • address possible needs for changes in policy, objectives or other system elements in light of audit results and changing circumstances, experience and commitment to continuous improvement • consider changes in legislation • consider changes in key personnel endorsing policies.		
E10.5.2 Communication of improvements	The contractor and client should provide to each other any HSE-MS revisions or amendments issued during the term of the contract.		

Table 2: Minimum expectations for the control of specific risk areas

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.1 Safety critical equipment & activities			
2.1.1 Equipment Inventory	An inventory of all equipment, portable appliances, machinery and plants that require regular preventative maintenance should be available and regularly updated, e.g.: • Vehicles of all types • Vessels • In water equipment • Small boats, engines • Generators • Trailers • Fire detection and control equipment • Medical equipment • Air conditioners/heaters • Cranes, winches, hoists, rigging • Workshop equipment (e.g. welding sets) • Compressors • Water pumps • Chainsaw • Drill units • Water and waste treatment plants • Aircraft and helicopters • Aircraft and helicopter cargo equipment, internal and external • Elevators. Inventory to include unique identification numbers of all units.		GENERAL S5 S6 E5
2.1.2 Permit To Work (PTW)	A PTW system should be in place. PTWs should be authorized, monitored and re-validated by the responsible senior crew member. A log book of PTW forms issued should be maintained and archived for a minimum of twelve months. PTW should be used for the following safety critical activities: • Hot work (outside designated areas) • Working at Height • Confined Space Entry • Work on stored energy systems (i.e. electrical, high pressure air, hydraulics and mechanical) • Diving • Excavation • SIMOPS (Simultaneous Operations) • Non-routine operations with significant risk, e.g. non-routine lifting • Operating Hull penetrating equipment • Other potentially hazardous tasks. PTW should define the scope of work, tasks required, its location, when the permit expires, and indicate that no other work is authorized under that permit. PTW should identify the hazards and risks associated with the work, establishing control measures to eliminate or reduce risk and measures required to return to normal operations. PTW should identify LOTO (Lock out – tag out) and energy isolation requirements related to the task.		GENERAL M3 S4 S5 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
	PTW should only be issued following a pre-job workplace inspection to confirm the required control measures are in place, conditions have not changed, and any new potential hazards have been risk assessed and managed. Energy isolations should not be removed before all related permits have been signed off as complete. PTW should not extend across shift changes. Before a PTW is closed, the workplace should be inspected and re-activation of all disabled systems confirmed and if necessary, tested. PTW activities should not be performed by a lone worker. Routine jobs that are not controlled using a PTW system should be risk assessed and be covered by a procedure if necessary.		
2.1.3 Energy Isolation	Any isolation of energy systems; mechanical, electrical, process, hydraulic, pneumatic and others, cannot proceed unless: • The method of isolation, discharge and reinstatement of stored energy (including possible multiple paths) are agreed and executed by a competent person(s) • Where possible, stored energy is discharged and its absence confirmed (zero energy state) • A system of locks and tags (LOTO) is utilized at isolation points • A test is conducted before any related work begins to confirm the isolation is effective • The isolation is periodically monitored for effectiveness • There is a process to communicate the status of isolations between shifts and different workgroups.		GENERAL S5 S6
2.1.4 Lock out/Tag out (LOTO)	A LOTO procedure should include but not limited to the requirements to: • Identify all parts to be shut down • Advise all personnel involved • Identify authorized and competent person to apply LOTO • Identify all power sources • Utilize unique locking devices • Tag out all locking devices recording 'who', 'when' and 'why' • Removal of LOTO on completion.		GENERAL S4 S5 S6 M3
2.1.5 Working at heights or aloft	Work at height or aloft is any work in any place where a person could fall a distance liable to cause personal injury. Specific height limits will vary by jurisdiction. The following activities require controls: • Working in a location where there is exposure to a fall from height • Routine and occasional access and egress to a location at height • Where a fall from any height would be into a hostile environment (such as water). These activities cannot proceed unless the most appropriate and practical controls below are met: • A fixed platform is used with guard or hand rails, verified by a competent person • Use of short lanyards to prevent or limit falls • Fall arrest system that ensures 100% tie-off at all times is used that has: – A proper anchor mounted overhead – Full body harness using double latch self-locking snap hooks at each connection – Synthetic fibre lanyards – Where appropriate, double lanyards, and/or shock absorbers		GENERAL S5 S6 M3 S26 S50

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
	• Fall arrest equipment should limit free fall to less than 1.8 metres (6 feet) • A visual inspection of the fall arrest equipment and system is completed prior to each use and any equipment that is damaged or has been activated is taken out of service • Person(s) are competent to perform the work • A controlled access zones procedure is in place where conventional fall protection methods cannot be used • There should be a procedure in place to rescue from height, including trained personnel and necessary equipment. All personnel should be made aware of the dangers of jumping. The above should be captured in the working at height procedure and task specific rescue should be addressed in the PTW. A Dropped Objects Prevention Scheme (DROPS) process should be in place to prevent tools and equipment from being dropped onto personnel or equipment below.		
2.1.6 Edge protection	Edge protection (barrier to falling) should be installed where there is a risk of falling to a lower level or hostile environment such as water. Edge protection can be permanent or temporary.		GENERAL M10
2.1.7 Ladders and scaffolding	Any work conducted from ladders or scaffolding is considered working at height and should be authorized and controlled. Compliance with regulations, guidelines, requirements and practices in the reference document: • Designed to support load • Buddy system • Isolated ladder for electrical work • Safety feet and rubber tips for extension and straight ladders • Step ladders not to be used as straight ladders • Personal protective equipment (PPE) • Tool belts or pouches. Special construction ladders designed for specific purposes may be used if properly maintained and used according to manufacturers' instructions (e.g. aircraft maintenance access step ladder). Safety harnesses should be worn for scaffolding erection/dismantling operations. Scaffolding should be inspected, approved and tagged by a certified competent individual prior to use, after any alteration or on a regular basis if no alteration occurred.		GENERAL Regulatory framework S5 S6
2.1.8 Fixed ladders	Fixed ladders should be used only in restricted areas and escape routes. For regular use, inclined staircases with handrails should be provided. Safety rings also known as 'backscratchers' have been proven ineffective and making rescue at height very difficult. Where regulations allow, replace by sliding fall arrest rails. If sliding fall arrest rails are not installed, use a harness and double lanyards with self-locking snap hooks at each end.		GENERAL S58
2.1.9 Mobile Elevating Work Platforms (MEWP)	Power-operated mobile platforms should have priority over cradles lifted by crane, or forklifts. Work at height with personnel baskets should be strictly limited. In this case, lifting appliances should be of a personnel-certified type.		GENERAL

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.1.10 Confined space entry	Confined spaces include: • Spaces not normally ventilated and that have a risk of presenting a non-life supporting atmosphere or toxic/explosive gases • Non-fully enclosed spaces where the atmosphere can become hazardous e.g. use of inert gases • Spaces from which egress or escape may be difficult, or where persons may become trapped • Temporary structures or situations that meet the above criteria. Entry into a confined space cannot proceed unless the specifications are met: • All other options have been ruled out, and there are no practical alternatives to entry • PTW is issued with authorization by a responsible person(s) • The hazards, risks and controls specified in the PTW are communicated to all affected personnel and posted, as required • All persons involved are competent to do the work • All sources of energy affecting the space have been isolated • Testing of atmospheres is conducted, verified safe for occupancy and repeated as often as defined by the permit • Personal gas detectors are regularly calibrated and tested prior to each use • Appropriate PPE is identified and worn • Secure lines of communication are established between worker, standby person and rescue personnel • Intrinsically safe equipment should be utilized as appropriate • Stand-by person is stationed at the entrance of the confined space (buddy system) and maintains communication with entrants during the time they are inside the confined space • Unauthorized entry is prevented • Medic available and on standby for rapid response. There should be a procedure for confined space rescue, including trained personnel and necessary equipment available. The task specific rescue should be addressed in the PTW. All personnel on the crew should be briefed on the dangers of confined spaces and be reminded to never attempt rescue without the proper preparation and equipment. *Note: It has been reported in the oil and gas industry that for every asphyxiated entrant, two would-be rescuers die.*		GENERAL M3 S5 S6
2.1.11 Excavation and ground disturbance (excluding shot-hole drilling)	Work that involves a man-made cut, cavity, trench or depression in the earth's surface formed by earth removal cannot proceed unless the specifications are met. • A risk assessment of the worksite is completed by competent person/s • All associated underground hazards, i.e. pipelines, electric cables, etc. have been identified, located and if necessary isolated • Determine if a Permit to Work is required • Plan and agree design of excavation taking into consideration heavy equipment use • A plan is in place to control access to the worksite • Inspections are completed after man-made or natural events such as heavy rainfall • Where persons enter an excavation greater than 1.5 metres deep: • A confined space PTW should be issued if the entry meets the confined space definition • Ground movement is controlled and collapse is prevented by systematically shoring, sloping, benching, etc. as appropriate • Ground and environmental conditions are continuously monitored for change • There is a procedure for timely extraction and rescue of personnel.		

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.1.12 Hot Work	Compliance with guidelines, requirements and practices in the reference document. Hot work should not proceed unless: • All potential flammable and combustible materials have been isolated, removed and/or protected from the sources of ignition • The work area is assessed for potential flammable atmospheres, and where such a risk exists an authorized person tests the atmosphere prior to the start of the work and during work as often as the permit requires • Levels of oxygen and flammable substances are kept within acceptable ranges or additional barriers applied • Emergency response plans are in place as appropriate given the job's risk assessment and any appropriate site requirements.		GENERAL S5 S6
2.1.13 Non-routine lifting	Contractor should have generic lifting plans in place, approved by a competent lifting authority. Any lifting operation not covered by such plans should be subject to a PTW and a specific lifting plan should be developed and approved by a competent lifting authority. Reference defines 4 categories of non-routine lift, which should be followed as applicable: • Simple • Complicated • Complex/critical • Heavy.		GENERAL S20
2.1.14 Diving operations	Should divers be required, they should be qualified personnel, using certified equipment. Diving operations to be subject to agreement between client/contractor/ subcontractor. A PTW system should be in place with LOTO systems controlling energy sources, and also through the hull suction or discharge systems. For example water inlet or outlet pumps, propellers, etc.		GENERAL S6 S19 S23 S25
2.1.15 Simultaneous Operations (SIMOPS)	Planning for field SIMOPS should include but not be limited to: • Project area description (including all fixed obstructions, infrastructure, oilfield and third party activities, and any geographic boundaries, safe distances) • Organizations involved, key contact information and roles and responsibilities including radio and emergency contacts • Communications process specifying frequency, time, location and work units; • Daily written reporting requirements and distribution • Additional project risk assessment where necessary. Planning should include or reference existing procedures for: • Description of potential emergencies and stop work criteria • Emergency Response and Incident Notification Procedure • Permit to work processes. Planning should consider additional resources that may be required based on field activity complexity, such as a dedicated SIMOPS coordinator.		GENERAL M16 S42 S43
2.1.16 perating hull penetrating equipment	Operating hull penetrating equipment that is not permanently built into the vessel should be subject to a Matrix of Permitted Operations (MOPO), PTW, LOTO and specific procedure. Such operations should be conducted by competent persons.		MARINE

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.1.17 Lone worker	A specific focus regarding the duty of care should be applied to lone worker situations. Employers should identify where people may work alone and risk assessment should be applied and recorded. Example of considerations: • Whether the workplace presents a special risk to the lone worker • Length of time the person should be working alone • Communications • Location of the work • Type or nature of the work • Characteristics required by the individual working alone • The time frame and means to reach person if no contact is made • Controlled periodic checks • Automatic warning devices (e.g. panic alarms, no movement alarms) • Ability to report incidents. Particular attention should be given to: • Bridge/Engine room manning • Lone drivers or pilots • Boat drivers • Back deck operations • Small craft operations • Long haul trips in vehicles. Lone worker implications should include operations such as lone drivers particularly where there is high statistical evidence of failure, e.g. significant number of lone driver fatalities.		GENERAL M10 M20
2.1.18 Short Service Employees (SSE)	SSE programs are typically for permanent employees and not temporary workforce personnel. A process/procedure for managing SSEs may include: • Definition of SSE (e.g. < 6 months in role) • Mentorship • Criteria for exiting the program • Acceptable percentage of SSE in work groups • SSEs in supervisory roles • Identification of SSEs (e.g. green hard hats, arm band, colour of coverall, etc.) • Consideration of whether or not an SSE should be a lone worker, or work on high risk tasks • Job induction for new employees • On the job training including the use of relevant work instructions and risk assessments • SSE participation in crew inductions and HSE meetings • Signed documentation of each SSE's individual progress and graduation from the program.		GENERAL S5

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.2 Emergency response planning			
2.2.1 Procedures for major emergency situations	Emergency situations considered should include at least the following: • Fire for facility/vessel/camp • Abandon ship • Extreme weather • Fuel/chemical spill • Aircraft/helicopter emergencies • Loss of power, propulsion or steering • Towed equipment crash or entanglement • Collision/vessel grounding • Workboat emergency recovery • Man lost/search and rescue operation (SAR) • Vehicles (e.g. collision or rollover) • Third party emergency • Natural disaster • Pandemics • Security: – Interference from activist groups – Civil disturbances and external attacks – Country evacuation – Criminal activity – Piracy – Hi-jacking – Kidnapping – Sabotage – Terrorism • Medevac, including in-field and inter-vessel transport • Man OverBoard (MOB) recovery. Both Emergency Response and Crisis Management should be documented in the Bridging document between client and contractor. Community impact mitigation should be included in plans where appropriate. Consider and provide for the management of potential stresses resulting from any incidents.		GENERAL M1 M2 M8 S1 S3 S5 S6 S7 SEC4 SEC5 SEC6 SEC7 SEC11 H25
2.2.2 Competence and training for emergency responses	All crew members should be clearly briefed on their roles and responsibilities in emergency situations, and should have received appropriate training (e.g. Incident Command System) to fulfil their job in developing emergency plans and during emergency situations. This includes at a minimum, the following roles: • Master and first mate • Party chiefs and operation managers • Fire crews on land operations • Firefighting crews on marine operations – each shift should have at least 4 persons with STCW compliant firefighting training from a recognized body • Fire crews for helicopter operations - Helideck crew should be trained in aircraft-specific fire-fighting training course recognized by OPITO, or an equivalent body • Medic or doctor • Other relevant roles that are part of the emergency response teams. Personnel assigned jobs with physical exertion (e.g. fire crews) should have medical examinations specific to the role.		GENERAL M3 S7 H8 S14

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.2.3 Communication and emergency support	Each work unit (e.g. line cutting crew, drilling crew), fly camps, vehicles, small boats and support vessels in use should have an effective means of communication with the main centre of operations (base camps/main vessel /barge). Communication centres should maintain a log of work unit movements and status, and Persons On Board (POB) count. Vessels and remote operations should have 24 hour per day recourse to assistance from a shore/town support organization. Training and competence as per the reference.		GENERAL M3
2.2.4 Emergency systems for fires on vessels	System to detect and protect from fires on vessels should be in-line with reference and the following: • The preferred type of fixed fire detection system is the self-monitoring type. • Where indicated by risk assessment, fixed fire-fighting systems should be considered in areas of potential fire including, but not limited to: – Over streamer reels – Streamer storage areas – Paint storage areas – Tape storage areas – Engine spaces, generator rooms and compressor rooms.		MARINE S6 S7
2.2.5 Emergency systems for fires onshore	A system to detect and protect from fires onshore should be in line with reference and the following: • Unless there is a documented and well disseminated 'burn down policy' for crew assets, supported by adequate rescue facility for trapped personnel, land field camps should have fire-fighting capabilities which include: fire water, pumps, hoses and a trained fire crew with fire retardant PPE.		LAND S5
2.2.6 Medical emergency response times	Medical emergency plans (Medevac) should meet the following response times, and it should be applied to all units within the project: • 4 min – life saving first aid (level 1) • 20 min – fully trained & certified first aider (level 2) • 60 minutes – paramedic, site doctor (level 3/4) • 4 hours – hospital with medical specialists (level 5). If this is not feasible then a risk assessment should determine what additional resources are needed and can be applied. The risk assessment should address: • Vessel(s) not fitted with helideck and consider any neighbouring installations and local conditions • Areas where helicopters can't fly 24/7 in case of life threatening condition. Real-time monitoring of response times should restrict high risk operations if emergency response times cannot be met. Under certain circumstances the use of basket transfer may be necessary to meet the recommended response times. This transfer method is most frequently used to transfer an ill / injured person from a support vessel to an offshore installation, providing amongst other: • The support vessel is allowed to enter the five hundred (500) metres safety zone • The support vessel has sufficient deck space for the involved basket designed for such transfer • A work instruction and/or risk assessment has been developed and has been approved by the Offshore Installation Manager (OIM) • Such practice should be the last option, e.g. if the person is in a life threatening condition.		GENERAL H3

