OGP

International Association of Oil & Gas Producers

Managing HSE in a geophysical contract

Report No. 432

December 2009

Publications

Global experience

The International Association of Oil & Gas Producers has access to a wealth of technical knowledge and experience with its members operating around the world in many different terrains. We collate and distil this valuable knowledge for the industry to use as guidelines for good practice by individual members.

Consistent high quality database and guidelines

Our overall aim is to ensure a consistent approach to training, management and best practice throughout the world.

The oil and gas exploration and production industry recognises the need to develop consistent databases and records in certain fields. The OGP's members are encouraged to use the guidelines as a starting point for their operations or to supplement their own policies and regulations which may apply locally.

Internationally recognised source of industry information

Many of our guidelines have been recognised and used by international authorities and safety and environmental bodies. Requests come from governments and non-government organisations around the world as well as from non-member companies.

Managing HSE in a Geophysical Contract

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Acknowledgements

This report, an update of *HSE aspects in a contracting environment for geophysical operations (schedules and plans)*, OGP ref № 317, was put together by a group of OGP and IAGC members over 2008/2009.

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Glossary

3D
Three Dimensional. A seismic data acquisition technique using multiple reflected ray paths across a surface area rather than in line.

ALARP
As Low As Reasonably Practicable. Refers to the target for reducing the level of risk.

Audit
- A systematic, independent evaluation to determine whether or not the health, safety & environmental management system and its operation comply with planned arrangements, and whether or not the system is implemented effectively and is suitable to fulfil the company's health, safety & environmental policy and objectives.
- The examination of the whole system to assess how it has been used over a period, and so make sure it has operated as intended.

AUV
Autonomous Underwater Vehicle.

Berm
A containment facility to prevent unwanted contamination of the surface by leaks or overflows of potentially harmful fluids.

Bridging
A series of 'bridges' usually constructed from line cutting materials, placed along the seismic line in flooded or swampy terrain to provide better walking conditions for line workers.

Sometimes used in the context of an interface document. Bridging is better not used in this context.

Buddy system
A system of work aimed at ensuring personnel look after each other and avoid an individual working alone.

Burn down policy
The Policy adopted by some organisations where, instead of combating the fire, the fire is allowed to burn out after assuring that human life is not in danger.

CO
Carbon monoxide. A poisonous gas produced from incomplete burning of carbon fuels.

Carcinogens
Any chemical, biological or physical agent that can potentially cause cancer.

Client
A company that issues a contract to a contractor or subcontractor. In this document, the client will generally be an oil exploration company that will issue a contract to a contractor to carry out a project. The contractor may then take the role of client by issuing contract(s) to subcontractors.

Common Sense
Applying sound, prudent judgement based on common knowledge and experience.

Company
A legal entity set up to conduct business. The role of a company may be as a client, a joint venture partner; a contractor, subcontractor or a third party.

Competence
The ability to perform a particular job in compliance with performance standards (that is suitably trained and with sufficient experience and understanding to safely perform the assigned work without supervision or with only a minimum degree of supervision).

Compliance
The act of fulfilling the requirements of a standard, specification, or procedure.

Contractor
An individual or company carrying out a project for a client, following verbal or written agreement to a contract.

Crew
The operational unit or work unit (vessel or land unit), consisting of the people together with all necessary equipment and facilities assigned to carry out the project defined in the contract, and usually reporting to a business unit located in close proximity to the project site (lease, concession).

Crisis
An emergency that cannot be managed successfully by the site emergency plan resources and requires immediate external help.

CSEM
Controlled Source ElectroMagnetics. A method of acquiring geophysical data by measuring resistivity contrasts within the Earth.

CSO
Client Security Officer.

EIA
Environmental Impact Assessment. Part of project management concerned with identifying through a formal written technical evaluation, the likely impact (positive or negative) of a proposed development or activity, on the natural and man-made environment. A process whereby the assessment is used in reaching a consensus on acceptable levels of change, defining the means by which agreed standards of operation and procedure will be achieved and maintained.

In this report, EIA includes social, security and health impacts.

N.B. An impact assessment is not the same as a risk assessment. Impacts are caused by the introduced operation and

affect the local environment; risks are resident effects that can cause harm to the project work force, assets & 3rd parties.

EM
Electro-Magnetic.

Emergency
A unexpected and unwanted situation which has the potential for harm.

EMP
Environmental Management Plan.

ERC
Emergency Response Centre.

ERP
Emergency Response Plan.

Ergonomics
The science of studying people at work, and designing tasks, jobs, tools, equipment, facilities, and the work environment, so that people can be safe, healthy, effective, efficient, productive and comfortable.

Expert
A person who has special skills or knowledge in a specific field, and who will usually have undergone recognised training to industry accepted standards. Sometimes referred to as a professional.

Fly Camp
A temporary camp established for a small number of people for a limited period of time for land based geophysical operations.

FRC
Fast Rescue Craft

GPS
Global Positioning System using satellites to accurately define the position and elevation of a location on Earth.

H_2S
Hydrogen Sulphide. Some times called Sour Gas. Smells of rotten eggs. Highly toxic if inhaled and highly flammable.

Hazard
- An object, physical effect, or condition with potential to harm people, the environment or property.
- The potential to cause harm, including ill health and injury, damage to the environment; property, plant, products or production loss or increased liability.
- A source of danger which if not adequately controlled or if suitable precautions are not taken could create an unsafe condition.
- The potential for adverse consequences to arise from the occurrence of an identified event affecting the safety of people, the environment or economic resources.

Major hazards will be identified by assessing the risk they pose by use of the risk matrix.

Hazard Management
A process of identifying hazards that could impact the project, and assessing the probability and consequence of effects, and investigating the options to replace the hazard or mitigate the effect.