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.2.7 Safety and survival training	All persons including personnel assigned on behalf of client should receive the relevant survival training before beginning work in the field. For marine operations, transition and shallow seismic this should be a recognized training course, i.e. STCW-95 or BOSIET for personnel working offshore. On land operations, the need for survival training should be assessed, and if applicable, an appropriate formal course of training relevant to the environment and type of operation agreed between client/contractor/subcontractor. Vehicle underwater escape training in areas with significant risk of vehicle entry in water.		GENERAL M3
2.2.8 Helicopters working over water	HUET training is required for personnel flying on helicopters with likelihood of ditching in water.		MARINE M3
2.2.9 Emergency response plan, verification and drills	All emergency response plans relevant to the operation should be verified and subsequently tested on a regular basis, under realistic conditions, but without taking unnecessary risks. An exercise plan, including escalating factors, should be developed covering all ER scenarios: • All drills should have clearly defined scope, scale and frequency • Drills should be followed by a debriefing and a documented evaluation • Response times should be monitored and where relevant, evaluated against pre-defined performance objectives (e.g. rescue at height < 15 min, man overboard, fire team assembly, rescue from confined space) • Drills should occasionally be carried out without warning but announced as 'a drill'.		GENERAL S6 S7
2.3 Contracted services			
2.3.1 Subcontractors	Subcontractors involved in the project should adhere to all contract requirements and be included in the HSE-MS, according to Mode of engagement. Their involvement should include, but not be limited to: • Participation in the project planning • Reporting of incidents • Reporting and participating in SMART leading and lagging indicators • Emergency response planning and arrangements • Vehicle, driving, tracking and monitoring requirements • Journey management.		GENERAL M1 M2 S5 S6 M11
2.3.2 Temporary workforce	Geophysical operations may involve temporary employment of local personnel in varying numbers. The employment of a temporary local workforce has potential to attract a diverse number of significant hazards and risks across the project. The following should be taken into account: • Local recruitment practices • Understanding and empathy with local culture(s) • Health considerations including medical check-up • Living in camps vs local residences • Third party 'followers' and shadow camps • Remuneration • Orientation and training • Composition of work groups • Appropriate supervision and task coaching • Security and discipline • Trade unions or worker's councils • Recreation and entertainment • Catering • Emergency response • Demobilization.		GENERAL M11

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.4 Occupational health and medical care			
2.4.1 Health risk assessments (HRA)	A documented HRA relevant to the operation and jobs on the Crew should be available, which should consider the following risks and also circumstances mentioned in following related sections. Any significant implications of the HRA should be reflected in the project plan, such as: • Prevalent patterns of local disease • Local health and work related health risks • Waste disposal, including medical • Bacteria • Blood borne pathogens • Specific resistant strains ('super bugs') • Substances hazardous to health • Vibration (hand-arm and whole body) and noise. The HRA should include an evaluation of possible job specific health hazards, including but not limited to: • Noise • Food hygiene • Water quality • Ultra violet light (sun light) • Vibration • Substances hazardous to health • Ergonomics • Extreme climates (hot/cold) • Climate control, ventilation and lighting. Some other technology hazards include: • High voltage systems – AUV / EM operations • Potential effect of high voltage in proximity to personnel • Electrolyte in use for AUV operations, splashing when refilling. The HRA should assist in defining: • Surveillance programmes • Awareness and education programmes, e.g. HIV awareness training • Control of substances hazardous to health • Immunization programmes • Need for appropriate medical repatriation insurance to ensure transfer of patient to quality medical care.		GENERAL M5 H4 H5 H7 H9 H11 H18 E5
2.4.2 Environmental health risks in the project area	The HRA should include an evaluation of possible environmental health risks in the area of operation, e.g. urban air pollution, radioactive materials from nuclear testing; based on international standards and expert advice.		GENERAL

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.4.3 Health Programs	As defined by the HRA, Health programs should be developed to include: • Inoculation program • Hearing conservation program: – Awareness training – Hearing protection – Noise exposure limits – Periodic audiometric tests • Control of infectious diseases: – Endemic vector borne diseases – In malaria endemic areas, there should be a Malaria Management Programme (MMP) in place, including, but not limited to: – Awareness Training for personnel; – Bite prevention measures (i.e. sprays, netting, long sleeves and trousers) – Chemoprophylaxis suitable for type of Malaria – Early diagnosis of symptoms and treatment. – Consider including a Tuberculosis (TB) Control Program in TB endemic areas. – Consider infectious diseases control programs for Ebola, Norovirus, etc.		GENERAL H13 H14 H25
2.5 Medical resources (facilities, equipment, medicines and staff)			
2.5.1 Facilities, medical equipment and essential medicines	The standards of medical facilities, equipment and medicines to be provided should be professionally reviewed and be based on the recommendations of the reference, data from the Health Risk Assessment (HRA) and relevant for the medical emergency response times. The following (where relevant) need to be identified and considered: • Location of operations • Land base camps • Fly camps • Ambulances (vehicle and boat) • Medevac equipment compatible with transportation (vessel, inter-vessel, helicopter, platform, ambulance, etc.) • Land/Transition zone (TZ) line units medical kits • Marine seismic vessel • Support and escort vessels • Shallow water/TZ mother vessel/barge • Type of energy source • Unexploded ordinance (UXO)/explosive remnants of war (ERW).		GENERAL H3 SEC11 S53
2.5.2 Trained health personnel	Compliance with the reference and commensurate with the HRA output, and addressing where relevant, requirements for remote line units. Consider qualifications such as Pre Hospital Trauma Life Support (PHTLS) and Advanced Cardiac Life Support (ACLS).		GENERAL H3

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.5.3 Evaluation of local external medical facilities and resources	A documented assessment should be performed on the standards of local medical facilities and resources, covering but not limited to: • Competence and experience of medical and supporting personnel • Range and quality of equipment and supplies • Hygiene standards • Administration procedures and standards • Transportation and communication. Special functions available and location should include but not be limited to: • ICU • Trauma care • Cardiology • Burns unit • Bacteriological/tropical medicine.		GENERAL H3
2.5.4 Remote medical support	The crew should have access to 24/7 remote specialist medical advice and support.		GENERAL H19
2.6 Personal health			
2.6.1 Medical fitness checks	Medical fitness checks, where legally permitted or required, should be recorded and cover the following aspects but not be limited to: • The pre-employment fitness standards (e.g. for Offshore Oil & Gas UK, STCW 95, or Norwegian Maritime Authority) • Pre-employment medical to confirm fitness for the job assigned • Pre-employment substance abuse testing for safety critical positions (all marine personnel should be tested) • Medical checks during employment at a frequency depending on risks associated with employment role • Return to work. More stringent medical fitness standards can be applied for extremely remote environments. Functional agility tests as applicable to the project and role specific requirements. Dental checks should be required for working in remote locations.		GENERAL H1 H3 H8 H12 S14 S27
2.6.2 Lifestyle and health promotion	The provision of a healthy environment in the workplace is a duty of care: • Provision of opportunity for exercise, both mental and physical • Easy and inexpensive communications with family • Opportunity to manage personal affairs and arrangements while assigned to the project. Recreational and welfare facilities should be provided for camps and vessels, which should include: • Telephone, email & internet facilities • Television, video and films • Exercise and sporting facilities • Religious facilities if appropriate. A health promotion programme should be in place, which is appropriate to the level of risk (malaria, smoking, stress, diet, exercise, HIV etc.).		GENERAL S5 S6 S53

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.6.3 Smoking	A written smoking policy should be available, disseminated on the crew and be strictly enforced. The policy should protect non-smokers from exposure to tobacco smoke or e-cigarettes throughout working, recreational and accommodation areas. Unless smoking is completely forbidden at the work site a suitable location for smoking, that doesn't compromise the company policy, should be identified. Smoking should not be encouraged and a programme of assistance to stop smoking is recommended.		GENERAL S6
2.6.4 Substance abuse	A policy should be in place that recognizes the dangers of substance abuse that includes inappropriate use of prescription medicines and alcohol as well as recreational and illegal substances. The possession, use of, or being under the influence of such substances should not be tolerated in the work environment. A programme of reassuring that no substance abuse exists in the workplace should be organized, which can be applied at point of hire, random, periodic and with cause. This should include the provision of the necessary trained personnel and equipment to implement the assurance programme. A rehabilitation programme may be considered.		GENERAL H1 Check for new IOGP ref on D&A testing
2.6.5 Prescription Medication	Upon arrival at site or when prescribed, all medication should be declared to the medical officer or authorized person on the operation.		GENERAL
2.7 Health and hygiene standards			
2.7.1 Land accommodation facilities	The crew accommodation should be designed, constructed and maintained to comply with the reference(s). Hygiene standards on land facilities should be professionally managed by a competent person such as the camp boss.		LAND S5 S6 S31 S32
2.7.2 Marine accommodation facilities	The crew accommodation should be designed, constructed and maintained to meet the following considerations but not limited to: • Separate bed for each person with free floor access between beds or bunks; curtains for bunks if more than one in same room. Ladders for safe access to upper bunks • Good quality and clean bedding made of approved materials which can be easily cleaned. No polyurethane • Sanitary facilities including toilets, showers and washbasins • Showers and wash basins should have hot and cold running potable water • Space for secure storage of personal possessions, including individual clothes lockers • Adequate number of electrical outlets for personal appliances • Adequate laundry facilities • Provision of carbon monoxide detectors where potential sources exist • Smoke detectors, fire alarms, fire extinguishers and life jackets as per SOLAS requirements. Flash lights or similar for escape in darkness • Smoke hoods in cabins, with restricted egress • Adequate escape routes with emergency lights • Muster stations, emergency signals and escape routes posted in each cabin • Emergency cut off for electricity • Adequate heating, air conditioning and ventilation • Low noise and vibration • Adequate lighting in rooms and bedside reading lights • Compliance with reference.		MARINE S27
2.7.3 Domestic animals	Pets and other domesticated animals should be prohibited from all crew facilities.		LAND S31 S32

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.7.4 Toilet and sanitary facilities in base and fly camps	Compliance with reference(s)		LAND S31 S32
2.7.5 Sewage, grey water disposal	Compliance with reference(s)		GENERAL E6 E7
2.7.6 Cleaning and housekeeping	Procedures should be established for camp/vessel cleaning and housekeeping (to mitigate possible health risks) which include: • Cleaning schedules and their scope • Monitoring and inspections programmes • Pest control • Laundry • Domestic waste removal.		GENERAL S5 S31 S32
2.7.7 Water supplies	Sufficient potable water per person per day from acceptable sources should be provided and maintained for all personnel at all locations: • Drinking water standards as reference • Regular testing for chemical and bacteriological contamination (including legionella), with water samples taken from several points of use • Potable water should be used for showers		GENERAL S5 H9 H11 H20
2.7.8 Kitchen/galley facilities	The crew kitchen/galley facilities are designed constructed and maintained to comply with the references. Use of hazard analysis and critical control points (HACCP) principles.		GENERAL S5 S6
2.7.9 Eating places and provision of meals	The crew meal provision service is designed, constructed and maintained to meet the reference. The following should be included: • The catering arrangements should consider number of people, the shift pattern, dining facility capacity, sanitary conditions and timing • At least two meals per day, one being hot.		GENERAL H11
2.7.10 Food handlers	The crew food handlers should have: • Medical examinations every 6 months (may be subject to local regulations) • Additional test for TB (chest X-ray), ova parasites, hepatitis, HIV should be available at the start of the job • Valid medical certificates • Received food handling training • Sets of PPE catering clothing issued, kept clean and replaced if damaged.		GENERAL M3 S5 S6 H8 H11
2.7.11 Food supplies and storage	The food provided should meet the following criteria: • Quantity and quality adequate • Is in date (shelf life adequate); • First in, first out system is in place • The delivery temperatures are adequate • A food segregation system is in place • A monitoring system is in place for frozen and other food storage temperatures • Food not accessible to vermin • Food waste protected from vermin.		GENERAL S5 S6 H11 E5
2.7.12 Food preparation, and cooking	Contractor should ensure that the quality of food preparation, water utilized and storage conditions are managed through an efficient process by a competent person. During food preparation, a food segregation system should be in place.		GENERAL S5 H11

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.8 Hazardous materials			
2.8.1 Control of Substances Hazardous to Health (COSHH)	The controls recommended by the HRA relating to substances hazardous to health should be in place and the identified specific risk areas should be addressed. Contractor should ensure the proper implementation of procedures for the inventory, handling, storage, use and final disposal of any substances or material considered as toxic or hazardous to health under the relevant regulations. Support information can be obtained from COSHH regulations or equivalent from various countries. The crew and line management should have awareness, knowledge and understanding in the management of substances hazardous to health. Personnel working with hazardous chemicals should be trained handling, use and disposal of such chemicals. There should be an accurate and current inventory of all substances hazardous to health. There should be Safety Data Sheets (SDS) for all substances in the inventory at key locations such as: • Site clinics • All locations of regular storage. In other locations simplified SDS or hazard awareness cards should be provided: • Easy access to all crew members in common language • At any locations of regular use.		GENERAL M3 S5 S6
2.8.2 Storage of chemicals, oxidants, acids	Procedures should be in place which include, but not limited to, the following controls: • Appropriate hazardous communication Training programme • An inventory of all hazardous materials is maintained by the crew: relevant SDS to be available at the storage location, work location if appropriate, and at a location accessible to all crew • Stored according to SDS • Isolated from offices, accommodations, and other work areas • Appropriate PPE available near storage • Eye wash station • Emergency shower if appropriate • Chemicals clearly labelled and stored in proper containers • Chemicals assessed for compatibility with other stored chemicals, conditions and proximity • Adequate ventilation • Appropriate fire extinguisher media. Training including practical experience should be provided for specific recovery equipment.		GENERAL M1 M3 S5 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.8.3 Lithium battery handling	Contractor should have a Lithium Battery management procedure which should be based on the manufacturers' specifications of the products used. Procedure should include: • Personnel handling lithium batteries or equipment containing these should be trained in the handling of lithium batteries and the risks related to them. • Suspect batteries or equipment containing these (odour, smoke or heat) should be discarded securely in the open air or very well ventilated space, and kept separate from other batteries or equipment • Electronic equipment such as birds showing signs of heating from lithium battery self-ignition should not be kept in a Workboat and should be ditched immediately into the sea. The same is recommended for back deck operations • No attempts should be made to open or repair equipment containing suspect lithium batteries until cooled down and vented (minimum 24 hours delay) and this should be done by qualified personnel using appropriate PPE • If the batteries are rechargeable, fit-for-purpose chargers should be used to avoid over charging.		GENERAL S5 S6
2.8.4 Lithium battery storage	Lithium battery storage should include: • Suitably signposted • Dedicated storage cabinets not used for other products • Well ventilated, cool and dry (< 30 degrees C, < 80% humidity) • Heat resistant (steel or concrete) • Batteries to be kept in their original packaging (also for used batteries) • Used and new batteries to be kept separate, preferably in separate stores. • Segregated in small quantities to prevent massive chain reaction in case of self-ignition • Heat detectors and alarms • Sprinklers or water deluge firefighting or fire hydrant with adequate capacity Where Lithium batteries are stored or used a Lithium Emergency Response kit should be available, with personnel trained in its use. Note: As the lithium in the batteries is sealed, Class D fire extinguishers are not effective. Also, the actual lithium content in a battery should burn off in a matter of seconds. Large volumes of water should be used to absorb the heat created by self-ignition of a battery.		GENERAL
2.8.5 Handling/storage of other types of batteries	All battery types should be stored correctly in designated areas. This includes small alkaline batteries. Personnel should be trained in handling and disposal procedures. Spent battery terminals should be isolated.		GENERAL M3 S6
2.8.6 H_2S (oil installations)	If there is a risk of exposure to H_2S, controls should be in place, including but not limited to: • Recognized H_2S training • Portable H_2S alarms • Breathing apparatus available • Wind socks • PPE as required • Personnel are aware of appropriate escape routes • Rescue equipment and Emergency Response Plans.		LAND S5

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.8.7 Radioactive sources	Project risk assessments should consider exposure to potential sources of ionizing (alpha, beta, gamma, x-ray, neutrons) and non-ionizing radiation (UV light, infra-red, lasers, radio and microwaves). Sources of radiation include: • nuclear test sites • battlefield risk areas • depleted uranium • non-destructive testing equipment (NDT) • naturally occurring radioactive materials (NORM) • Radon, etc. Contractors and subcontractors should be notified by the client, as soon as practicable, of potential exposure to radioactive sources when identified during preliminary project risk assessments and a realistic estimate of exposure doses and frequency should be made. Competent advice should be sought to assist planning, design of control measures, dosimetry and recording requirements, monitoring performance and contingency planning. Dose limits should not exceed local legal requirements or the ILO reference. The principle of radiation control is based upon a triangle comprised of exposure, distance, and shielding. These three factors should be taken into account when determining risk mitigation measures.		GENERAL H21 H22 H23 H24
2.8.8 Dusts (desert dust, shot hole drilling dust, abrasive materials, silica)	Dust particles may clog and accumulate inside the lungs reducing lung capacity. Silica dust can be produced during shot-hole drilling in certain areas. Exposure to free respirable crystalline silica (RCS) has been associated with silicosis, which is not curable. • Information and induction briefings should be provided where people may be exposed to dust, including dust abatement methods and PPE • Where dust exposure occurs, sampling methods and analysis should be employed to determine the workplace exposure time-weighted average (TWA) • Survey results should be provided to the affected workers and provide mitigation requirements such as Respiratory Protection Equipment (RPE) • RPE maintenance and replacement schedule should be based upon exposure, dust particle size and concentration • Dust suppression methods should be evaluated, tested and installed on drilling rigs. Some effective dust suppression methods include: Venturi, Vacuum, water injection and blower fan.		LAND S30 S33
2.8.9 Asbestos	Asbestos should not be used. The presence of asbestos should be formally recorded in the asbestos management plan and advice posted with certification describing: • Type • Applicable restrictions. Only registered specialists can remove asbestos unless the type of asbestos is certified otherwise. Asbestos free vessels should provide certificate to this effect.		GENERAL S34

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.9 Work environment			
2.9.1 General controls	Information and induction briefings should be provided as well as the appropriate PPE corresponding to the hazards present in the work environment		GENERAL
2.9.2 Noise	The following should be available on the crew to manage noise risks: • Information on the noise generated by equipment • Noise assessment surveys results (e.g. noise level map) should be addressed according to a hierarchy of controls (elimination at the source, isolation using enclosures, exposure time, controlled access and PPE requirements) • Information and signage.		GENERAL S33 S35
2.9.3 Cold climates (heat loss)	Workers should be made aware of risk of frostbite and hypothermia. Procedures should be in place for working in the cold including the provision of warm-up breaks, shelters, and suitable PPE.		GENERAL H2 S5
2.9.4 Hot climates (heat stress)	Workers should be made aware of risk of heat stroke and dehydration. Procedures should be in place for working in hot climates, including provision of shade and adequate quantities of cool water for breaks.		GENERAL H2 S5
2.9.5 UV light	UV light is a component of sunlight that is also found in arc welding, tungsten halogen lamps, food and water sterilization lamps. Chronic effects of exposure to UV radiation are premature aging of skin and cancer. Workers should be made aware of risk to UV exposure and be provided with: • UV protective gear including clothing, glasses and hat • High protection factor sunscreen for exposed skin (should not be used as substitute for covering up) • provision of screened covered areas • interlock systems to UV lamp-housing • all surfaces made dull or matt black to prevent reflections • Welders full body cover and face shield.		GENERAL
2.9.6 Hand-arm vibrations (HAV)	Exposure to vibrations can cause a range of conditions known as Hand Arm Vibration Syndrome (HAVS). This includes carpal tunnel syndrome and 'vibration-induced white fingers'. Vibrating frequencies between 2 to 1,500 Hz can be harmful and more potentially damaging between 5 and 20 Hz. Other factors to consider include: • Strength of the grip required to operate tool • Tool position and orientation • Length of exposure and rest periods • Frequency of exposure • Ambient temperature (affecting blood circulation) • Individual characteristics including age, health and general wellbeing. The following should be available on the crew to manage HAV risks: • Information on the vibration levels generated by the equipment • Signage regarding vibrating tools and activities where HAV is a risk • HAV assessments on the use of vibrating tools. Any employee diagnosed as suffering from HAVS should receive advice from a Doctor or Occupational Health Medical Practitioner.		GENERAL H16 S33

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.9.7 Whole body vibration (WBV)	Where there are vibration risks the employer should complete a specific risk assessment of exposure including the following: • Observation of specific working practices • Reference to relevant information on the probable magnitude of the vibration corresponding to the equipment used in the particular working condition. If necessary, the employer should take measurement of the magnitude of vibration to which employees are exposed. A common effect of WBV is lower back pain. Regular drivers are particularly at risk. Preventive measures may include: • Provide fully adjustable driver seat and easily accessible controls to minimize twisting, bending, leaning and stretching to operate equipment • Improve driver posture • Provide frequent breaks to move and change body position • Reduce manual handling and lifting of loads by the driver • Provide steps to facilitate access to and from a high cab, minimizing climbing and jumping down.		GENERAL H17 S33
2.9.8 Ergonomics	Workspace ergonomic design lay out and positioning should be based on the results of the health risk assessment. The risk of muscular-skeletal strain associated with lifting and working in difficult terrain should consider: • Provision of lifting and handling training • Provision of lifting and handling aids • Identification of an appropriate maximum weight limit for normal lifting is encouraged.		GENERAL M3 S5 S6 H3 H18
2.9.9 Climate control, ventilation and lighting	In order to maintain worker's good health and wellbeing, every enclosed workplace should be ventilated by a sufficient quantity of fresh or purified air. • Stale, hot or humid air as a result of workplace processes or equipment should be replaced at a reasonable rate • Where necessary, mechanical ventilation systems should be fitted to permit adjusting temperature and humidity. Re-circulated air should be adequately filtered to remove impurities • The temperature in workrooms should provide reasonable comfort without the need for special clothing • Lighting should be sufficient to enable people to work without experiencing eye-strain • Local lighting should be provided at individual workstations, and at places of particular risk, such as stairs, walkways and evacuation routes • Workplace lighting design should consider qualitative aspects of lighting that should affect people's perception of their work environment, such as glare, light distribution, brightness, diffusion and colour rendition • Lamps/luminaires need to be kept clean and replaced on a regular basis, as illuminance levels decline with age • Light measurements can be made with a pocket light-meter to determine the average illuminance and minimum measured illuminance. These should be compared against the illuminance recommendation per activity and location provided in the reference.		GENERAL S36

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.9.10 Working hours and working schedules	Crew working hours and working schedules should meet the following: • Compliance with the relevant regulations (e.g. STCW) • Seek ways to honour the ILO reference when faced with conflicting national requirements • A maximum of 12 hours per day for jobs with significant manual work (line units, drilling units) • A maximum 15 hours per day for line managers • A minimum 7.5 hours rest period per day • Adequate care and planning given to the provision of rest, with a maximum shift length of 6 months, and not more than 3 months for HSE critical roles • Working overtime should not be allowed on a regular basis • Fatigue management should be applied in assessing travel and work schedules, in particular for HSE critical roles.		GENERAL S3 S5 S6 H6 H15 H26 SR10
2.10 Natural & man-made hazards			
2.10.1 Lightning	Lightning procedure to be in place as applicable. When lightning is identified as a project risk, contractor should plan for a fixed detector at prominent locations, e.g. recorder, flight tower, radio room and for portable detectors for field crews.		GENERAL S5 S21
2.10.2 Drowning	Drowning has been the second highest cause of fatality in the geophysical industry and occurs mostly in land operations. Marine operations fatalities have occurred as a result of falling overboard. A risk assessment of drowning should be conducted and recorded for all operations. At risk examples are: • Falling into and then not being able to get out of pits (e.g. ponds, mud pits, oil sumps) • River crossings • Taking short cuts • Not waiting for boats • Voluntary entry • Recreational water sports • Diving • Inability to swim • Swept overboard • Over the side toilet activity • Wearing heavy rubber boots. Some control measures include the provision of floatation devices, swim tests and rescue plans.		GENERAL M10 S25 M12

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.10.3 Weather, terrain, flora and fauna	The relevant natural hazards should be identified, assessed and taken into account during the planning of the project including where relevant: • Weather (sun, ice, snow, rain, fog, lightning, hail, wind, heat, cold) • Weather secondary effects (floods, landslides, sandstorm, static electricity) • Geological (volcanoes, earthquakes, tsunamis, radon, methane, H_2S, cave-ins, Karst, sink holes, quicksand) • Avalanche (snow, ice, rock, mud) • Tides and currents (river bores, coastal effects, flash flooding, rogue wave events) • Bush fires • Fauna (venomous, poisonous, aggressive) • Flora (poisonous, penetrating [sharp], barrier). Effective control and recovery measures should be in place, including where relevant: • Matrix of Permitted Operations (MOPO) - Which activities should be permitted in adverse weather • Weather forecast from more than one source • Current monitoring and tidal prediction • Tsunami, rogue wave warning systems • Anti-venom and anti-histamine • Bee elimination procedures.		GENERAL S5 S6 H5
2.10.4 Shallow-water	When planning to operate in shallow-water survey areas the following should be utilized as applicable: • Accurate and up to date bathymetry • Side scan surveys • Satellite imaging • Up to date charts • Tidal charts • Any available depth hazard information (obstacles, pipelines, ship wrecks) • Environmental Baseline Studies and/or Environmental Impact Assessment information from the client • Management of equipment resources (types and number of vessels, tracking, etc.) • Redundancy/calibration & reliability of equipment • Scouting and escape routes.		GENERAL
2.10.5 Personal Floatation Devices (PFD's)	Personal Flotation Devices (PFDs) should be appropriate to task and purpose. Assessment for application should be recorded and include justification for application. All exposed staff to be trained in appropriate use and inspection of PFD's. These should be worn in the correct manner. In any case, dual chamber and dual cylinders are recommended for inflatable life jackets.		GENERAL S5 S10 S7 S38

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.10.6 PFD assessment	PFD assessment should include, but not be limited to: **Purpose of PFD:** • To give buoyancy where there is intention or requirement to enter the water (inherent buoyancy) • To protect life in case of accidental entry to the water (auto inflate buoyancy) • To protect life in case of submersion (e.g. helicopter or inside the cab of a fast boat) (manual inflated buoyancy). **Buoyancy capacity requirement:** • A 50 Newton inherent flotation device may be appropriate to assist in shallow, wading depth with minimal clothing (simple coveralls) • A 150 Newton auto inflatable life jacket may be appropriate when there is a potential to fall into water wearing normal clothing • A 275 Newton auto inflatable life jacket may be appropriate when there is a potential to fall into water wearing additional clothing and equipment • Buoyancy conflicts and compatibility should be considered (e.g. when worn with clothing already containing inherent buoyancy such as an exposure suit). **Whether additional specification is necessary such as:** • Spray hood • Water activated location light • Personal locator beacon (VHF and GPS); • Whistle (pealess) • Reflective tape • Rescue (lifting) harness • Automatic and manual inflation. **Design:** • Ease of donning • Adjustment including crotch strap if a design requirement • Comfort or wear and profile in use (i.e. can it be worn without interfering with the task at hand?) • Adequacy of fastening • Length of potential time in the water		GENERAL S7 S38 S41
2.10.7 Overhead power lines	Crews should have procedures in place when working in areas where overhead power lines exist. The use of hazard maps is recommended. Procedures should include: • Shot holes should be placed at a distance that is more than twice their depth away from the overhead powerline • Care around high voltage power lines to prevent induced voltage and arcing • Minimum horizontal distance required from the hazards • Potential determination of exclusion zones.		LAND S5

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.10.8 Explosive Remnants of War (ERW) and UneXploded Ordnance (UXO) requiring clearance	A comprehensive set of ERW/UXO clearance procedures should be developed based on Client's specialized assessment of the area. These should include but not be limited to: • ERW risk assessment to identify Suspected Hazardous Areas (SHA) and immediately release all other land for use • Non-technical survey to identify Confirmed Hazardous Areas (CHA) within SHA and immediately release remainder for use • Technical survey to identify Defined Hazardous Areas (DHA) within CHA and release remainder for immediate use • ERW clearance to release DHA for use if avoidance of the DHA is not possible • Compliance with relevant local military and civil regulations • Qualified specialists should be contracted to locate and if necessary destroy ERW/UXO • Provide visible marking of hazardous zone • Strict enforcement of procedures on access to danger areas • Go/no-go instructions • Daily report on ERW/UXO clearance and accessible areas • Training and meetings on the danger of ERW/UXO and identification of restricted areas • Provision and use of specialist ERW/UXO clearance PPE • Crew awareness/training of nature of ERW/UXO • Locations of known and cleared ERW/UXO should be mapped.		GENERAL SEC11 SEC13
2.11 Environment			
2.11.1 Environmental Baseline Study (EBS) and Environmental Impact Assessment (EIA)	EBS/EIA undertaken on behalf of the client should be made available to contractor at the tender stage or whenever completed. The recommendations should be reflected in part of the Project HSE Plan. Reduce the potential intrusion of alien invasive species based on an understanding of pre-existing ecological conditions and potential operational threats (from vessel, contaminated wheels, etc.).		GENERAL E6 E13
2.11.2 Project Environmental Management	Contractor should document its anticipated project environmental management activities. Contractor should define environmental objectives, implement controls (mitigation measures) and monitor performance to meet relevant legal and regulatory requirements. • Contractor and crew management should have completed appropriate environmental management training; • Recommendations of relevant EBS/EIA should be taken into account • Training (and other controls) should address recovery measures necessary to minimise significant effects on the environment under operational and also emergency situations • The controls should as a minimum be in compliance with relevant sections of references.		GENERAL M3 E1 E2 E3 E4 E5 E6 E9 E10
2.11.3 Specific Waste Management	Contractor should manage waste generated by the project in compliance with the references, the foregoing and the following: • Regulatory requirements including MARPOL • Implement waste management strategies such as Prevent, Reduce, Re-use, Re-cycle, Recover • Controls identified by EBS/EIAs and any environmentally significant aspects that have been identified by client, contractor, subcontractor. • Confirmation of a formal and documented process of selection and monitoring of waste disposal subcontractors and include: • Seek to minimize and strictly control the export of hazardous waste • Emphasis recycling opportunities and the use of biodegradable materials.		GENERAL E5 E7

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.11.4 Non-hazardous waste	Non-hazardous waste may include: waste from offices, operational, residential and camp locations, etc.): • Industrial waste (wooden pallets, plastic, cap wire, survey pegs, camp construction waste, scrap metal, etc.) • Domestic waste (kitchen waste grey water) • Office waste (used stationary, plastics, printer and toner cartridges, tapes and disks). Biodegradable detergents and products qualified as non-hazardous, to be used, where at all possible.		GENERAL E5 E6
2.11.5 Hazardous waste	Hazardous waste may include: • Medical waste • Oily waste (spent lube oils, etc.) • Chemical waste (batteries, obsolete chemicals shot/up hole drilling mud etc.) • Black water and sewage sludge which should not be disposed of untreated • Toxic materials (PCBs, etc.) Approved waste disposal services should be identified and used wherever available. Documentation confirming appropriate safe disposal of hazardous waste (e.g. receipts from licensed waste management subcontractors) should be retained. Where new technology provides new hazardous waste, it should be identified and best practice should be maintained.		GENERAL E5 E6
2.11.6 Ozone-depleting substances	Halon-based fixed and portable fire suppression systems should not be used. • Halocarbon inventories and losses should be recorded on an annual basis • Appropriately qualified and licensed subcontractors should be used to perform maintenance on equipment containing halocarbons • Redundant halocarbon stock should not be sold to third parties • Preventative maintenance programmes meeting manufacturer recommendations should be implemented to minimize leaks of ozone depleting refrigerants (e.g. Freon, Halon) from items of equipment.		GENERAL S6
2.11.7 Marine life and sound	Mitigation and monitoring measures as defined by applicable national guidelines or requirements. In the absence of national requirements, use of industry practices such as: • Survey timing/duration to consider sensitive/protected areas and species • Exclusion zone for monitoring purposes • Visual monitoring • Soft-start procedure • On-board Marine Mammal Observers (MMOs) or Protected Species Observers (PSOs) trained to local regulatory requirements • Source delay and/or shut-down procedure (for marine mammals, turtles, etc.) • Turtle guards on tail-buoys and similar deployed equipment • Reporting of sightings and environmental incidents • Training for personnel in local marine ecology and marine life. These practices may be supplemented by other specific measures based on the outcome of a project specific risk assessment. For example: • Passive Acoustic Monitoring (PAM) • Sound source verification.		MARINE E8 E12 E14 E15 E16 E17

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.12 Social Responsibility			
2.12.1 Social Impact Assessment (SIA)	SIA undertaken on behalf of the client should be made available to contractor at tender level or whenever it becomes available. SIA may be separate or as a combined assessment with EIA. The SIA recommendations should be reflected in the project plan.		GENERAL E6 SR10
2.12.2 Stakeholder mapping, including the interaction of the project with third parties	Stakeholder mapping undertaken by company should be made available to contractor upon award of the contract, or later whenever it becomes available. Such mapping should highlight the relative levels of positive or negative influence of stakeholders on the project. Responsibilities should be clearly identified and agreed between client/ contractor/subcontractor. Assess and document the third party activities (including local community livelihoods) that might routinely exist in the area of operation. Document the procedures that are to be followed in case of interaction occurring. Events to be addressed may include: • Competent management (client, contractor, subcontractor) to handle community and media/public relations • Interaction with fishing vessels and general shipping • Interaction with other commercial or leisure activities • Interaction with other oil and gas related operations • Interaction with the general public • Interaction on public highways • Interaction with farmers and/or their animals • Interaction with commercial and artisanal fishing and/or hunting activities • Interaction with refugees • NGO protests • Interaction with stowaways • Authorities, emergency services and public utilities • Any entities from which permits, approvals or support are required.		GENERAL M3 E6
2.12.3 Health Impact Assessment on local communities	Health Impact Assessment (HIA) undertaken on behalf of the client should be made available to contractor at tender stage or whenever it becomes available. Recommendations should be reflected in the project plan		GENERAL E13 SR10
2.12.4 Project Social Impact Management	Client, and then contractor, should document its anticipated project social impact management activities. This should include defining social objectives, implement controls and monitor performance to meet relevant legal/regulatory requirements. Other aspects to be considered: • Recommendations of relevant SIA and HIA should be taken into account • Controls, including positive relationships, local content and training, should be implemented to maintain the agreed performance standards for each impact identified and any mitigations necessary to minimize negative effects and maximise effectiveness of sustainable positive contribution. At tendering stage, client and contractor should agree on the assignment of responsibilities including, but not limited to: • Respect for human rights • Respect and awareness of local communities • Assigning community liaison officers by both client and contractor • Obtaining formal permission for access to prospect area • Management of the local temporary workforce and local contracted services • Fair and prompt compensation for negative impacts resulting from the project • Grievance procedure (communities and workers) • Local communities monitoring and close-out report.		GENERAL E14 SR1 SR3 SR4 SR5 SR6 SR7 SR10