Hazard Register
A list of hazards identified as posing significant risk to the company operations.

HLO
Helicopter Landing Officer.

HiPo
High Potential. An incident that could have easily resulted in Severity 4 or 5 consequences on the OGP RAM (read: shear luck that consequences were less severe). One should also include the most severe consequences included in Severity level 3, such as permanent partial disability, but not the less severe consequences listed under Severity level 3. The assessment should be based on a worst case scenario, but one that does remain realistic.

For potential RAM severity 5 cases, the probability and consequences of a breach of one further control should be considered.

In assessing HiPo's, the main emphasis should be on capturing and sharing learnings.

HIV
Human Immunodeficiency Virus. There is no known cure and it develops into AIDS.

HP
High Pressure. Could relate to any fluid, or gas.

HRA
Health Risk Assessment. That is those health risks that are present in the work location and which may cause health problems to the work force.

HSE
Health, Safety & Environment which in this document includes security and social effects.

HSE-MS
Health Safety and Environment Management System.

HSE professional
An individual who is primarily employed as, and is competent to advise management on the health, safety and environmental aspects of the project, in order to achieve optimum protection for all personnel, the environment and assets in general that may be associated with the project.

HSSE
Health, Safety, Security and Environment. This acronym is not used in this document.

HUET
Helicopter Underwater Escape Training.

IA
Impact Assessment. Used where a general non-specific, impact assess is conducted.

IACS
International Association of Classification Societies.

ICU
Intensive Care Units. For dangerously injured or sick people.

IMCA
International Marine Contractors Association.

IMO
International Maritime Organisation.

Incident
An event or chain of events which has caused or could have caused injury, illness to people and/or damage (loss) to the environment, assets, or third parties. (this definition includes first aid cases and near misses)

Interface Document
Sometimes referred to as a bridging document. Interface is the preferred term. With often more than one companies' HSE-MS applicable to the project, an interface document describes the role of each HSE-MS, and, where there is conflict, it sets out which HSE-MS will take precedence in specific operational circumstances.

ISM
International Safety Management code for ships, issued by IMO.

ISPS
International Ship and Port facility Security.

ITT
Invitation to tender

Job Description
A short document which sets out an employee's authority and responsibilities in the job, who he reports to, and who reports to him; what his duties are and the qualifications necessary to perform those duties.

JSA
Job Safety Assessment.

Joint venture
A partnership between two or more clients to conduct a project.

Journey Management
The planned movement of people and equipment from one place to another, including communications, route, scheduled stops, hazard warnings, provisioning, break-down and other contingencies.

KPI
Key Performance Indicators. Measurements that show how effective or not the HSE-MS is.

Lateral learning
A process of learning from the experience of others. A method of continual improvement in HSE management by sharing experiences and bench marking.

Life-jacket
A flotation device designed to keep a person who is correctly wearing the device, in a position in the water so that his mouth is above the surface, even when the person is unconscious.

Lifeboat
A purpose designed boat providing shelter and support for personnel that have had to abandon ship.

Line management
The hierarchy of managers from the top down, with defined authority and responsibility.

LOTO
Lock Out Tag Out. A documented system of barriers, notices and actions that prevents the accidental or inadvertent operation of equipment whilst it is being maintained or inspected.

Major hazard
An identified hazard that has the potential to have a consequence at severity level 4 or 5 on the risk matrix scale.

MARPOL
MARine POLlution. The International Convention for the prevention of pollution from ships (as amended).

Medevac
The evacuation for medical reasons from the work location to a hospital.

MMO
Marine Mammals Observer. A trained person used as a look out for marine mammals during a marine geophysical operation.

MMP
Malaria Management Programme.

MMT
Magnetotellurics. A passive surface geophysical method used to determine the electrical resistivity of subsurface formations from measured very low frequency natural electric and magnetic field.

MOB
Man Over Board.

MoC
Management of Change.

MOPO
Manual Of Permitted Operations. Used to identify high risk operations that require strict procedures of control.

MSDS
Material Safety Data Sheet. A sheet issued by a manufacturer of chemical substances that sets out the hazards likely to be encountered by those who come into contact with the substance. The sheet may also identify recovery procedures following adverse exposure.

Near Miss
Any event which had the potential to cause injury and/or damage and/or loss, but which was avoided by circumstances.

OBC
Ocean Bottom Cable.

Orientation
A process of making people aware of the hazards and HSE procedures relevant to the work site where they will be staying, and especially related to the work they will be carrying out.

PTW
Permit To Work. A formal written system used to control certain types of work, which are identified as a major risk. It provides a means of communication and control between site/installation management, plant supervisors and operators and those who carry out the work.

Essential features of a PTW:

- Clear identification of who may authorise particular major risk jobs (and any limits to their authority) and who is responsible for specifying the necessary precautions.
- Training and instruction in the issue and use of PTW.
- Monitoring and auditing to ensure that the system works as intended.

PFD
Personal Floatation Device. A device designed to keep a person afloat in the water. Some designs may trigger on contact with the water and keep a person's mouth above water whether conscious or not. The may also have whistles and lights for attracting attention.

PPE
Personal Protective Equipment. Includes equipment and clothing which is intended to be worn or held by a person at work and which affords protection against one or more hazards to health and safety. This includes clothing designed to protect against adverse weather conditions.

Policy
- The expression of the general intentions, approach and objectives of an organisation and the criteria and principles on which actions and responses are based.
- A public statement of the intentions and principles of action of the company regarding its health, safety and environmental effects, giving rise to its strategic objectives and targets.

Proactive Indicators
In respect of HSE operations, those measurements of preventative actions such as hazard identification, awareness, training, auditing, *etc*.