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.12.5 Key elements for management of temporary local personnel	Contractor should provide details of how temporary workforce(s) should be managed, based on a detailed analysis considering project, location, culture, literacy and education.		GENERAL M11
2.12.6 Cultural property and archaeology	Activities and facilities should be located to avoid cultural property and archaeology as a first priority and where this is not practicable/feasible should minimize any impacts. • Relevant stakeholders should be consulted to improve understanding of cultural property and archaeology issues in an area of operation • A 'chance finds' procedure should be developed and implemented in areas where there is potential for previously unknown cultural property or archaeology to be encountered during project operations • All cultural property and archaeology findings should be secured, recorded and reported to the appropriate national authority and local stakeholders.		GENERAL S5 E6
2.13 Transport – ground and water			
2.13.1 Integrated project transport management - ground and water	Integrated transport (logistics) management should be in place to include: • Comply with local legal and regulatory requirements • Focus on reducing transport exposure • Selection of the safest mode of transport (road, water, air, train) • Take into account the road/river/water hazard identification for the area • All client, contractor and subcontractor vehicles/craft involved with the project; • Where the operation involves the use of subcontractor vehicles /craft there should be: – Pre-qualification, including driver testing – Acceptance inspection. Driver and coxswain working hours should be recognized as part of a labour intensive HSE critical job and adequate rest hours should be planned. Any loading and home-work travel time to be taken into account.		GENERAL S3-1 S3-6 S3-13
2.13a Ground transport			
2.13a.1 Inventory	There should be a comprehensive inventory of vehicles describing: • Type, number of units and allocation of units • Speed limits on and off road • To be used off road only, off road and on road or on road only • Equipped with speed limiting device yes/no • Equipped with IVMS yes/no • Equipped with VTS yes/no • For carrying passengers yes/no • Passenger seating arrangement and maximum number of passengers • Cargo load limits • Maintenance schedule • Type of tyres (tread, temperature ratings) and pressure • Exotic modes of transportation agreed between client and contractor and contractually recorded.		GENERAL S3

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13a.2 Vehicle selection and properties	Vehicles should: • Be fit for the intended purpose and demonstrably well maintained • Be essentially compliant with manufacturer's specifications and the referenced standards • Meet local legal limits and regulatory requirements • Have a strong reputation in terms of safety and endurance/reliability • Have seats to be forward or rearward facing, not sideways. Folding seats to be securely lockable and adult rated • Not have protruding or sharp objects in bodywork which could injure passengers or pedestrians • Have cargo areas segregated from passengers or have cargo securing nets or not be used for cargo and passengers simultaneously. Client and contractor should agree on light and heavy vehicle age and mileage limits. Special purpose vehicles (Instrument or drill trucks, buggies) which do not drive much should be given special considerations. Buses: • As above for heavy vehicles and: • Have as a minimum two escape exits placed on different sides of the vehicle (side, top or rear, can be windows of suitable size equipped with emergency hammer) • Body strength should conform to US DOT FMVSS regulations, EC regulation 66 or ADR 59 to ensure sufficient roll over protection • Passenger carrying trucks should meet the specifications provided in TRL report referenced • Access door should be on the kerb side of the vehicle • Preferably diesel powered where fuel supply needs to be in own camp, to avoid the risks related to storage and handling of large quantities of petrol. Not acceptable: • Motor bikes, two or three wheeled • Open quads or ATV's (i.e. without Roll over and passenger protection) • Saloon cars with no or weak superstructure (i.e. cabrio's)		GENERAL S3 S3-14 S3-15 S3-16 S24
2.13a.3 Vehicle equipment - all vehicles	All vehicles should comply with the reference. In addition should be fitted with: • Reversing alarm • Means of two way communication • Flash light • Reflective jacket for at least the driver • Where it may be expected that vehicle engines are left idling for climatic conditions (air-conditioning, heating) CO detectors in driver and passenger cabins • GPS navigation system • Emergency response information.		GENERAL S3 S5
2.13a.4 Vehicle equipment - light vehicles	Light vehicles (< 4 T and < 8 passengers) should have: • Side impact protection • Adjustable side mirrors on driver and passenger side • For pick-ups and larger light vehicles: – Wheel chocks		GENERAL S3
2.13a.5 Vehicle equipment - heavy vehicles	All heavy vehicles should comply with the reference. In addition they should have: • Step and grab handles for getting into the drivers cab.		GENERAL S3

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13a.6 Vehicle equipment - buses and passenger carriers	All buses and passenger carriers should comply with the reference, and heavy vehicles line item above. In addition they should have: • 3 point seat belts for driver and front passenger and seats with open space in front of them (if not fitted, these seats not to be used) • At least two point seat belts for all other seats • Clear signs for emergency exits • In hot climates: sun shade tarpaulins.		GENERAL S3
2.13a.7 Vehicle equipment - trailers	• Full operational lights, brake lights and indicator lights • Effective braking system compatible with the towing vehicle.		GENERAL
2.13a.8 Vehicle equipment -tanker trucks	Same as for heavy vehicles, plus: • Roll over protection on driver cabin • Baffles or surge plates in the tanks • Ladder, non-slip walkway with (foldable) rails for secure access to top hatches • Double skinned tankers are preferred for fuel transport • To be driven with empty or full tanks, half full to be avoided.		LAND
2.13a.9 Vehicle equipment -emergency response vehicles	Compliance with the reference.		GENERAL S3-16
2.13a.10 Wheel design	Fatalities have occurred when inflating certain types and designs of wheels. Wheels constructed with a multi part securing ring ('split rim') should not be used where suitable single part rim types are available. Where multiple piece or split rims are unavoidable, appropriate protection is required when inflating tyre during assembly, fitting (e.g. wheel and tyre cage) and re-inflation after passage through soft sand (sprocket). Drivers of vehicles fitted with such wheels should be given training for the inflation of the tires.		GENERAL
2.13a.11 Tyres	Tyres should be free of any visible damage, abrasion, cracks or cuts and should be regularly inspected (both sides!). Tyres, including spares, to be of same construction, type, profile and thread. 'Remould' or 're-tread' tyres not to be used. Minimum thread depth 3 mm across 75% of the tire width and with a visible thread pattern across 100% of the tire surface. Temperature rating (A, B, C) and traction grading preference (AA or A) applicable to the operating climate and conditions (e.g. winter tires). Load capacity suitable for the type of vehicle and maximum speed. Tire pressure should be kept within the manufacturer recommended range and be checked regularly. Contractor should have a tire change procedure and drivers should be trained in the use of this. Best practice is to remove the weight from the tires and protect from sun exposure when trailers are stationary for a long time.		GENERAL
2.13a.12 Tyres in soft sand	Tyres may be deflated for use in soft sand and where this may be done, the vehicle should have a pressure gauge and equipment to re-inflate the tires.		LAND

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13a.13 Roll over protection	Roll over prevention built into vehicle design by the manufacturer is preferred. Roll over protection systems (ROPS) are recommended where there is an increased risk or history of roll over resulting in serious injuries. ROPS should be properly engineered. Such construction should meet the IIHS roof strength criterion 'Acceptable' or 'Good'. The TRL report should be applied to the modification of vehicles. Factors to be taken into account in deciding whether ROPS would be required are: • Roof strength of the vehicle • Likelihood of roll over occurring as a function of vehicle type and terrain or road conditions. Off road terrain conditions usually increase the likelihood of roll over significantly. Vehicles with a high centre of gravity are more prone to roll over. Typically this would be SUV's, Pickup trucks and minivans. These same vehicles often do not have sufficient roof strength to ensure the maintenance of sufficient survival space in case of roll over. The higher the speed at which a roll over occurs, the more severe the impact on the roof should be. In view of the above, the following is recommended: • Saloon cars or sedans should not benefit from ROPS • SUV's or Pick Ups that meet IIHS roll over crash testing criteria 'Acceptable' or 'Good' do not require ROPS • Vehicles used predominantly in an urban environment or on low speed country roads do not require ROPS • All other vehicles, in particular SUV's, Pickup trucks and Minivans should be fitted with ROPS • A more formal technical criterion is based on the so called static stability factor (SSF). • SSF = W/2H, where H is the height of the centre of gravity and W is the width of the wheel base, measured from the outside of the tyres • ROPS is recommended in case SSF < 1.25. In view of industry history ROPS is further strongly recommended for: • Driver cabin of tankers • Driver cabin of Heavy Goods Vehicles (HGV) if to be used in steep terrain or dunes. ROPS should be designed to meet the IIHS roof strength criterion 'Acceptable' or 'Good'. ROPS should preferably be mounted externally and not interfere with other vehicle safety design aspects or devices, such as crumple zones or airbags. Internal ROPS should be suitably padded with shock absorbing material.		GENERAL S3 S24

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13a.14 Off road driving	Off-road driving is subject to a number of exceptions described in the guideline. Drivers should be given specific off road driving training as relevant for the area of operations. Off road speed limit should be 40 km/hr, preferably enforced by a speed limiting device, possibly set to slightly higher value to allow acceleration to ascend sand dunes. For off road driving a base plate should be provided for the jack. Slow moving, walking pace operations where personnel are deploying equipment from vehicles may be desirable. In these circumstances assessment should be conducted to determine acceptable work practices, controls and recovery. Low speed tip or roll overs in sand dunes need not be recorded as a motor vehicle crashes. However, there is still significant potential from both event and recovery, and such incidents should be recorded appropriately. Light vehicles to be fitted with buggy whip flex shaft flags in sand dune areas. Equipment for getting vehicles unstuck from soft sand as appropriate (connection points for towing, winch, boards, shovels, etc.) ABS not needed off-road.		LAND S3-7 S3-5
2.13a.15 Special vehicles and situations, bulldozers	Hazard identification and risk assessment to be conducted to decide on the need for special protection of special vehicles. For Bulldozers: • Roll over cage and protective canopy for driver cab to protect from falling objects such as trees as well as roll over • Gear blocking mechanism • Enclosed and pressurized cab where there are Africanized bees or high dust levels. Large rear view mirrors and preferably reversing camera.		LAND S5 S3-17
2.13a.16 In Vehicle Monitoring Systems (IVMS)	Vehicles should be equipped with IVMS (VDR), (as per reference document). IVMS data should be downloaded and reviewed at least weekly and where possible daily.		GENERAL S3 S3-12
2.13a.17 Vehicle Tracking System (VTS)	A vehicle tracking system (VTS) is recommended for all vehicles but is considered essential vehicles operating in high risk situations (as identified and agreed upon by client/contractor/subcontractor) which includes but is not limited to: • Remote areas • Areas requiring geo-fencing such as for: – Mine fields – Country frontiers – Protected areas – Military exercise areas. A VTS central system/operator to monitor crew vehicle journeys in real time.		GENERAL S3
2.13a.18 Speed limiting devices	The use of speed limiting devices on vehicles is strongly recommended, in particular for off road driving and long haul trips. Recommended speed limiting settings: • < 50 km/hr off road • < 80 km/hr for graded roads • < 110% of national speed limit for highways Automatic dual speed limiters can be used for combination of off road and graded road conditions.		GENERAL

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13a.19 Vehicle maintenance	Maintenance programme tied to hours/km on vehicle and manufacturer's recommendations should be in place including: • Vehicle log book/records • Daily inspection (signed off) by drivers • Defect reporting system and follow-up. Regular inspection by mechanic or manufacturer recognized service company.		GENERAL S3 S5
2.13a.20 Competent mechanics	Persons responsible for and carrying out vehicle maintenance: • Should be formally assessed as competent by the contractor • Recorded as such at their place of work (certificate and photo).		GENERAL
2.13a.21 Equipment	Adequate and appropriate tools, equipment and facilities should be available to allow for proper repair and maintenance of vehicles and their ancillary equipment. Suitable equipment and facility to be provided for inherently safe under the vehicle work and inspection.		GENERAL S5
2.13a.22 Records	Records of vehicle maintenance and repair should be kept including: Personnel carrying out such work Date and time Parts and consumable used Unique identifier for vehicle.		GENERAL
2.13a.23 Drivers selection, training and competence	Drivers should be minimum 21 years of age with 3 years of experience in the profession. Vehicles with more than 9 passengers should be driven by dedicated professional drivers. Drivers should have a valid driving license for the type of vehicle to be driven and to drive in that country. Drivers training and competence should be assessed and documented. Other checks to include: • Medical examination including an annual vision test • Character and background • Qualities and experience; document checks, driving tests, (theory and hands on) • Special skills such as terrain and climatic experience. Driver identity should be confirmed prior to each journey. Drivers should be rested and alert and do not operate any vehicle when fatigued.		GENERAL S3 S3-8 S3-9
2.13a.24 Driving permits and records	Driver records should be maintained, including: • Personal and employment details • Current photo of driver taken by contractor • Types of vehicle licensed to drive • Operating conditions (terrain) approved to drive • Types of cargo licensed to carry • Training received.		GENERAL S3 S5

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13a.25 Driver routines	Drivers should: At all times comply with the local traffic code and what they have been taught in their training. Not be under influence of alcohol, drugs or medication which could impair their fitness to drive. Refuse to drive if they do not feel sufficiently fit or rested to do so. Observe rest periods (every 2.5 hrs) and their maximum duty hours as per the reference. Avoid distractions and not make use of mobile telephones or other two way communication while their vehicle is in motion. Ensure their passengers use their seat belts. Perform daily inspection of their vehicle and report defects. For pick-up trucks or larger vehicles, walk around and inspect their vehicle before driving off. Be aware of the blind spots around their vehicle and avoid reversing; where they need to reverse large vehicles they should get the help of a banksman. Use wheel chocks when parking on slopes. Not allow third party passengers other than official crew visitors. Wear suitable footwear (flip flops and bare feet prohibited) Not leave their vehicle until the engine has been stopped, the handbrake firmly applied and the starter keys removed. Keys should not be left in a vehicle but kept by the driver or handed over to a responsible person. One track policy off road should be considered.		GENERAL S3 S5
2.13a.26 Driver induction and training	All drivers should be given Defensive Driving training in line with the references. Reassessment criteria are addressed in referred documents. Additional training as appropriate: • Off road driving • Use of GPS and radio or other means of communication • Adverse weather driving • Anti-skid training • Loading and load restraint for cargo truck drivers.		GENERAL S3 S3-11
2.13a.27 Driver performance monitoring and improvement	Drivers should be periodically re-assessed to identify deficiencies, analyse causes and select appropriate retraining including: • Review of IVMS and VTS data with drivers and crew management • Driving performance-monitoring records are maintained. Drivers are reminded of their personal duty to stop work includes their own physical condition, e.g. fatigue, illness etc., and any changes to it such as failing eye sight.		GENERAL S3 S3-3
2.13a.28 Passenger routines	Passengers should: • Use their seat belts • Place their luggage in the correct place (no loose objects) • Not distract the driver, rather assist him staying alert • Monitor driver behaviour and report near misses or incidents • Assist the driver as appropriate: respond to radio or phone calls, placement of wheel chocks, tyre changing, reversing, etc.		GENERAL
2.13a.29 Pedestrian vulnerability	High visibility reflective clothing or vests to be worn by all personnel outdoors on land operations. Maintain pedestrian traffic separation in camps and parking areas		GENERAL