RACI
Responsible, Accountable, Consult, Inform. A management tool that identifies , usually by a matrix, who in a management team has the individual task to carry out each of the four elements of the RACI system.

RCCB
Residual Current Circuit Breaker. An electrical safety device that senses leakage currents to Earth within an electrical circuit and automatically switches the power off with a very fast response time.

Reactive Indicators
In respect of HSE operations, those measurements of failure such as number of fatalities, number of lost time injuries, etc.

Residual Risk
The level of risk (as assessed on the risk matrix) after the selected controls have been applied.

Risk
- The product of the chance that a specific undesired event will occur and the severity of the consequences of the event.
- The measure of the likelihood of occurrence of an undesirable event and of the potentially adverse consequences, which this event may have upon people, the environment or economic resources.

Risk assessment
A careful assessment by competent people of the hazards associated with an operation. The potential effect of each hazard, how severe it might be and the likelihood of it occurring should be considered to determine the effort required to make the work site as safe as reasonably practicable.

N.B. A risk assessment is not the same as an impact assessment.

RO
Recognised Organisation. An organisation recognised by flag state to conduct statutory surveys and issue certification on behalf of the flag state.

ROV
Remote Operated Vehicle.

Safety case
A formal written description of the health & safety management system and the controls for major hazards that apply to a UK offshore installation. It is a UK government regulation.

SAR
Search And Rescue.

Senior managers
Those managers or directors who have executive authority to determine & enact strategic policies within their organisation.

SIA
Social Impact Assessment.

SIMOPS
SIMultaneous OPerationS.

SOLAS
International Convention for Safety Of Life At Sea, maintained by IMO.

Stakeholders
Independent parties who have a vested interest in or may be affected by the operation. May includes the general public.

Subcontractor
An individual or company performing some of the work within a project, and under contract to either the client or contractor.

Substance Abuse
Any substance which chemically modifies the body's function resulting in psychological or behavioural change.

Survival Suit
A garment, usually one piece that provides protection to the wearer from harmful exposure, *ie* immersion in water, exposure to toxic environment, exposure to cold.

SWL
Safe Working Load. With regard to lifting equipment.

Tele-medical
The use of electronic facilities to transmit images and/or information regarding a medical case to a remote site or even another country, where expert medical support can be provided.

TEMPSC
Totally Enclosed Motor Propelled Survival Craft.

Third parties
Individuals, groups of people or companies, other than the principal contracted parties, that may be affected by or involved with the project.

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.

Training
The process of imparting specific skills and understanding to undertake defined tasks.

Transition Zone (TZ)
That region which is neither true land nor sea. The littoral zone. It may be a coastal surf zone, swamp, lagoon or beach area.

Trauma
An injury, wound or shock, including stress suffered by an individual.

UXO
UneXploded Ordnance. Ammunition, mines and other military explosive devices, *etc* abandoned in areas of conflict and often hidden in the near surface.

VDR
Vehicle Data Recorder.

VDU
Visual Display Unit.

VTS
Vehicle (Vessel) Tracking System. An electronic system mounted in the vehicle or vessel that records and transmits relevant data on the unit's operation and geographical location to a central monitoring unit.

Waste
Any material (solid, liquid or gas) which is introduced into the project location as a product of the project but which fulfils no further useful purpose, at that location.

WAZ
Wide AZimuth seismic acquisition.

WHO
World Health Organisation.

WMP
Waste Management Plan.

Work instructions
Written instructions for basic, generic disciplines and job related activities, not necessarily unique to a specific process, and which would not warrant a written procedure or similar. Work instructions would provide the basis for toolbox meeting discussions.

1 Introduction

1.1 General

This guideline is a review and update of the previous guideline, *HSE aspects in a contracting environment for geophysical operations (schedules and plans)*, OGP ref № 317, issued in 2001.

This guideline is consistent with and supplementary to:

- *Guidelines for the development and application of health, safety and environmental management systems* (OGP report № 210) (referred to within this report as M1)
- *HSE management – guidelines for working together in a contract environment* (OGP report № 291) (referred to within this report as M2)

Geophysical operations include land, marine and transition zone seismic acquisition and processing, Controlled Source Electromagnetic acquisition (CSEM), passive Electro-Magnetic (EM), Magnetotellurics (MMT), gravity and magnetic surveys, Vertical Seismic Profiling (VSP) and site surveys.

This guideline addresses the HSE management systems currently recognised as good practice and commonly applied in geophysical operations. The guideline describes the structure for a crew HSE plan, a project HSE plan and interface documentation between the involved parties. If the project requires the formation of a new crew, then the crew HSE plan and the project HSE plan may be a single document. For any project, the foregoing combined documentation fulfils the function of a safety case.

While security is an element of HSE management, it is not formally addressed in this document.

Client, contractor and subcontractor each have a duty of care, one to the other, to all personnel and to society at large to ensure that all work is conducted in a safe, healthy and environmentally sound manner whilst maintaining an efficient operation.

1.2 Purpose and scope

The purpose of this document is to record best practices and standardisation in HSE management as applied by OGP members.