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13a.30 Third party awareness of crew traffic risks	Briefings should be given to relevant third parties and local communities on land transport safety.		LAND S5
2.13a.31 Third party risk to project	Analysis of local driving habits and road conditions should be conducted to identify areas of caution and danger which should be mitigated where possible, and crew drivers and others should be adequately advised.		GENERAL
2.13a.32 Community vulnerability	Crew drivers should be made aware of the habits of local peoples where they could be particularly at risk , for example: • Children • Elderly • Persons, animals or places considered sacred by the local community • Lack of awareness of vehicle dangers.		GENERAL
2.13a.33 Journey management	Compliance with guidelines, requirements and practices in the reference document including a documented journey management procedure covering: • Road hazard identification • Country security risk profile • Driving after dark • Off-road driving • Journey reporting • Breakdown procedures • Convoy procedures • Documented limit to number of driving hours permitted in 24 hrs. (Ref S3 driving hours are related to long distance and black top driving. For off road conditions with low speed driving appropriate work/rest schedules should be established.) • Off duty travel to and from the crew. Such procedures may also include for example: • Marine administrators • Shore representatives, client/contractor/subcontractor • Suppliers • Crew persons driving home at crew change • Field managers may be included in Training requirements for journey management. Routine trips and camp field movements can be performed under simplified journey management procedure.		GENERAL S3 S3-2 S3-10 S5
2.13a.34 Special procedures	Contractor should have the following procedures as appropriate: • Dust cloud procedure • Adverse weather procedure • Vehicle brake down procedure • Tire change procedure • Convoy procedure • Towing procedure • Vehicle recovery procedure.		GENERAL S3-4
2.13a.35 Additional requirements for special vehicles and operations	Compliance with guidelines, requirements and practices in the reference document for. Appropriate training should be agreed for operators of special vehicles such as: • Snowmobiles • Vibrators • Tracked vehicles • Buggies • Small utility vehicles ('Mule', 'Rhino', etc.) • Fork lift trucks • Bulldozers, graders and front end loaders.		LAND S5

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13a.36 Slow speed vehicle incidents	Specific hazard analysis and risk assessment is required. Example risks: • Crushing • Running over • Movement of unmanned vehicles (e.g. no parking brake applied) • Parking on slopes or unconsolidated ground. Example controls: • Chocking blocks • Looking about vehicle • No reversing • Drive in drive out – one way system • Parking away from pedestrian areas (segregation in design) • Standard reversing alarm • Banks man for necessary reversing of large vehicles • Lighting of parking areas.		GENERAL M10
2.13b Water transport and operations (in land or TZ projects)			
2.13b.1 Compliance with local regulations	Water transport should comply with applicable local regulations. When local regulations are lacking, industry best practice should be followed. Self-regulation may be needed to achieve safe operations.		GENERAL S10
2.13b.2 Control by competence	There is a much larger variety of watercraft and waterways and operating conditions than there is for vehicle transport. Establishing clear and concise guidelines is therefore difficult. Operators should have to rely heavily on competence of the personnel involved in all respects including: • Risk assessment of all aspects of water transport and operations should be performed • Selection, design and equipment fit • Inventory • Operating procedures • Competency assessment, training and supervision of boat drivers. Note that for the same reason the key IOGP reference for the subject is structured as a generic hazards and control inventory.		GENERAL S10
2.13b.3 Inventory	There should be a comprehensive inventory of watercraft describing: • Type, number of units and allocation of units • Type of propulsion and fuel • Draft, length and width • Cruising and maximum speed • Autonomy with normal fuel capacity • Equipped with VTS • For carrying passengers • For accommodation • Crane and crane capacity • Radar • Passenger seating arrangement and maximum number of passengers • Cargo load limits • Minimum manning level and crew qualifications • Maintenance schedule.		GENERAL

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13b.4 Navigation area	Contractor should establish a hazard map of the navigation areas and waterways to be used, which apart from normal geographic and depth information should: • Indicate hazards such as: – (Submerged) obstacles – Underwater pipelines, cables and other utilities such as overhead powerlines – Current speeds and directions – Surf zones – Rapids – Sharp bends – Populated areas along the shores – Fishing nets – Powerlines and fence wire • Jetties, port, mooring and quay facilities • Refuelling and accommodation facilities • Speed limitations • Operating boundaries for the various types of craft.		GENERAL
2.13b.5 Design considerations	Hazard analysis and risk assessment of drowning should be conducted for all operations. (Note: Historically drowning shared the biggest percentage for fatalities with road transportation. Most of those fatalities were related to land operations, not marine.) The selection and design of small boats and watercraft used for geophysical operations should be in accordance with the relevant sections in the reference. Locally procured craft should be inspected by a competent person and where necessary upgraded to meet acceptable standards. Recommended hull construction materials are aluminium, steel, wood and fiberglass. Single hull Glass Reinforced Plastics (GRP) is prone to shatter on impact and should be avoided in areas where collision with objects is a risk. Double foam filled GRP hulls do not have this drawback. Small craft (without life rafts) should have suitable buoyancy built in to stay afloat (including their passengers) even if swamped with water. Larger craft and barges should have SOLAS approved life rafts and lifejackets at muster stations. Loading of barges should be subject to load and stability calculations.		GENERAL S10 S39 S40
2.13b.6 Equipment fit	Equipment fit should be in accordance with the recommendations in the reference. Key elements: • Dual propulsion if possible • Diesel engines preferred – inboard petrol engines strongly recommended against. • Fixed fuel tanks are preferred over portable ones • Railings or grab ropes around the craft, ladders for exiting the water • Protection against sun and rain for personnel as appropriate • Windscreen and wipers • Navigation and communication equipment • Dead man's switch on engine as appropriate • Navigation lights.		GENERAL S10 S5

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13b.7 General safety equipment	All small boats and watercraft should as a minimum comply with the equipment guideline in the reference document. All craft should have a means of communication with the base location.		GENERAL S10 S5
2.13b.8 Vessel tracking system	A tracking system is recommended to be installed on all small boats but is considered essential for watercraft operating in high risk situations (based on risk assessment). A VTS central system/operator to monitor and control crew journeys in real time.		GENERAL
2.13b.9 Small boat maintenance	Small boat and watercraft maintenance should be carried out in accordance with the reference and manufacturer's recommendations.		GENERAL S10
2.13b.10 Competence	All small boat drivers and crew should be competent for the type of craft they are operating in accordance with the reference. Boat drivers or crew should be able to perform common repairs on engines and craft such as: • Cleaning spark plugs • De-air fuel system • Replace damaged propellers • Fan belt replacement. In addition to ability to operate their craft, boat drivers should be familiar with the navigation area or be locally trained and given time to familiarize. Boat driver performance should be monitored by a competent supervisor.		GENERAL S2 S10 S29
2.13b.11 Driving permits and records	Driver and crew records should be maintained and should include: • Personal and employment details • Types of boats the coxswain is licensed to drive.		GENERAL
2.13b.12 Boat driver and crew driving hours	Contractor and Client should agree on maximum boat driver driving and working hours. The general recommendation is that these should be the same or less than the well documented driver duty hours for vehicles, taking into account that driving of small craft, especially speed boats can be much more strenuous than vehicle driving. Where regular rest stops (every 2.5 hrs) are not possible during the voyage, two drivers should alternate. Fatigue management and monitoring as for vehicle drivers.		GENERAL S3 H26 (see also above for vehicle drivers)
2.13b.13 Boat driver routines	Boat drivers should: • Ensure their passengers wear their PFD's as instructed and that they are fitted correctly • Control boarding and off boarding • Use Deadman's switch • Slow down and use audible warning signals for: – Blind angles – Other traffic as appropriate • Not engage in two way communication when driving at high speed • Follow Journey Management (JM) procedure • Regular rest stops (2.5 hours) • Ensure maximum number of passengers and cargo load is not exceeded • Ensure proper stowage of cargo • Not allow third party passengers. Boat drivers should not travel alone and have a competent helper on the craft. Boat driver helper should be able to use a spare Deadman cord, re-start the engine and recover the boat driver should he be MOB. Helper should be able to use the crafts' navigation and communication means.		GENERAL

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13b.14 Passenger routines	Passengers should: • Wear their PFD's • Follow boat driver instructions • Sit down in small transport craft • Assist the boat driver as appropriate • Keep their hands inboard • Spread out to balance the craft • Not smoke inside the craft.		GENERAL
2.13b.15 Drowning prevention	Drowning has been a major cause of fatal accidents in the geophysical industry. Essential preventive measures to be rigorously applied are: • Use of PFD's on any craft but also near water (e.g. jetties) • Training in the correct donning and wearing of specific PFD • Swim testing where appropriate • Not wearing heavy (rubber) boots in small craft as these make swimming extremely difficult • Life rings and quoits • Water exit ladders where egress from water is difficult, e.g. on jetties.		GENERAL M10 S10 S41
2.13b.16 Swim test	All exposed personnel to be swim tested with PFD before being exposed to shallow water or river operations. NOTE: This is not applicable to marine operations which are covered by the requirement for offshore safety and survival training.		LAND S5
2.13b.17 Journey management (JM)	All small boat and watercraft operations should be carried out in accordance with a Journey Management system. Operating guidelines to be followed and precautions to be taken are described in the references. The JM system should include a MOPO The crew should monitor a reliable weather forecast system and have a means to alert all craft in case of imminent adverse weather.		GENERAL S3 S3-2 S3-10 S5
2.13b.18 Restricted operations	Night time deployment of small craft should only be allowed in the event of an Emergency unless night time operations are contractually agreed. The latest permitted departure time should be defined and enforced to avoid night time operations.		GENERAL S5 S10

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.13b.19 Procedures	Documented procedures should be in place for water borne operations, creek and river crossing: • All crossing points are approved by crew management before use and clearly marked • Prohibition against water crossing alone • Prohibition against bathing in unauthorized areas • Swift water rescue plans • Required use of PFD whenever working near water. Procedures should be in place for controlling specific hazards, e.g.: • Refuelling • Anchoring • Towing • Traffic • Predators • Debris • Low hanging tree limbs or vegetation • Tides and currents • Shallow water • Blind corners • Overnight procedure in case destination cannot be reached in daylight. Emergency procedures: • MOB • Collision with other small craft • Smaller craft being swamped • Abandon ship for larger craft • Assistance to third parties • SAR • Small craft malfunction.		GENERAL S5 S10
2.13b.20 Airboat operations	Compliance with guidelines, requirements and practices in the reference document in particular the following: • All seats to be fitted with seat belts • Safety shroud around the propeller • Procedures in place for controlling unique hazards, (back wash from propeller, large wake, slow to come to a stop) • Wire catcher on the front of the craft in areas where fence wires may be encountered • Assessment of local hazards and level of risk for introducing airboat operations into new locations and different cultures. Airboats typically do not have built-in flotation.		GENERAL S5

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.14 Marine vessels: geophysical and support			
2.14.1 SOLAS and MARPOL	For all vessels engaged irrespective of size, the best practices of SOLAS and MARPOL are preferred. Where guidance in this document differs the most stringent should be applied.		MARINE S7 & E7 S10 S12 S53
2.14.2 Non mandatory vessels	Non-mandatory vessels under the tonnage requirements for IMO and ISM should be gap assessed against these standards, and applied as far as reasonably practicable, in agreement between client and contractor. Examples include: • Ability to communicate effectively with the seismic vessel • Basic recovery of MOB and able to demonstrate the use of the equipment • Minimum cruising speed of 6 knots.		MARINE S7 & E7 S12 Class requirements
2.14.3 Vessel design and certification	All vessels should be built and equipped to the requirements of a recognized and accepted international classification society and/or administration, and should have valid certification issued by this classification society and/or administration for the type and area of operation. All relevant certificates and ship documents should be available on the vessel.		MARINE Class requirements S7 S12
2.14.4 Small craft and special purpose craft design and certification	Such craft should be designed and constructed according to best practice under the control and acceptance of recognized and accepted technical authorities. Small craft and special purpose design craft only to be used for their intended purpose.		MARINE S2-1
2.14.5 Manning - competence	The vessel crew should be certified for the vessel class, size, area and type of operation., The flag state's minimum manning requirements should be fulfilled but does not take into account special activities such as geophysical operations where additional administrative and operations responsibilities apply to all the vessel operations. Client/contractor/subcontractor should contractually agree manning levels pertinent to the requirements of the project (use and risk based). This includes supply boats, workboats and Fast Rescue Crafts (FRCs).		MARINE Flag state requirements S7 S14
2.14.6 Automatic water tight doors	On vessels with automatic operating water tight doors: personnel should receive pertinent instructions about these within 24 hrs of boarding vessel.		MARINE
2.14.7 Emergency equipment/life-saving appliances - general	The vessel(s) should be appropriately equipped for its class with life-saving appliances complying with the references. All emergency equipment on-board should be maintained in a state of readiness at all times. For vessels, the following tests should be considered: • All fire-fighting monitors tested once per month (or weekly if the vessel has a specific fire-fighting role) • Life-raft and release units serviced annually • Fast rescue craft/lifeboats launched and tested at least once per month • Fire pumps run at least weekly. All periodic inspections and tests should be performed per schedule by recognized service companies. The relevant personnel on-board should be trained in its use.		MARINE Class requirement S7 S11 S14

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.14.8 Life rafts	Where not required by the reference the life raft capacity on either one side of the vessel should be sufficient to accommodate the total number of persons on board. For smaller boats where it is not possible to mount two or more life rafts the minimum allowable life raft capacity is 150% of the maximum permitted persons on board. All life rafts are to be fitted with hydrostatic releases. Where shallow water operations preclude guaranteed action of hydrostatic releases a more appropriate method of float free operation should be provided. An emergency MOB life raft should be located and releasable from the back deck.		MARINE S7
2.14.9 Survival craft	In cold-water and remote areas rigid hulled life boat(s) i.e. the Totally Enclosed Motor Propelled Survival Craft (TEMPSC) are preferred.		MARINE S7
2.14.10 Abandon ship Life-jackets	Life-jackets are to be provided for a minimum of 200% of the total number of berths on board and should be placed as to be readily accessible in domestic areas, the work place and muster points. The life-jackets' position and donning instructions should be clearly displayed. Wherever possible it is preferred for 100% of life-jackets to be available on open deck.		MARINE S7 S6
2.14.11 Integrated Survival System	Life-jackets can be integrated as part of an ISS when working in cold climates, includes three unique components: • Personal Flotation Device (PFD) according to SOLAS dual chamber standard with minimum 275nm buoyancy • Personal Locator Beacon (PLB) • Personal Protection Equipment (PPE). PLBs should be fitted to life-jackets whenever there is a risk of personnel falling overboard from a vessel or workboat.		MARINE S41
2.14.12 Survival suits (with insulation)	Where operational conditions demand their use, the vessel should be equipped with survival suits of appropriate sizes for all persons on board. The survival suits should be readily accessible and their position and donning instructions should be clearly displayed. Of the 200% abandon ship life-jackets, survival suits that have a built-in PFD (which meet the requirements of an abandon ship life-jacket expressed by the LSA Code) may account for up to 100% of the abandon ship life-jackets in cold climates.		MARINE S7 S56
2.14.13 Smoke hoods	Based on risk assessment, smoke hoods should be provided in cabins and workspaces where immediate egress is not available. Donning instructions should be clearly displayed. Light sticks can be provided as an aid.		MARINE
2.14.14 Safety harnesses	Safety harnesses approved to suitable standards should be provided for personnel working in areas where there is a danger of them either falling or being dragged overboard. The harnesses should have suitably positioned, safe and load tested attachment points. Integrated PFD and harness, or PFD with attachment point for fall arrestors, should be considered. A robust regime of inspection and maintenance should be in place. Harnesses consisting of a single waist belt should not be used.		MARINE S6

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.14.15 Fixed fire detection and protection system	The preferred type of fixed fire detection system is a 'self-monitoring type' (i.e. has a fail-safe mode in the event of component failure). High pressure water mist fire protection systems are preferred in engine areas.		MARINE
2.14.16 Transfer of personnel at sea	The need and circumstances for transfer of personnel at sea should be contractually agreed. Documented procedures should be in place and transfer should only go ahead after a specific risk assessment prior to transfer, and after the Captain has approved. The consent of the person transferring should also be obtained. Such transfers should comply with local regulations. The use of a suitably designed embarkation platform or gangway can be considered.		MARINE S6 S54
2.14.17 Basket transfers	Basket transfers are not recommended and should only be conducted if contractually agreed, risk assessed and controls in place including, but not limited to: • Consent from all participants • Good visibility & daylight • MOPO for weather and sea conditions • Crane approved for personnel transfer • Basket should be designed and approved for personnel transfer • Use of best available technology • Training for personnel in basket riding including baggage handling and positioning and behaviour of personnel • A basket transfer test could be carried out at mobilization start, if agreed by all parties.		MARINE S6
2.14.18 Loading/offloading	Documented procedures should be in place for offloading/loading at main vessel (offshore) or at quayside, to include but not limited to: • Data • Provisions • Technical equipment • Fuel • Containers/Remotely Operated Vehicles (ROV).		MARINE S6
2.14.19 Support and escort vessel management	Support vessels need to be provided with full set of relevant project documentation and procedures, and receive project induction briefing from contractor management. Documented procedures and formal risk assessment should be in place for: • Mobilizing and recovery non-standard heavy equipment, streamer reels, AUVs etc. • TS-Dip operations • Recovery of equipment lost at sea • Alongside operations • Emergency tow • Bunkering • Workboat support • Third party engagement • Debris removal • Independent operations • Man overboard location and recovery.		MARINE S53