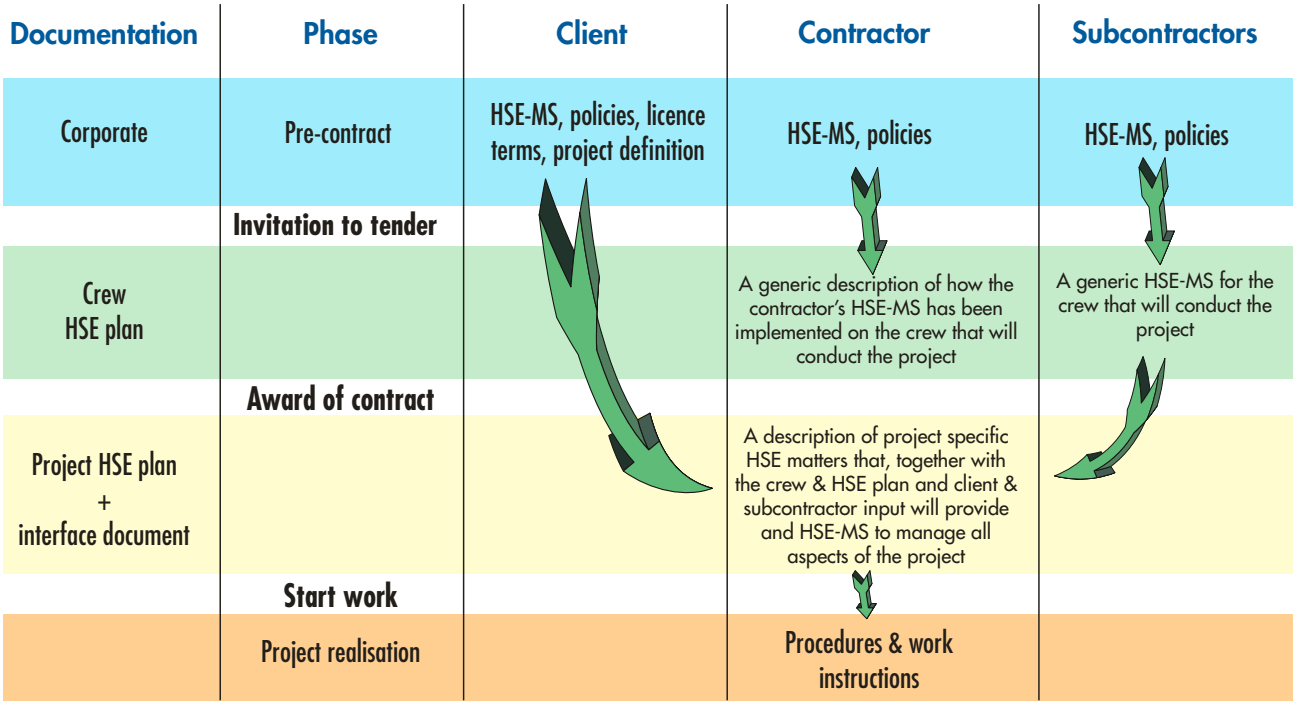
This guideline has been prepared as a reference of industry best practice in Health, Safety and Environmental (HSE) management for all parties engaged in a contract for geophysical operations. It is not limited to client/contractor/subcontractor projects, but can be utilised in any contractual situation where any number of parties are engaged in a project.

This guideline is generic and intended for a global audience. It can provide a good training reference to companies in the geophysical industry that are unfamiliar with the concepts of HSE management through hazard identification and risk minimisation. In the same manner a framework is provided for consistent assessment and fair comparison of potential contractual relationships.

The scope is to set out the elements of the HSE-MS for all participating parties. The presence and maturity of corporate HSE-MS compliant with *Guidelines for the development and application of health, safety and environmental management systems* (OGP report № 210) should be verified before any contract negotiations are undertaken (See OGP report № 291).

Client, contractor and subcontractor each have a duty of care, one to the other, to all personnel and to society at large to ensure that all work is conducted in a safe, healthy and environmentally sound manner whilst maintaining an efficient operation.

The diagram below represents the relationships between the HSE-MS of each participating party, and indicates the development of the overall project HSE management system.



2 Project development

2.1 Client preparation for the project

The client will have prepared a plan to undertake the project. This will include all aspects of HSE management, licence requirements, local government requirements, its own corporate HSE policies and procedures, any joint venture input and the political, economic and security viability of undertaking the project.

It is important that the client has assessed major HSE hazards that may impact the project.

There has to be sufficient lead time to ensure that all parties involved (client, contractor & 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:

- 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.
- data gathering/prospect scouting
- hazard identification
- relevant historical events associated with the prospect that may impact the project
- historical health events/endemic health problems
- commission assessments, including environment, social, and health impacts.
- security risk assessment
- identify stakeholder interests and concerns
- identify potential contractors and subcontractors who will be invited to tender.

2.2 Invitation to tender (ITT)

The client will issue an ITT to its selected contractors (see 3.1) for them to submit a tender. The ITT must identify the major HSE hazards that the client became aware of during the planning stage. This will enable the contractors to submit a tender that will provide a crew that can fulfil the client requirements efficiently and operate with an expectation of zero HSE incidents.

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 facility 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.

2.3 Contractor and subcontractor preparation for the project

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.

2.4 Award of contract

Award of contract represents the acceptance of HSE management processes that all parties have agreed will apply. Negotiations and adjustments should have been thoroughly discussed and agreed at this stage.

3 Selection of contractor and subcontractor

3.1 General

OGP report № 291 is the controlling OGP document on recommended industry methodology 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.

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 OGP 291) and inspection under operational conditions if operational risk is at a level yellow or red on the RAM in this guideline (mutual agreement is required to allow such inspection).
- Mode 3: no capability assessment, but product specification, inspection and quality control of the products required.

Note that some Mode 3 contracts will have to be considered as HSE critical, *eg* medical service providers, hospitals, off site food/catering providers, hotels, airlines and (aviation) fuel providers. These will 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 considered as not 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 acquires geophysical data and retains data ownership, but sells used 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, ranging from undisputed Mode 3 in case of 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) and/or if client would be the only subscriber to a non-proprietary survey being planned.

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. Always the objective is to ensure that the contractor who is chosen to carry out the project 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 that such subcontractors are engaged and how these subcontractors are managed during operations. The interface process should clarify these terms.