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.14.20 Bunkering	Procedures should be in place for bunkering, including: • Fuel quality (control and testing) • Spill containment • Fuel transfer method (in-line, alongside) • Fuel hose fitted with automatic shutoff couplings (e.g. TODO, Breakaway) • Use of tested and certified connectors and fittings to ensure compatibility • Fuel hose subject to pre-use inspections • Spill response plan.		MARINE
2.14.21 Close pass operations or when otherwise entering safety zones	Project plan should include a risk assessment and identify procedures for entering the safety zone. SIMOPS and platform liaison document should be developed which may include, but not be limited to, the following: • PTW protocol – vessel may work under PTW system of third party • Safety zone is clearly established • Communication protocols between the parties are agreed upon • Closest approach permitted for vessel and towed equipment given specific metocean conditions • Pre-entry checks required • Ship's Bridge & Engine room manning criteria • Operational readiness status of auxiliary equipment required • Diving, sub-sea ROV, working overboard and helicopter operations • Pre-entry radio checks and final permission • Ban on emergency drills • Radio silence controls agreed • Emergency tow on standby • Spark arrestors • Specified in the MOPO.		MARINE S6 S19 S23 S25
2.14.22 Multi vessel operations – Ocean Bottom Cable (OBC), Ocean Bottom Node (OBN), Wide Azimuth (WAZ), etc.	In multi vessel operations a single control point for overall vessel movement should be established. A dedicated communications coordinator may be required.		MARINE S6
2.14.23 Collision risk management	Mitigation measures for detecting threats and preventing collision includes: • Agreed vessel suitability and acceptance process implemented for all vessels • Approved extended safe navigation area • Client's maritime instructions in the area implemented by Contractor • Close passes and undershooting controls approved by Client where applicable • Advanced communication to interested parties of projected work area • Collision detection, e.g. visual lookout, use of stand-by vessels, radar, hybrid radar, Automatic Identification Systems (AIS) including on the outer tail buoys or a combination of these commensurate to the density of the collision threats • Means of communication including but not limited to contact details from all field units in the SIMOPS plan, Global Maritime Distress and Safety System (GMDSS) procedures, searchlights and sirens, coastguard • Contingency plans including emergency towing.		MARINE S16 S42 S43

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.14.24 Emergency towing	The requirements for emergency tow vessel(s) should be contractually agreed between client and contractor to mitigate any seismic vessel's loss of propulsion. Emergency towing requirements should consider the seismic vessel's Redundant Propulsion (RP) Class Notation and Failure Modes and Effects Analysis (FMEA). RP and RPS (RP with Separation) Class vessels with additional qualifier (+) operating in open waters may be exempted from certain emergency towing requirements. Qualifier (+) may be assigned to both RP and RPS notations when it is verified that the vessels propulsion and steering system is of a redundant design. Contractor should define the conditions and frequency for emergency tow drills. When emergency tow capacity is required to mitigate a seismic vessel's loss of propulsion, emergency tow vessel(s) should: • Conduct a tow test at the start of the project prior to streamer deployment, or whenever a tow vessel is replaced • Have a fit-for-purpose and certified bollard pull to maintain the seismic vessel and in-sea equipment, at a water speed of at least 3 knots • Have fit-for-purpose and certified back deck equipment including emergency release • Be manned by officers experienced in towing operations. Vessels-specific work instructions and risk assessment should be approved by both captains. Streamer vessel should have an emergency release with a preference for remote operated towing line cutting tool.		MARINE S57
2.14.25 Dynamically positioned (DP) vessels	Operations with DP vessels should be in compliance with the reference document.		S17
2.14.26 Marine operations in arctic waters	Arctic operations should be in compliance with the reference document.		S55
2.15 Back deck marine operations: geophysical and support			
2.15.1 Working environment	Working areas should be designed and maintained to achieve: • Protection from adverse weather • Safe and secure footing for those working there • Effective communications between back deck, ship's bridge and Instrument room. • Acceptable noise levels • Adequate levels of lighting • Deck markings reference PPE requirements. In addition: • Appropriate PPE – wet/cold weather wear should be available • Should they exist, areas of high noise should be clearly identified, marked with warning signs and appropriate PPE provided • Deck areas should be maintained, clean and kept free from obstructions • Equipment and stores should be securely shored up to prevent movement in rough weather.		MARINE S6 H2 S53

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.15.2 Back deck fire prevention, detection, protection	Back deck fire prevention measures should include but not limited to: • Identification of where smoking is permitted • PTW for hot-work on back deck • Provision of smoke/heat detection system in high risk areas • Appropriate deluge systems should be installed over high risk areas (e.g. streamers) • Provision for dealing with lithium fires.		MARINE M3 S6
2.15.3 Edge protection from falls	Suitable railing around work deck areas. Use of fall arrestors when operating in open slip-ways or over railings – signed appropriately. Provision of written fall protection plan where appropriate. MOB Alarm interfaced with energy source. On an airgun slipway, the safety harness should be attached to a self-retracting lifeline, with a maximum length that would keep a person on the slipway.		MARINE S6
2.15.4 Lone Worker	A person should not work alone on the back deck without supervisor approval.		MARINE
2.15.5 Protection from dynamic loads	The risk of injury from dynamic loads should be reduced by use of the following but not limited to: • Design of deck to minimize exposure • Restricted access areas • Minimize exposure for authorized personnel in the line of fire or snap-back zones • Clear access-ways with adequate width; • Correct use of wires/ropes • Utilization of MOPO.		MARINE M3 S6 S20
2.15.6 Protection from rotating/moving equipment	The risk of injury from rotating/moving equipment should be reduced by use of the following but not limited to: • Design of deck to minimise exposure • Restricted access areas • Clear access-ways with adequate width • Guarding on rotating and moving machinery parts • Barriers to moving equipment • Emergency stop devices for machinery and conveyor belts • Certification of equipment and machinery according to manufacturer specifications • Defined maintenance and inspection requirements • Procedure to restrict the use of loose clothing, loose long hair, and jewellery while working to protect personnel from getting caught up in machinery • Operating procedures and training for operators.		MARINE M3 S6
2.15.7 Protection from electrocution	All power to be removed from streamer when disconnecting or connecting sections		MARINE S6 M8

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.15.8 Portable equipment/hand tools	Use of battery operated or low voltage tools with transformer isolated supply preferred. Strongly recommended to use residual current circuit breakers (RCCB) on utility outlets used in wet areas, where practical. Double insulated if higher voltage. Preventative maintenance required and a system of recorded portable appliance testing recommended. Pneumatic tools preferred to electric where no additional exposure is introduced. Whip checks to be available for hoses on pneumatic tools.		MARINE M3 S6
2.15.9 Emergency response – equipment, communications	Strong emphasis on protection against a person falling overboard including, but not limited to: • Safe working practices • Matrix of Permitted Operations (MOPO) • Barriers • Life lines. MOPO should define the sea state and other conditions which operations are not permitted. These conditions should be regularly checked. As a minimum, the following should be in place in all areas and activities where there is a risk of falling overboard: • Wearing of automatic inflating life-jackets with reflective material and water activated lights • Personal locator beacons • Vinyl dip work vests should not be used. In case of man overboard: • Marker buoys, light rings and other such devices that can be thrown overboard to aid person in water and mark their location • Emergency life raft should be releasable from back decks • Established communications devices readily available to personnel on back deck • Video monitoring of key working areas of back deck by ship's bridge and instrument room • MoB alarm.		MARINE S6
2.15.10 Certification/testing of load bearing equipment	Winches, booms, cranes, wires, chains, cables, straps, tie down points, pad-eyes and devices subject to proof load test and maintained under survey.		MARINE
2.15.11 Defined procedures for HSE critical operations, limitations on back deck operations	Procedures for recovery, deployment to include a table defining limits for operations as affected by natural phenomena and simultaneous operations. A specific MOPO or to be included in the vessel or Crew MOPO.		MARINE S6
2.15.12 Housekeeping - good seamanship	Minimization of slip/trip hazards. Proper stowage of equipment. Equipment tied down in adverse weather.		MARINE S6
2.15.13 Environmental protection	No waste to be thrown overboard. Streamer and umbilical fluid should drain to tanks and not over the side. Spills kit to be available on back deck with personnel trained in its use. Small items including waste are not allowed to be left loose on deck (e.g. spent tape, tie wraps, plastics, etc.).		MARINE M3 S6 E7

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.15.14 Streamer tangle	The size of the streamers configuration should be balanced with the capabilities of the seismic vessel, in order to reduce the risks of: • Collision with assets or ship traffic • Streamer tangle and the subsequent HSE exposure in the recovery of in-sea equipment. This evaluation should encompass the: • Redundancy • Electrical and propulsion power capacity • Spare tow points and winches for recovery • Environmental conditions including prevailing weather, sea state, barnacle growth, currents. Any non-routine equipment recovery should be subject to a risk assessment and appropriate approval process.		MARINE
2.16 Workboat operations			
2.16.1 General operations	Operational planning and execution should be carried out in accordance with reference and related guidance in this document.		MARINE S2 S2-1 S2-2 S6
2.16.2 Specific training requirements	All workboat crew should have undergone Training in the operation of the particular workboat type and specific in-water repair operation. Contractor may include one trainee in the workboat crew when it's a documented aspect of the contractor's training programme.		MARINE M3 S6 S29
2.16.3 Workboat launch toolbox meetings	Toolbox meetings should always be conducted prior to launch of workboats for in-water repair at which time a risk assessment of the specific operation should be carried out.		MARINE
2.16.4 Specific hazards associated with streamer and in-water equipment and repairs	Risks associated with workboat operations should be assessed as part of procedure development, highlighted at pre-launch meetings and operations, to include: • Dangers of being towed by streamer • Integrity of section changing hardware • Ergonomics of handling equipment over side of small boat • Isolation of streamer power • Tangling with surfaced streamers • Navigation of small boat relative to the streamer not the vessel(s) • Support/auxiliary vessel safety when they take equipment in tow (tangling props etc.) • Boarding of in-water gear • Fire risks (e.g. lithium batteries) • Quick releases of equipment • Visibility and adverse weather • Dangers of in-water flora/fauna • Duration and scope of task to manage fatigue including the effects of sun/salt/heat/cold on boat crew.		MARINE S6

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.16.5 In-water repair procedures	Workboat operations should be permitted only where procedures have been specified and validated in exercises. Workboat crew should wear Personal Locators Beacons (PLB). Main and support vessels should have the necessary direction finders for the PLBs in use		MARINE S6
2.16.6 MOPO for workboat operations identifying prohibited jobs, including during helicopter operations	A MOPO or matrix summary should be developed for in-water maintenance jobs using workboats. Such a MOPO for example would not permit in-water maintenance on the following: • Air gun arrays • Lead-ins • Doors, paravanes, pullavanes. Personnel should not be allowed to disembark from the workboat onto tail buoys.		MARINE S2 S2-1 S2-2 S6
2.16.7 Management of change	If the scope of the repair operations does change significantly, the workboat should return to the mother vessel where a risk assessment for the new operation should be carried out.		MARINE M1
2.16.8 Emergency planning for workboat operations	In the event that extensive in-water maintenance work is envisaged using workboats (e.g. 3D multi streamer operations), the following should be required. A full time support vessel should act as a rescue craft to be stationed in close proximity to the workboat while performing in-water maintenance jobs. The support vessel should be equipped to recover personnel from the water (e.g. scoop or cradle).		MARINE M3 S2 S2-1 S2-2 S6
2.16.9 PPE	Minimum PPE requirements are: • Automatic inflating dual chamber lifejacket • PLB • Steel-toed shoes • Marine rescue helmet with chin strap • Coveralls or survival suits depending upon water temperature • Safety glasses • Gloves.		MARINE
2.16.10 Fast Rescue Craft (FRC)	A rescue craft with competent crew should be readily available for launching: • Water jet propulsion is preferred • Rigid hull preferred • Diesel powered (inboard petrol power engines are not acceptable) • Minimum manning levels established • Craft to be unsinkable and fitted with manually operated self-righting system.		MARINE S7

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.17 Air transport			
2.17.1 Air operations - procedures	Air operation(s) should be in compliance with the relevant guidelines, requirements and practices in the reference documents.		GENERAL S1 S8 S13 S44
2.17.2 Audit of air operations	A competent aviation expert should conduct an independent audit of the aircraft operator, personnel and equipment, before the start of operations (by client or contractor).		GENERAL S1
2.17.3 Helicopter selection	Helicopters should be fit for purpose. Offshore, there is a preference for: • Helicopters that are fitted with flotation devices that are automatically deployable • Helicopters that are equipped with push out windows for passengers • Helicopters which are equipped with Emergency Breathing Systems (EBS).		GENERAL
2.17.4 Helicopter decks	Requirements for and availability of helicopter landing decks should be contractually agreed. Requirements and conditions include but are not limited to: • The helideck crew, HLO, helideck assistants, and fire fighters, are suitably trained and experienced, this should include helideck fire-fighting training. • The entire helideck crew should have exercised together before the first helicopter operation. This should include proof that the fire-fighting equipment has been tested and is fully serviceable. • The helideck fire-fighting system should be fit for purpose and have sufficient coverage of fire-fighting systems and equipment. • The helideck should be certified for the largest size and weight of aircraft expected to be used. • The helideck friction should meet the environment and equipment to be used. If this includes a net it should be installed and appropriate for the aircraft using the helideck. • If re-fuelling is to be carried out, the equipment is certified and the nominated crew competent to use it. • A working inspection programme for the helideck should be in place that includes pre-arrival and departure helicopter checks, routine facility audits by the operator of the facility and the aircraft operator. • The vessel should have procedures for helicopter operations; these procedures should include all elements list above and detailed passenger handling instructions, and formal passenger safety briefing procedures. • Weather and deck heave monitoring available. • During offshore helicopter operations, a FRC should be in stand-by ready for immediate deployment.		MARINE S13 S45

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.17.5 Helicopter landing zones (LZ)	Requirements for and availability of helicopter landing zones should be contractually agreed and planned in advance as the logistics involved in clearing them can take some preparation. Sections 6 and 7 of the reference contain more in-depth guidance for LZ construction. Requirements and conditions include but are not limited to: • The LZ should be clear of all hazards and have the dimensions to allow the working helicopter to land and to manoeuvre (take-off and landing) without problems. A take-off and landing path should be considered as well as the prevalent wind direction. • The area of the Landing Zone should be sufficient and appropriate for the largest size and weight of aircraft expected to be used. • No loose objects left in a landing zone (clothing, garbage, tarps, etc.) • If re-fuelling is to be carried out, the equipment should be certified and the nominated crew competent to use it. • A working inspection programme for the LZ should be in place. For remote locations, the LZ should need to be maintained and cleared at a designated frequency. • Frequently used LZ should have wind direction indicators such as windsocks. • LZ should be clearly identified prior to an operation and coordinates to this LZ should be, in some cases, provided to emergency services or be kept in a central location where coordinates of these sites are readily available. • In the case of an LZ in tree canopy, the gap in the canopy, should reflect the gap on the ground: a recommended LZ area is 35 m by 35 m. This area should be cleared in the canopy. • If LZ is used to embark/disembark passengers, a clear path to and from the aircraft should be outlined and communicated to all passengers to avoid accidental walking into the tail rotor. All passengers should exit and approach the aircraft in clear and direct view from the pilot. • If the LZ is to be fitted with re-fuelling stations, proper equipment and firefighting capabilities should be present. • If LZ is also used for overnight maintenance, the LZ should be properly fitted with sufficient lighting. • Where aircraft need to be washed with water and soap regularly, a system (berm and grease traps, etc.) should be built around the pad to collect biodegradable soaps/oils. • The pilot has the ultimate word on accepting or rejecting an LZ site.		LAND S8
2.17.6 Fast Rescue Craft (FRC)	A rescue craft with competent crew should be readily available for immediate launching whilst helicopter operations are taking place.		MARINE S7
2.18 Camps and field workshops			
2.18.1 Camp sites selection, construction and layout	Compliance with the references		LAND S31 S32
2.18.2 Electrical	A competent person should be identified as responsible for all electrical aspects on the crew. Client/contractor/subcontractor should mutually agree on applicable standards. Compliance with guidelines, requirements and practices in the reference document.		LAND S5 S6 S32

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.18.3 HP air, water and hydraulic systems	Procedures should be in place, which include but not limited to the following controls: • Competent personnel • Designated area with warning signs • Hose connections, fan belts and pulleys protected/cleated • Inspection/maintenance programmes • Unattended machinery to be checked at a specified interval during operations • Unattended machinery should be provided with comprehensive alarm and shutdown devices that are periodically checked for effectiveness • HP hoses and piping to be certified to a safe working pressure that reflects the maximum that may develop in the system • Over pressure relief valves are installed • HP piping to be screened where practical where personnel may be at risk • Periodic (defined period) testing by competent authority • LOTO procedures utilized during maintenance.		LAND S5 S6 M3
2.18.4 Battery charging	Battery charging procedures should be in place, which include the following controls: • Designated, suitable separate area • Area well ventilated • Smoking prohibited • Appropriate PPE available (face shield, apron, gloves, rubber mats) • Eye-wash station • Fire-fighting equipment • Training requirements • Monitoring, control and recovery measure for battery (including lithium) failure.		LAND S5 S6
2.18.5 Fuel transfer or storage	Procedures should be in place, made available to both receiving and supplying parties, which include the following controls: • Storage and fuelling operations should be above the high water mark of any body of water and an adequate distance from water sources (e.g. ponds, rivers creeks) to avoid possibility of hydrocarbon pollution • Designated area(s) • Electrical equipment within the hazardous area to be suitable for the purpose and intrinsically safe • Fuel hoses with automatic shut-off valves • Spill prevention plan and containment equipment (secondary containment/drip pans) to avoid environmental incidents • Oil spill consumables and equipment ready to handle any oil spill incident • Separation of hazardous areas • High visibility warning signs • Appropriate fire-fighting equipment positioned within 15 m of pumps or dispensers • Only approved fuel tankers to be used • Tankers adequately grounded during fuel transfers • Appropriate PPE • Designated and trained fueler should be present during fuelling operations. Berms with a minimum 110% containment should be provided on all fuel storage, with the exception of steel road tankers. The latter should have a close off valve directly on the tank itself, which should be closed at all times when fuel is not being dispensed and drip containment in place. Note: berm (containment arrangement) should take into account rainwater contribution where appropriate.		LAND S5 S6 S32 E6

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.18.6 Fuelling operations	Procedures should be in place for fuel handing, including: • Fuel quality (control and testing) • Fuel storage (including spill containment) • Fuel transport • Spill prevention plan • Refuelling • Record of competent persons authorized to carry out fuelling operations.		LAND S5 S6 E6
2.18.7 Compressed gases	Procedures should be place for compressed gases, including: • Segregation • Safe distances • Hydrostatic testing • Labelling • Storage • Handing • Non return valves and flash back arrestors should be used on Oxygen and Acetylene gas bottles.		LAND S5 S6
2.18.8 Maintenance facilities	Where vehicles and equipment are maintained in camp a hardstand and sheltered area should be provided for this work. A safe and practical method of under vehicle work/inspection should be provided. Inspection pits should be properly constructed to be safe.		LAND
2.19 Security (land and marine)			
2.19.1 Assessment	During tender phase, client should provide contractor with client's initial risk assessment, or hazard list. The assigned responsibilities and resources should be contractually agreed. Before the project start-up, the security of the operation should be assessed or re-assessed in the event of changing conditions. In marine operations the Company Security Officer (CSO) should ensure that the vessel is fully aware of any raised ISPS security level (2 or 3) in the area of operation and that any additional controls are in place. Contractor should have a single focal point for local security.		GENERAL SEC4 SEC6 SEC8 SEC9 SEC11 SEC12
2.19.2 Procedures	Security procedures should be in place covering a range of situations including: • Assault • Robbery/theft • Abduction/missing persons • Threats by telephone • Cargo/baggage integrity • Vandalism/sabotage • War/terrorism/piracy • Civil disobedience/strikes • Guarding of camp • Temporary local workforce • Cyber security • Security response and communication. In marine operations, client /contractor/subcontractor should agree on security arrangements even if vessels do not fall under ISPS requirements and/or non-ISPS certified ports are contemplated.		GENERAL SEC2 SEC3 SEC4 SEC5 SEC10 M11

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.19.3 Personal awareness	Personnel involved in the project to be trained in basic preventive measures to reduce potential security incidents. Where assessment identifies a security risk to personnel, guidance should be provided on appropriate behaviour in the event of a security Incident. A policy of 'no resistance' is recommended. Limit cash and valuables and maintain secrecy about cash transfers/transport		GENERAL SEC1 SEC2 SEC3 SEC4 SEC5
2.19.4 Potentially aggressive interference or intervention by third parties to the project	Identify, assess and document the risks that exist from third party activists. Document the procedures that are to be followed, which might include: • Interference with vessels/vehicles/ equipment by a third party • Radio contact from a suspicious third party • Third party puts themselves or crew members in danger • Third party shows aggression towards the crew personnel • Third party attempts to take possession of crew property.		GENERAL SEC1 SEC2 SEC3 SEC5 SEC6 SEC11
2.19.5 Social media	Provide policy and instructions on the use of social media.		GENERAL M3
2.20 Survey and line operations			
2.20.1 Surveying / Line Clearance	Client and contractor/subcontractor should mutually agree on the necessity and scope of line clearance activities and perform a risk assessment. Surveyors should identify hazardous areas and indicate them on line maps to assist subsequent operations. Line markings should be recovered, reused or recycled where possible, and biodegradable materials should be used where available. Compliance with guidelines, requirements and practices in the line clearing reference document(s), addressing: • Brush cutting with hand tools or light powered tools • Line clearance machinery (including bulldozers, mulchers, hydro-axes and back-hoes) • Tree felling and chain saw operations • Bridging.		LAND S5 S46 S47 S48
2.20.2 Steep Slopes	If working on steep slopes, a comprehensive set of procedures should be developed which includes: • The use of specialists (mountaineers) for very steep terrain • Training of personnel on techniques for working on slopes • Medevac preparations adapted to terrain, e.g. helicopters with winches for evacuation, drop zones and specific training for personnel; • Use of a zoning system, e.g. 'no go', 'mountaineers only', 'supported by mountaineers', etc. PPE for working on slopes including boots with ankle support and proper non-slip soles. Helmets should be mountaineering helmets which also provide head protection during a fall.		LAND S49

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.20.3 Risk from falling objects	Recognition of risks from falling objects to include but not limited to: Chain saw operations: • Falling trees • Falling branches • Dead and insecure trees and limbs not actually being cut. Line clearing: • Insect habitats, e.g. wasp or bee hives • Falling creatures, e.g. snakes and spiders • Leaning and dead trees • Dead branches. Heli-portable operations: • External loads.		LAND S5 S50
2.21 Shot hole drilling			
2.21.1 Drill unit resources: type, selection, and design	An assessment should be available for the required drill units, which should cover the lithology, terrain, required depth and ergonomics.		LAND S5
2.21.2 Safety equipment for drill/ramming units	Compliance with manufacturers' recommendations and guidelines, requirements and practices in the reference document. In addition, adequate measures are to be taken to avoid injuries from rotating drill stem (cages, emergency stop, interlocks). Jewellery policy should be in place. PPE should take into account the need to wear tightly fitted clothing to reduce the potential of being snagged. Rotation shall be stopped for clamp/pipe cleaning. Prefer hold-to-run rotation controls on drilling units, mandatory for auger drilling. Ensure emergency switches are easy to reach and actually stop the hydraulic, not only the engine. Identify solutions to provide protection from rotating parts e.g.: • Cage around rotation head and rod to prevent access to moving parts • Implementation of an interlock when the cage is opened • Inside the cage, use of sensitive protective devices to control the residual risk.		LAND S5
2.21.3 Maintenance	Compliance with manufacturers' recommendations and guidelines, requirements and practices in the reference document.		LAND S5
2.21.4 Operators competence and selection	Perform an assessment in line with reference document of drilling operator experience, skill, training and understanding on the specific unit(s) used. All drill crew personnel to be made aware of the hazards related to: • Overhead power lines • Explosives • Buried objects.		LAND M3 S5
2.21.5 Heli-portable drilling loadmasters	Heli-portable drilling operators should be trained as helicopter loadmasters to the acceptance of the helicopter operator.		LAND M3 S1 S5 S8

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.21.6 Operational procedures, for different types of drilling units	Procedures should be in place for the specific drill units being used, which are in compliance with guidelines, requirements and practices in the reference document: • Truck mounted drills • Buggy mounted drills • Airboat mounted drills • Marsh buggy mounted drills • Ramming rigs • Heli-portable drills • Man-portable drills.		LAND S1 S5 E6
2.21.7 Clean up, move up	Hazards should be managed such as: • Flowing hole/artesian well • Contact between fresh and salt water aquifers • Loss of water through drilled holes in irrigated land. Compliance with guidelines, requirements and practices in the reference document.		LAND S5 E6
2.21.8 Ground disturbance	Procedures should be in place to: • Locate and map buried objects such as pipelines, underground power lines, etc. • Ensure safe passage across underground utilities, including the construction of temporary ramps • What to do if unknown object encountered.		LAND
2.22 Explosives			
2.22.1 Planning	The relevant laws governing the storage, transportation and use of explosives in geophysical operations are known, available on the crew and should be complied with.		LAND S5 S51
2.22.2 Supervision	Supervisors responsible for operations where explosives are used should meet the competencies defined in the reference.		LAND M3 S5
2.22.3 Personnel	All personnel handing explosives should be qualified, licensed (where required) and certified as competent to perform the allotted explosives handling jobs.		LAND M3 S5
2.22.4 Offsets	Agree safety distance to private/public buildings and archaeological sites based on peak particle velocity (PPV) measurements and implement active monitoring with post acquisition inspection if appropriate. Source locations should be planned to conform to the largest distance requirements stated in relevant local regulation or the reference document for shot to object (e.g. pipelines, buildings).		LAND S5 E9 E10
2.22.5 Proximity of radio emissions	The measures including safety distances for the prevention of unplanned detonation of electric detonators by radio frequency radiation (including radar) should meet the recommendations in the reference.		LAND S5 S22 E9 E10

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.22.6 Type	Criteria of choice includes, amongst others: • Avoid nitro-glycerine based products (more hazardous, adverse health effects) • Buoyancy (buoyant charges may be a problem) • Self-destruction time (in case of misfire or loss) • Type of packaging, feasibility of using anchor plugs • Self-destructing products are recommended • Electronic detonators are recommended both for safety and security reasons • Where practical, the use of double detonators is recommended where abandoning misfires is considered unacceptable or not allowed by the regulators.		LAND S5 E6
2.22.7 Explosives packaging	Explosives packaging should be securely stored until disposed of, so that is cannot be stolen by malicious elements. To be disposed of by controlled burning.		LAND
2.22.8 Unused Explosives	Procedures should be in place for disposal of explosives in coordination with the manufacturer and/or suppliers and in accordance with IME practices.		LAND
2.22.9 Transportation - land, water, air	Procedures should be in place for explosives transportation (land, water and air), as per reference documents		LAND S1 S5 S8 S15
2.22.10 Storage distances	The distances of explosives storage facilities from other structures, buildings and infrastructure and should meet the recommendations as stated in the reference.		LAND S5 E9 E10
2.22.11 Storage	Storage of explosives should comply with local regulations. Area to be kept clean		LAND S5
2.22.12 Storage management	Only competent personnel should be made responsible for the control of explosive inventories. Key control.		LAND M3 S5
2.22.13 Storage – locations See "Storage distances" above	Explosives storage location(s) should be: • At safe distances from occupied places • In areas clear of any combustible material for at least 15 m.		LAND S5 E9 E10
2.22.14 Magazines	Explosives magazines should comply with the following: • Be of sound construction according to the local regulations or IME guideline • Efficient lightning protection • The use of active (ionizing chamber) lightning conductor(s) is not recommended, their effectiveness is not considered proven • Adequate earthing • Controlled access and adequate security • Temperature extremes controlled • Adequate ventilation around explosives • Magazines on barges should take into account load distribution to prevent capsizing.		LAND S5 S21 S51

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.22.15 Temporary field storage	Temporary storage facilities for explosives in the field should have: • Adequate security (including secured for unauthorized removal) • Adequate weather protection • Adequate ventilation • Up to date inventory.		LAND S5 E9 E10
2.22.16 Separation from other materials	Explosives to be stored in isolation from other materials. Detonators always stored away from explosives.		LAND S5 E9
2.22.17 Shot hole loading	Compliance with guidelines, requirements and practices in the reference document. Multiple charges at various depths in a single hole are not recommended. If required should only be considered where knowledge of the near surface, the small size of charge, separation and tamping practice gives confidence that the risk of blow out is avoided. Procedures for priming and loading should always ensure only a minimum number of operators are exposed, for a minimum duration.		LAND S5
2.22.18 Shot firing	Compliance with guidelines, requirements and practices in the reference document. Delayed blow-outs procedures providing minimum approach times after shot initiation has commenced. This should never be less than one minute, and a wait of at least 15 minutes is recommended for electrical detonators, and 30 minutes for electronic detonators. Multiple firing lines are not permitted. A blaster should only use a single firing line. Firing lines should be anchored, when warranted, to avoid being blow out in the direction of other hazards. Adequate firing line length should be of a minimum of 30 m or 100 ft.		LAND S5
2.22.19 Disposal	Procedures should be in place for disposal of explosives in coordination with the manufacturer and/or supplier. International and local legal requirements should be complied with Packing should be burned in field and not re-used.		LAND
2.22.20 Abandoning misfires	Procedures for handling abandoned charges should be mutually agreed upon by client and contractor during the bidding stage. Basic requirements for abandoning a misfired charge include but are not limited to: • The detonator lead wires should be cut and placed in the drill hole as deep as possible beneath the surface • The surface should be covered with drill cuttings • The contractor should keep a permanent record of the misfire, including information on the location, explosive type, size and depth • If required, reports should be submitted to appropriate regulatory agencies. The following practices are not recommended but may be required by local regulations in some jurisdictions: • Sympathetic detonation (re-entry or drilling near-by) • Attempts to retrieve the misfired charge (assess erosion and area activities) • Surface identification or monumenting of abandoned charges to prevent unlawful recovery.		LAND S5 E6

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.23 Vibroseis			
2.23.1 Training	Operator and mechanic training to be conducted so that personnel are aware of the fatal risk of crushing • No approach to vibrator without notifying the driver • If approach/work necessary: power down, pad down • Pad down while stopped • Emergency shut down switches on pad and near wheels • Walk around before re-starting.		LAND M3
2.23.2 Awareness	All employees involved with vibrators to be aware of the risks from HP hydraulic oil. In bad terrain or restricted areas, consideration should be given to vibrator pushers/guides.		LAND M3 S5
2.23.3 Maintenance	Maintenance schedules should be defined. Manufacturers' recommendations should be followed.		LAND S5 Manufacturer manuals
2.23.4 Force	Distances and force values should be pre-defined by mutual agreement between client and contractor to avoid damage to structures, utilities, sub-surface economic features.		LAND E6 E9 E10
2.23.5 Hydraulic fluid leaks	Procedures should be in place to minimise impact in case of hydraulic spills		LAND S5 E6
2.24 Land recording operations			
2.24.1 Safety equipment	All recommended PPE to be worn according to agreed PPE matrix and work conditions. High visibility reflective clothing to be worn by all personnel outdoors in land operations. Any unit with generator power (recorder, battery charging units, mechanic shop, etc.) to be fitted with fire extinguishers, smoke detectors, carbon monoxide detectors (where appropriate). Ensure there is adequate grounding between generator and adjacent vehicles.		LAND M2 S5
2.24.2 Communications, camp to field	Communication systems should be established to allow direct communication between base camp and field units at all times. Adequate repeaters should be installed as necessary.		LAND M2 S5
2.24.3 Recording equipment pick up/lay out by hand or vehicle	Compliance with guidelines, requirements and practices in the reference document.		LAND S5
2.24.4 Line checking	In areas of high risk, (swamp, very rough terrain), line checkers to work in pairs as a minimum, using the buddy system.		LAND
2.24.5 Environment	There should be contractual agreement that provides for an acceptable process to ensure that no trash has been left on line location.		LAND E6 S5

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.24.6 Additional requirements for different types of operations	Compliance with guidelines, requirements and practices in the reference documents for the following types of operations: • Night operations • Helicopter operations • Road operations • Operations during electrical storms • Development of working alone guidelines • Urban area guidelines.		LAND S5
2.24.7 Land operations in darkness	Mutual agreement should be achieved prior to allowing night time operations. Procedures for operations in hours of darkness on land should include: • An on-going risk assessment to determine what operations can be safely conducted in the prevailing conditions (terrain, environment, transport, energy source, emergency response capability, etc.) • All personnel working should wear reflective clothing • Additional lighting (vehicles, facilities, personal) should be considered • Liaison with local authorities and other interested parties as appropriate, e.g. relative to noise and traffic in urban or populated areas • More frequent journey management checks are done. Unforeseen requirement for working at night time should be subject to a management of change process.		LAND S5
2.24.8 Ice operations	Compliance with guidelines, requirements and practices in the reference document. Use of ground penetrating radar (GPR) and competent operator should be considered. Ice thickness and ice freeboard measurements should be taken when working on frozen water bodies.		LAND S5 H2 E4 S52
2.25 High pressure air sources			
2.25.1 Integrity of HP air systems including compressors	The integrity of air compressor and HP air systems including HP piping and hoses, should be documented & demonstrated by: • Certification of the system by an identified 'competent person' as complying with the requirements of an appropriate pressure standard or code • The split of responsibilities between Chief Engineer and Chief Gun Mechanic should be clearly determined • Panels with relief valves should be located away from passage ways or in an isolated area • Hydrostatic testing before being brought into use. Thereafter periodically (5 years maximum) and also after modification or repair is recommended • Preventive maintenance plan • Position/design and operation of relief valves/burst disks • Operation of shut downs/emergency stops • Protection of flexible hoses (minimise in design) • Testing of relief valves and safety devices • Condition of manifold valves for bypass – leave drain valves open • Competence of fitters/repairers. For valves or appliance operating above 100 bar (1,450 psi), remote operation is preferred.		MARINE M3 S5 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.25.2 Integrity/design of array systems and air guns	The integrity of the air gun array systems and air guns should be demonstrated by: • Design of array to minimize manual handling/ergonomics; • Design of array to minimize shock/damage to air guns during deployment/recovery • Preventive maintenance plan • Regular bleed off tests • Safe procedures for isolating and locating air leaks • No local modifications • Inspection routines.		MARINE S6
2.25.3 Air gun operations procedures	Air gun operational procedures should be in place, which should include: • Safe system of work for maintenance – procedures • Awareness training in the risks of HP air • Protection of air manifold/gauge • Warning signs /signals when air guns on deck • Ergonomics – manual handling of air guns/heavy parts is minimized • Safe system of work if test firing • Minimization of pressured air guns on deck – bled down before recovery to deck • Medical emergency procedures in place in case of HP air injury including first aid training • LOTO during maintenance • Awareness of explosion risk of oil in HP air lines, e.g. non-greasing philosophy • Emergency shut-down of compressors away from the panels, e.g. gun deck office, and astern.		MARINE M3 S6
2.26 High voltage electricity (including EM & ROV)			
2.26.1 High voltage electricity – Electromagnetic (EM), ROV operations	Certification of the system to a recognized standard should be in place and procedures that include, but are not limited to: • Awareness training to understand the risks of high voltage electricity • Safe system of work for maintenance procedures • LOTO of electrical systems during maintenance or adjustment • Repairs/maintenance of high voltage equipment only conducted by certified/competent persons • Protection from high voltage electrical systems • Warning signs & barriers when operational • Safe system of work if testing on deck • Medical emergency procedures in place in case of high voltage injury including first aid training • Ergonomics – manual handling of EM fish/source is minimized.		MARINE S6
2.27 Other energy sources			
2.27.1 New technology and developments	As existing technology is developed and new technology identified, other energy sources should be subject to best practice requiring the safe operation of those sources, the protection of personnel operating them, third parties and local fauna. An MoC procedure may be necessary.		GENERAL