3.2 Contractor selection

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

3.3 Subcontractor selection

The chosen contractor will select its subcontractors that will provide active involvement (labour contractor, shot hole drilling, aircraft rental, bulldozing, on site catering, *etc*) for the project, by issuing an ITT and with a shortened version of Tables 1 and 2 relevant to the service that the subcontractor will provide (*see* modes of contracting in Section 3.1 above).

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 and the level of associated risk.

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

Subcontractor selection may be subject to client approval.

4 Crew HSE plan

4.1 Introduction

The contractor and subcontractors should have developed an HSE-MS for their various working units (crews). This will be a system that follows the requirements of their corporate HSE-MS and corporate HSE policies as they apply to their crew, and be compliant with OGP report № 210 & 291.

The crew HSE plan will be specific to the crew, which may be a seismic unit working on land or transition zone, a seismic vessel, another type of operation gathering geophysical data, a dedicated local processing centre or a subcontractor unit.

The purpose of the crew HSE plan is:

- to provide assurance of the effective working of the corporate HSE-MS at a crew specific level.
- to provide a simple, methodical and auditable reference document containing all information relevant to the protection of people, the environment, the assets/infrastructure and the reputations of all parties, including that of third parties.
- to serve as a system for the identification of major hazards and the assessment of risks to the project.

The crew HSE plan can be used to demonstrate that:

- the contractor or subcontractor has an effective HSE-MS which is being applied to the project.
- major hazards and effects of – and to – the project (people, the environment, assets and reputation) have been identified, assessed, and controlled and that recovery preparedness measures are in place (*see* Section 4.2).
- the execution and maintenance of all control and recovery measures are the responsibility of specific, named persons (*see* Appendix 2).
- that risks have been evaluated and measures taken to reduce risk to a level that is 'As Low as Reasonably Practicable' (ALARP).

It also documents the programme of formal major hazards and effects assessments conducted by the contractor and regular subcontractors across their operations.

The crew HSE plan should demonstrate that the contractor and the regular subcontractors are making efforts to continuously improve the management of HSE.

The crew HSE plan should contain a section addressing all recognised shortfalls found in the corporate HSE-MS or the way it is documented in the crew HSE plan. This section should identify and prioritise all action items, establish accountable parties and target completion dates.

Senior management commitment to the corporate HSE-MS should be the main driving force behind preparation of a crew HSE plan, including by making resources available for its development, and conducting workshops to introduce the crew HSE plan. However, an effective crew HSE plan should be prepared by those directly involved with the specific crew and should be owned by those responsible for it. The crew HSE plan should be fully endorsed by, and issued under the signature of the senior person one level above the site manager.

4.2 Documentation and contents

A large, voluminous document can be difficult to implement and therefore ineffective. Hence, format and style is extremely important. The layout and structure must help the reader find the relevant information. It must 'read well'. Information must be readily accessible, in clear, concise language (*see* Section 6.1) and a threshold should be set as to the level of detail to be included.

A suggested list of contents for a crew HSE plan is as follows:

1. introduction
2. description of the facilities and operations
3. description of the operational HSE-MS
4. hazard management
5. remedial plan.

Section 1: Introduction

This section should include:

- an outline of the crew HSE plan
- crew HSE plan review cycle and responsibilities.

Section 2: 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 3: Description of the operational HSE-MS and its relation to the corporate HSE-MS

The proposed structure of this section follows the headings of the *Guidelines for the development and application of health, safety and environmental management systems*, OGP report № 210.

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 'organisation', a crew organisation chart should be included.

The structure is given below with a summary of main topics. A detailed list of the HSE-MS expectations is given in Table 1.

1. Leadership and commitment
2. Policy and strategic objectives
3. Organisation, resources and documentation
4. Evaluation and risk management
5. Planning
6. Implementation and monitoring
7. Auditing and reviewing.

Section 4: Hazard 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). The management of these hazards is the foundation stone for building a good HSE-MS.

A register of hazards assessed as a major risk to the operations the crew normally engages in, should be included as part of the crew HSE plan.

Hazards that pose a risk to the health and safety of personnel should be identified, and assessed on an ongoing basis. The usual hierarchy of hazard controls are set out below.

- Eliminate the hazard if safe to do so.
- By appropriate design.
- Substitute with a lower risk situation.
- Reduce the hazard, by the use of safe working procedures.
- Engineering techniques to manage the hazard.
- Administrative controls.
- Where residual risk cannot be controlled by corrective measures, then the employer should provide appropriate Personal Protective Equipment (PPE). This must always be the last control system after all others have been put in place.
- Recovery.

Hazard prevention and control procedures should be established, that should:

- be adapted to the hazards and their respective levels of risk that are encountered at each work site.
- be reviewed regularly and modified if necessary.
- comply with country laws and regulations, and reflect industry best practice, and the current state of knowledge and understanding.

Levels of risk should be assessed using the OGP Risk Assessment Matrix (RAM) provided in Appendix 3, or similar.

Each hazard assessed as a major risk should be described and include the following:

- Hazard description
- Possible consequences of hazard release (unmanaged or uncontrolled hazard):
  - What could happen?
  - What are the possible end results?
- Risk assessment based on the potential consequences of the hazard release and the probability of this potential consequence materialising, if no special control measures are put in place. Risk assessment should be conducted in the context of the activity where the risk is encountered. The same hazard may be encountered in different locations and/or different types of operation. The risk must be assessed for each situation, and may require different management strategies.
- Threats that could release the hazard. Examples are poor weather (resulting in bad visibility, slippery roads, *etc*), corrosion (resulting in leakage of fuel containers), *etc*.
- Measures (barriers) to control such threats. Barriers include physical guards, separation, procedures, *etc*.
- Escalation factors that may increase the probability or consequences of hazard release. Examples are worn tyres (aggravating the situation in case of poor weather), impact on fuel store (aggravating the situation in case of corrosion), *etc*.
- Control measures for escalation factors.
- Residual risk assessment based on the potential consequences of the Hazard release and the probability of this potential consequence materialising, after all control measures have been put in place.
- Measures to recover from the release of a hazard.
- Assessment of effectiveness/importance of threat control and recovery measures such an assessment would allow a judgement whether a major risk is adequately controlled. It would also allow control tasks to be ranked in order of priority and importance.
- Cross reference of the controls and recovery measures to procedures, job descriptions and other documentation used to implement the HSE-MS in the operations, including PPE specifications.

Section 5: Remedial plan

This section should include:

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

4.3 Development of a crew HSE plan

The crew HSE plan is the framework for documenting the HSE-MS applicable to the crew. Scope and complexity of the development process will depend on the size and type of the operation, and the level of experience of the crew members and the level of continuity of the crew as an entity.

There should be a strong emphasis on continual improvement.

The target audience of the crew HSE plan will be the crew line management and for them to communicate the plan to all the crew personnel. In practice, the best 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.

Translations into other languages of parts or all the crew HSE plan may be required.

The crew HSE plan should be seen as a reference document, which points to more detailed documents. It is not necessary to include extensive material from other stand-alone documents except where this is essential to make the document easy to understand and comply with.

Document control (*see* Section 6.1) is important: an electronic version may be more easily updated and distributed than a paper version, but it may not be available to the end user in the field. Paper versions would more easily enable dissemination of relevant 'subsets' to crew members.

A formal management of change procedure should be in effect to handle any changes to the crew HSE plan so that changes are communicated in timely fashion to all staff. Ensure that the procedure to update the crew HSE plan is understood and that a custodian is appointed.

Two important means of ensuring that crew members are familiar with their roles in relation to implementation of the crew HSE plan are:

1. Develop an instruction package to introduce the crew HSE plan, its objectives and its practical use. This package should be short and simple, should be given to all staff during their induction course and should be the basis for regular discussion during crew meetings.
2. Define clearly what (sub) sections of the crew HSE plan are to be disseminated to the various levels of the crew, what level of familiarity with these subsets is to be achieved and what use and feedback is expected from each crew member

A general responsibility of all staff is to constantly review hazards in their work area, and to feedback results into the crew HSE plan, either into the procedures, or into the hazard register.

Job safety analysis reviews of hazard sheets and procedures should be part of each individual's job and responsibilities.

Control and recovery tasks as determined in the hazard sheets and assigned to individual staff should be attached to individual job descriptions.

5 Project HSE plan

5.1 Introduction

The project HSE plan should be generated with input from client, contractor and subcontractors. The ownership of the project HSE plan should be assigned to the contractor.

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

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

- Ensures that the crew staff have a similarly structured document from project to project (although the content details may well change significantly) which they can familiarise themselves with in 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 controls (*see* Section 4.2). This is more easily achieved if the contractor has the responsibility for compiling the project HSE plan in addition to their overall responsibility for their crew HSE plan.
- Allows the same format to be used for the hazards in the project HSE plan as those in the crew HSE plan, and it should be possible to use the same system for assigning controls to individuals.
- Combines the findings of the initial scouting (health, safety, security and environment aspects) carried out by the client and any additional more detailed scouting carried out by contractor, which identified the project specific hazards and any available operational support such as medical resources and aircraft or helicopter landing sites (the client should have informed the contractor of any such project specific hazards and the minimum required controls and any support resources during the tender process, and the specific controls proposed by the contractor should be documented in the project HSE plan if not already done so in the crew HSE plan).
- Legal requirements, such as reporting to external parties; specific environmental restrictions, *etc*.
- Joint analysis of differences and gaps between the contractor HSE-MS as implemented (and documented in the crew HSE plan) and the client HSE-MS requirements. (*see* 'interfacing', Section 5.4)

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.

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

5.2 Documentation and contents

The main purpose for the project HSE plan is:

- Provide assurance of the effective working of the interface between the HSE-MS of client, contractor and subcontractors at the project level; to document this interfacing; and to include the necessary interfacing between other parties that may be impacted by the project. For example: local communities, production centres and offshore platforms.
- To demonstrate that all involved parties have the necessary procedures – Permit to Work (PTW), hazard and risk controls, operating instructions, Lock Out Tag Out (LOTO), Manual of Permitted Operations (MOPO), Management of Change (MoC), emergency plans and controls in place to achieve the project programme without compromising HSE performance. These systems should be harmonised where possible to minimise the potential for misunderstanding.
- Document any project specific hazards that are not covered or not adequately covered in the crew HSE plan.
- Document the project emergency and recovery plans, with clear identification of the roles and responsibilities of third parties that may be involved.
- The project HSE plan can be either:
  - A joint plan including interfacing; or
  - A contractor owned plan supplemented by separate interfacing.

The project HSE plan may be issued as an integral part of an overall project plan covering a wider scope (*ie* also including quality and technical issues), but it is recommended

to maintain a clear distinction between the HSE part and other parts of the document, and to maintain a structure for the HSE part as proposed below.

The project HSE plan should focus on issues which are not described in the crew HSE plan, or which are agreed to (temporarily) differ from the crew HSE plan description.

For the same reason, the project HSE plan may refer to higher level client and/or contractor documents such as HSE policies, HSE objectives and performance expectations and EIA requirements, but duplication should be kept to a minimum.

The intent of this proposed format is less on exact content than on location in the document of specific topics in order to standardise lay-out and improve ease of use.

Document any project specific hazards that are not (or not adequately) covered in the crew HSE plan.