	Minimum expectation required to control the hazard(s)/risk(s)	Alternative or exception	Reference
2.28 Cranes/lifting devices			
2.28.1 Integrity of cranes, davits, winches, and other lifting systems	The lifting equipment and gear should be in accordance with the reference and include, but not be limited to: • Lifting register of equipment • Valid certification/approved type for use to local regulatory requirements • Preventive maintenance system in place • Structural condition of foundations/lifting points • Safe Working Loads (SWL) ratings for dynamic loads lifted from seaways (marine systems) • Regular inspection/reports on condition of stops and limit switches • Pull tests for winches carried out at regular intervals • All personnel should wear high visibility and reflective clothing.		GENERAL S20
2.28.2 Integrity of lifting wires, slings, pallets, hooks, barrel clamps	The lifting gear should be in accordance with the reference and assured by: • A preventive maintenance plan • A lifting register to identify wires/slings • All hooks having safety latches.		GENERAL
2.28.3 Control systems	All cranes and lifting devices should have: • Clear controls (centre sprung) • Remote control systems – interlocks/accidental operation security of operating unit and spare systems • Safe positioning of controls with respect to load • Cranes should have limit stop switches and alarms. Any safety devices installed on lifting equipment should be confirmed as operational prior to use.		GENERAL S20
2.28.4 Operations - procedure	The operation of all cranes and lifting equipment should be carried out with: • PTW and LOTO procedures in place during maintenance • Inspection routines in place • Trained and competent operators • Assigned operators/banksmen • Standardized signals • Established clear lines of communication • Use of appropriate PPE • SWL and angles clearly marked • Use of tag lines • Dropped object protection for personnel and equipment. Prior to any lift, the following should be in place: • An assessment of the lift has been completed and the lift method and equipment has been determined by a competent person(s) • A lifting plan in place for crane operations • Anyone involved in the operation, including rigging, is competent for the specific job and/or equipment on which they are working • Load does not exceed dynamic and/or static capacities of the lifting equipment • A competent person(s) has visually examined all lifting devices and equipment before each lift • A safety zone has been established to limit access to all workers except essential personnel • External conditions which could affect the lift are monitored (e.g. ground condition, wind, etc.).		GENERAL M3 S20 S50

Glossary

Below are terms defined for use in this document. The reader should also be aware of additional terms already defined in the Glossary sections in Reports 510 and 423 for completeness.

Term	Definition
Assurance mechanism	An activity, process or action that provides confidence and confirmation that an HSE-MS (or any part of an HSE-MS) is achieving its purpose and expected performance.
Bridging	For activities involving multiple parties using different management systems, bridging is a term for the process of identifying alignment and relevant gaps (including roles, responsibilities and actions) in the different management systems of participants. Bridging documents are needed when all or part of the scope of work is to be performed by using the contractor's OMS, on the basis that it meets the requirements of the client's OMS. Bridging between client and contractor management systems is normally only required for Mode 2 and 3 contracting, although some form of interface document may be required for Mode 1 contracting.
Capability assessment	An evaluation or audit of the collective expertise and capacity of the workforce to perform activities within an asset, business or company, to defined expectation levels.
Drinking water	Water used for domestic purposes, drinking, cooking and personal hygiene.
HSE critical activity	Any activity where the loss of control could result in a major incident.
HSE critical equipment	Equipment, safety or environmental systems, devices, controls or components which are designed to prevent, detect, control or mitigate a major incident or facilitate escape and survival of people.
HSE critical position	Any role that operates HSE critical equipment, or management/ supervisory positions where decisions are made that can result in a major incident.
Industrial water	Used for cooling or cleaning of equipment, firefighting reserve, etc. As long as this does not involve contact with human skin, relatively low quality requirements need to be met.

Interface	A documented identification of relevant gaps (including roles, responsibilities and actions) in the different HSE-MS of the participating parties in a contract which, when added to the HSE plan, will combine to provide an operating system to manage all HSE aspects encountered in the contract with maximum efficiency and effectiveness.
Lone worker	A person is alone at work when they are on their own; when they cannot be seen or heard by another person; and when they cannot expect a visit from another person.
Monitoring	Determining the status of a system, a process, a product, a service or an activity. An activity undertaken by the client which is risk-based and systematic to check on a 'sample and test' basis that contractors are undertaking verification activity as per the agreed plan. Monitoring activity should be performed by competent individuals in accordance with a monitoring plan.
Potable water	Drinking water that meets quality standards prescribed by the appropriate authority.
Semi-industrial water	Used for toilet flushing, laundry, dish washing and similar applications. Semi-industrial water should be safe for contact with human skin but it does not have to meet the stringent requirements for ingestion.
Simultaneous operations (SIMOPS)	SIMOPS are independent activities which may overlap (spatially or temporally) and impact the safety of personnel, the environment, or cause delay to one activity or another.
Small boat	A vessel with less than 24 metres in load line length and less than 150 gross tonnes.
Toolbox meeting	A meeting held by the workforce at the workplace to discuss the HSE hazards that may be encountered during the work and the procedures that are in place to successfully manage these hazards. Usually held at the start of the day's work. A process of continual awareness and improvement.
Verification	An activity undertaken by the contractor which is risk-based and systematic to check that work is being delivered in accordance with the agreed verification plan and that risk controls and barriers are being effectively implemented. The verification plan is owned by the contractor.

Acronyms

The following acronyms are used in this document:

Acronym	Description
ABS	Anti-lock Braking System
ACLS	Advanced Cardiac Life Support
ADR	Australian Design Rule
AIS	Automatic Identification Systems
ALARP	As Low As Reasonably Practicable
ATV	All-Terrain Vehicle
AUV	Autonomous Underwater Vehicle
BC	British Columbia
BOSIET	Basic Offshore Safety Induction and Emergency Training
CAA	Civil Aviation Authority
CAGC	Canadian Association of Geophysical Contractors
CAP	Civil Aviation Publication
CHA	Confirmed Hazardous Areas
CMS	Competency Management System
CO	Carbon Monoxide
COLREG	Convention on the International REGulations for Preventing COLlisions at Sea
COSHH	Control of Substances Hazardous to Health
CSO	Company Security Officer
DHA	Defined Hazardous Areas
DMAC	Diving Medical Advisory Committee
DP	Dynamically Positioned
DROPS	DRopped Objects Prevention Scheme
EBS	Electronic Braking System
EC	European Community
EIA	Environmental Impact Assessment
EM	Electro Magnetic

Acronym	Description
EBS	Emergency Breathing Systems
ERP	Emergency Response Plan
ERW	Explosive Remnants of War
ESIA	Environmental and Social Impact Assessment
EU	European Union
FAQ	Frequently Asked Questions
FMVSS	Federal Motor Vehicle Safety Standards (US)
FRC	Fast Rescue Craft
HACCP	Hazard Analysis Critical Control Point
GMDSS	Global Maritime Distress and Safety System
GPR	Ground Penetrating Radar
GPS	Global Positioning System
GRP	Glass Reinforced Plastics
H2S	Hydrogen Sulphide
HACCP	Hazard Analysis and Critical Control Points
HAV	Hand-Arm Vibration
HAVS	Hand-Arm Vibration Syndrome
HAZID	HAZard IDentification
HCA	Helicopter Certification Agency
HGV	Heavy Goods Vehicle
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome
HLO	Helicopter Landing Officer
HP	High Pressure
HR	Human Resources
HRA	Health Risk Assessment
HSE	Health, Safety and Environment (but in this document also includes Security & Social Responsibility)
IAGC	International Association of Geophysical Contractors

Acronym	Description
IAGSA	International Airborne Geophysical Safety Association
IECO	International Energy Consultants Organization
IFR	Instrument Flight Rules
IIHS	Insurance Institute for Highway Safety
ILO	International Labour Organization
IMCA	International Marine Contractors Association
IMDG	International Maritime Dangerous Goods code
IME	Institute of Makers of Explosives
IMO	International Maritime Organization
IOGP	International Association of Oil and Gas Producers
IPIECA	IPIECA (formerly International Petroleum Industry Environment & Conservation Association)
ISM	International Safety Management (Code)
ISO	International Organization for Standardization
ISPS	International Ship and Port Facility Security (Code)
ITT	Invitation To Tender
IVMS	In Vehicle Monitoring System
JIP	Joint industry Programme (or Project)
JSA	Job Safety Analysis
JM	Journey Management
JNCC	Joint Nature Conservation Committee
KPI	Key Performance Indicator
LOTO	Lock Out / Tag Out
LSA	Life-Saving Appliances
LZ	Landing Zone
MARPOL	Convention for the Prevention of MARitime POLlution from ships
MEWP	Mobile Elevating Work Platforms
MLC	Maritime Labour Convention

Acronym	Description
MMO	Marine Mammal Observer
MMP	Malaria Management Programme
MOB	Man Over Board
MOC	Management Of Change
MOPO	Matrix of Permitted Operations
MS	Management System
MSN	Merchant Shipping Notice
MT	Magnetotellurics
NDT	Non-Destructive Testing
NGO	Non-Governmental Organization
NORM	Naturally-Occurring Radioactive Materials
OBC	Ocean Bottom Cable
OBN	Ocean Bottom Nodes
OGUK	Oil & Gas United Kingdom
OIM	Offshore Installation Manager
OMS	Operating Management System
OPITO	Offshore Petroleum Industry Training Organization
PAM	Passive Acoustic Monitoring
PCB	Poly-Chlorinated Biphenyls
PFD	Personal Flotation Device
PHTLS	Pre-Hospital Trauma Life Support
PLB	Personal Locator Beacon
POB	Persons On Board
PPE	Personal Protective Equipment
PPV	Peak Particle Velocity
PSI	Pounds per Square Inch
PSO	Policies, Standards, Objectives
PSO	Protected Species Observer

Acronym	Description
PTW	Permit To Work
RACI	Responsible, Accountable, Consult, Inform
RAM	Risk Assessment Matrix
RCCB	Residual Current Circuit Breakers
RCS	Respirable Crystalline Silica
ROPS	Roll Over Protection System
ROV	Remotely Operated Vehicle
RP	Redundant Propulsion
RPE	Respiratory Protection Equipment
RPS	Redundant Propulsion with Separation
SAR	Search And Rescue
SDS	Safety Data Sheets
SHA	Suspected Hazardous Areas
SIA	Social Impact Assessment
SIMOPS	SIMultaneous OPerationS
SMART	Specific, Measurable, Attainable, Realistic, Timely
SOLAS	Safety Of Life At Sea
SRA	Security Risk Assessment
SSE	Short Service Employee
SSF	Static Stability Factor
STCW	Standards of Training, Certification and Watchkeeping (for Seafarers)
SUV	Sport Utility Vehicle
SWL	Safe Working Loads
TB	Tuberculosis
TEMPSC	Totally Enclosed Motor Propelled Survival Craft
TRL	Transport Research Laboratory (UK)
TS	Temperature Salinity

Acronym	Description
TWA	Time-Weighted Average
TZ	Transition Zone
UDHR	Universal Declaration of Human Rights
US DOT	United States Department Of Transportation
UV	Ultra Violet
UXO	Un-eXploded Ordnance
VDR	Vehicle Data Recorder
VFR	Visual Flight Rules
VTS	Vehicle Tracking System
WATS	Wide Azimuth Towed Streamer
WBV	Whole Body Vibration
WHO	World Health Organization

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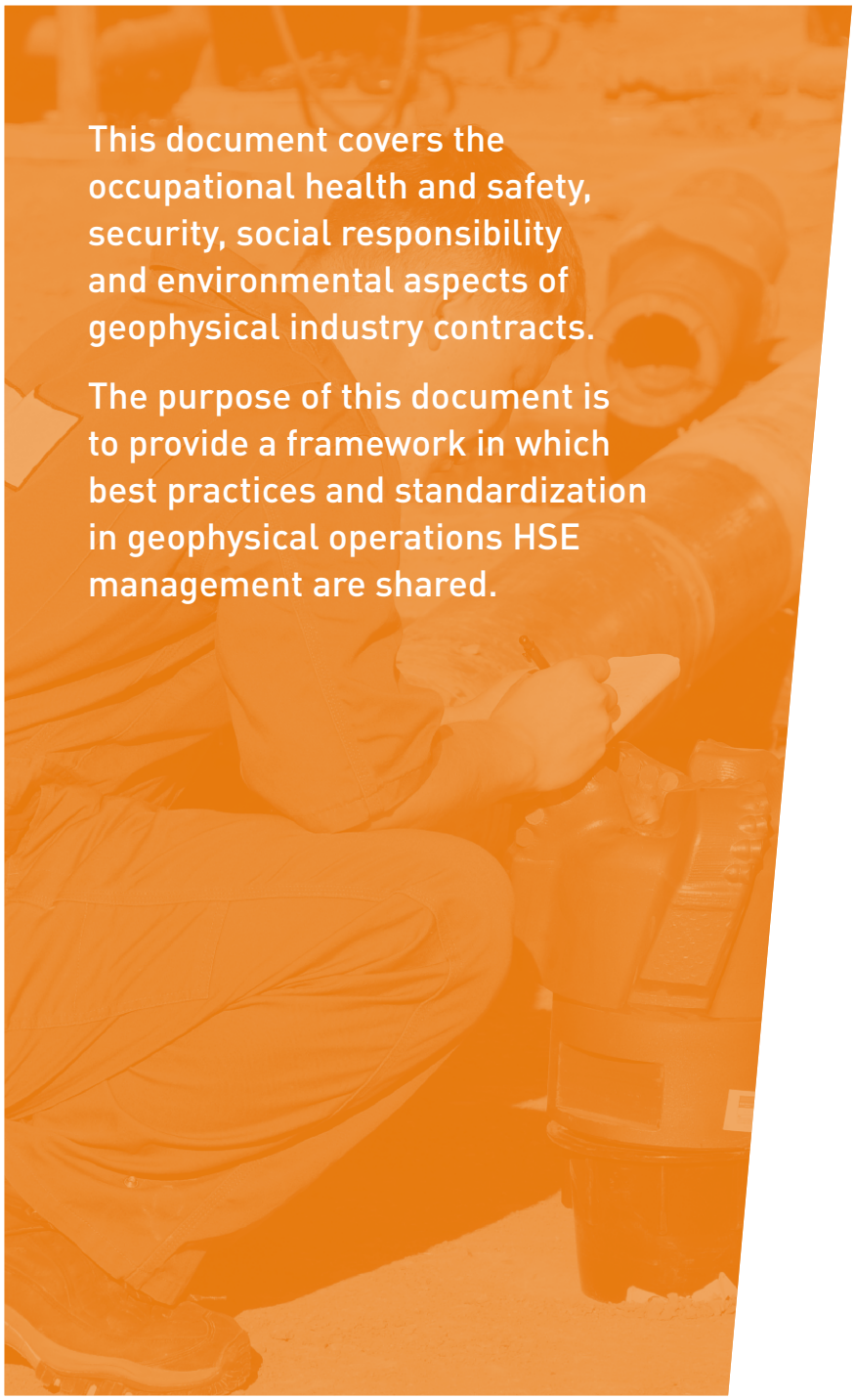

This document covers the occupational health and safety, security, social responsibility and environmental aspects of geophysical industry contracts.

The purpose of this document is to provide a framework in which best practices and standardization in geophysical operations HSE management are shared.