Document the project emergency and contingency plans, with clear identification where third parties play a role.

A suggested structure for the project HSE plan is given in Appendix 1 with a summary of main topics.

1. Introduction and purpose
2. Description of the project
3. Management system interfaces
4. Contingency and emergency response plans
5. Project specific hazard register (optional)

It is important that due care is taken to identify any hazards that are not already properly accounted for in the crew HSE plan, and that their levels of risk is properly assessed and managed.

5.3 Development of a project HSE plan

As the project HSE plan is only valid for a single project, and may change significantly from project to project, it is essential that a significant effort is made at the start of any project to make all staff aware of its contents. They should already be familiar with and understand the crew HSE plan. Staff should especially be made aware of all key policies and procedures that will be applicable during the project.

This could be done by:

- Highlighting all key issues during pre-mobilisation meetings with senior crew staff.
- Presenting a summary of the project HSE plan at the pre-start crew briefing meeting.
- Requiring senior staff to sign that they have read and understood all aspects of the project HSE plan.
- Testing critical issues (such as medical evacuation arrangements) before or immediately after start of operations.
- Making the project HSE plan a standard topic on all HSE committee and departmental HSE meetings.
- Making the document available at key locations throughout the operation and making a copy available to all senior staff down to department head level.

Responsibilities under the project HSE plan (notably those related to any hazard sheets in the project HSE plan) will generally change more frequently than those under the crew HSE plan.

A particular effort will therefore have to be made to ensure that all senior staff are aware of these project specific responsibilities. Preferably they should be informed of these responsibilities in writing (for example contained in their job description).

On a regular and fixed basis, both the client and contractor focal points for the project HSE plan should review the document for its continuing validity and verify its correctness.

Any changes should immediately be brought to the attention of all concerned and outdated copies removed from the system, as required by the management of change procedure.

5.4 Interfacing

Whilst typically a stand-alone document, the interface document may also be included as part of a project HSE plan.

In general, interfacing (sometimes referred to as bridging) will be required whenever two or more independent parties need to play an active role in the project. It is also necessary to recognise third parties who may be affected, have influence or a role to play.

This is especially important for activities which are shared between different participating companies, to identify lines of communication and lines of management and responsibility. Activities that vitally need to be covered are emergency situations, the management of change and the investigation and reporting of incidents and recovery procedures.

It is especially important that emergency procedures and recovery plans are carried out efficiently. Therefore third party participants in these activities need to be included in these plans to ensure smooth operation, with no uncontrolled major hazards that may cause unnecessary danger to people, the environment and assets.

The interface document should record the following:

- Identify participating parties
- Client, contractor and subcontractors should ensure and agree that the project will be managed as an integrated operation
- Activities that are shared between two or more parties should be identified.
- Any conflicts between the HSE-MS systems of participating companies should be resolved
- It should be clearly acknowledged that any worker has the responsibility and right to stop any operation where the safety of individuals is compromised
- One party should have overall responsibility and control of the project work; this will typically be the contractor
- Clear identification of who is responsible for specified activities.
- Clear and direct lines of communication and contact points.
- Clear understanding on which procedures will be used.
- Changes of 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 interface document.
- Third parties should be identified as early as possible at the beginning of the project
- Obligations to third parties and third party authorities need to be identified

6 Document control

6.1 Document management

The control of all documentation associated with the project should be properly managed. All documents should be dated or have a version number on every page. A record should be kept of the location of all issued copies, and a system should be maintained whereby document holders confirm receipt of revisions. An equivalent system of controls should be in place for electronic systems.

Dissemination of the project HSE plan will in general be wider than that of the crew HSE plan, and may well include third parties (rig Oil Installation Manager (OIMs), authorities, *etc*). Changes are more likely to occur at the beginning of the project and therefore require update of the project HSE plan more so than the crew HSE plan.

Appendix 1
Project HSE plan, key elements

This appendix provides headings and subject material that should be used as the basis for defining the key elements of the project HSE plan.

Where an interface document supplements the project HSE plan, there may be additional information contained there-in on the topics below. As an example, in 1.4 *Emergency response plans*, the client may take primacy/control of the incident and mobilise its own ERC in the event of a significant incident.

	Items	Checked
1.1 Introduction and Purpose		
Revision status	The document(s) should be clearly identified as to the date and revision status.	
Custodian	The designated contractor custodian of the project HSE plan should be stated together with the identification of the client project leader.	
Signatories	The project HSE plan should be signed by a senior contractor representative who is on site. The project hse plan 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,	
1.2 Description of the Project		
Description	For the benefit of all of those parties impacted by the project including client, contractor, subcontractors and other third party organisations, a description of important project specific issues such as: • Project area. • Legal/regulatory licence requirements. • Resources – crew member experience/crew continuity status. • Restricted areas. • Terrain. • Camp 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.	
Project specific	If required for the benefit of relevant Third Parties, a basic description of the geophysical operation and any special characteristics e.g. vibrator trucks; bulldozers; shot hole drills; dual vessel; platform undershoot; special environmental requirements; difficult terrain etc.	
1.3 Management System Interfaces		
Policies	Identify and reference applicable client, contractor and subcontractor HSE policies see Table 1 (actual policy documents can be appended if appropriate).	
Project objectives and performance	Summarise project HSE performance metrics (KPI)	
Organisation, 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 etc. Include a summary of HSE responsibilities and authorities of key project staff If applicable, describe the organisational Interfaces with e.g. supply vessels; platforms; onshore facilities; local government bodies; police etc.	
Resources	Description of other client HSE and operational support resources if considered relevant. Other contractor and subcontractor staff resources should be included if relevant and not already described in the crew HSE plan.	
Subcontractors	Provide details of project specific subcontractors e.g. caterers, chase vessel etc. not described in the crew HSE plan.	

	Items	Checked
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.) that are not covered in the crew HSE plan.	
Training and competence assessment	Summarises project specific training requirements not described in the crew HSE plan e.g. HSE induction, tests, exercises etc. Summarise project specific competence assurance processes.	
Hazard management		
Risk assessments	Details of the process used to manage project specific risks not addressed in the crew HSE plan (e.g. risk assessment matrix; joint hazop meetings; toolbox meetings etc.) Details of all identified project specific risks and risk reduction measures not addressed in the crew HSE Plan (e.g. special speed limits; small boat usage; boat to boat transfers; platform close approach; nearby drilling operations etc.) with clearly allocated responsibilities for risk reduction activities.	
Environmental impact assessments	Summarise any EIAs carried out which impact the project and list actions arising from such EIAs.	
Planning		
Project specific procedures	A summary of project specific procedures to include, for example, where relevant: • 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 • Agreed other restrictions not included in crew HSE plan	
Safety critical information	A summary of critical safety information provided by the client to contractor and from base to crew e.g. maps and charts; hazard notifications on structures; vessel/rig and well movements; diving activities etc.	
Test exercises	List any agreed emergency exercises to be carried out over and above those described in the crew HSE plan	
Permitted operations	A summary of operational restrictions in a MOPO, for relevant activities. The use of a matrix of MOPO is a useful aide-memoire for all departments showing where MOPO restrictions apply especially where parallel activities exist.	
Project specific procedures to cover change	Describe the management of change procedure for e.g. programme, and procedure changes (authorisation process, hazard/risk re-assessment, etc.). Describe the management of change procedure for staffing level or personnel changes (authorisation process, etc.). Describe the procedure for exemption to standards, including who can approve such exemptions.	

	Items	Checked
Implementation and monitoring		
Performance indicators	A description of the HSE performance indicators for the project (to the extent not covered under policy and objectives above). What are the KPIs for the project.	
Joint review	A process and schedule for a joint review by client and contractor of HSE performance.	
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. Incident seriousness level required to trigger a particular type of investigation, and recovery.	
Inspection programme	Summarise 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	
Audits and reviews		
Project audits	Describes the joint client/contractor audit and review schedule	

1.4 Emergency response plans

Summary	Summarises emergency response procedures. Describes the role of the Client, Contractor and Subcontractor in an Emergency.	
Emergency Response Centre (ERC)	Describes the ERC set up and the circumstances in which the ERC should be initiated. Identify whose ERC will be used in special circumstances.	
Emergency services	Describes the emergency services that are available in the event of an emergency e.g. coastguard; medevac; hospitals; evacuation; fire-fighting. Set out the call out procedures.	
Contact numbers	Contact telephone; fax; email; radio etc. numbers for all relevant project personnel, third parties and emergency services	

1.5 Project specific hazard register (optional)

Hazard identification	Describe any major hazards identified at project level which have not been adequately managed in the crew HSE plan.	

Appendix 2
Allocation of responsibilities

Allocation of responsibilities and authorities should be clearly identified, and the use of responsibility, accountability, consult, inform – (RACI) diagrams is suggested. Job descriptions and work instructions should be provided.

An important element of an HSE-MS is the clear specification of individual responsibilities at crew level for HSE critical activities and tasks. This is an effective method to ensure that such activities and tasks are carried out without incident, and that major hazard controls are implemented and maintained. It is recommended to develop job descriptions containing responsibilities for each supervisory position on the project.

Job descriptions

Job descriptions are intended for the staff personnel, *ie* the line management, and should cover all the key HSE critical activities. They should also identify the major hazards associated with the job.

It is recommended that each staff member is 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)

HSE critical activities

Each of these activities, and any others that are identified as critical, should be assigned to a (senior) accountable person via their Job Description. It is recommended to establish a list of such activities for the Project, and to ensure that each is assigned to an identified individual. Geophysical operations involve a number of managerial activities that, although not "hazardous" in themselves, are critical for the proper and safe conduct of the Project.

Activities:

1. Scouting of new area.
2. Hazard identification and risk assessment.
3. Deciding how the work is 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 (catering, *etc*) and medical services.
9. Executing transport (journey management system, *etc*).
10. Scheduling field operations.
11. Maintenance of equipment (mechanical, electronic, *etc*).
12. Restoring site(s).
13. Determining incremental HSE measures to compensate for crew inexperience or lack of crew continuity.
14. Execution of safety critical crew jobs, *eg* driving, crane operating, small boat driving.

Work instructions

Work instructions should be provided for those daily tasks that are carried out by the labour work force. They should be reviewed regularly, and toolbox meetings should identify any misunderstandings or conflicts, which should be promptly corrected.

Common workplace hazards are usually not formally analysed in the hazard register, but control is established by good workplace 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 procedures to their job description.

Procedures

Practical operational activities assessed as having major hazards associated with them, should be managed by a written safe working procedure, which should be reviewed throughout the term of the Project according to the employer's management system requirements.

Identification of responsibilities

EVERYONE HAS A DUTY OF CARE TO THEMSELVES AND OTHERS

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

- All personnel involved in the project have a duty to observe HSE procedures and to use common sense at all times.
- All personnel involved in the project have a duty to observe HSE procedures, and to stop the job if they feel at risk or uncomfortable until a safe way to continue is agreed with a supervisor.
- Where applicable, it should specify for example what input (such as a checklist) should be used for an activity, and what output should be produced (report or other).
- Where possible, clear targets (frequency of carrying out the task, etc.) should be specified in the work instructions.
- Reference or standards documentation applicable to an activity or task should be referred within a job description.

Competence

Certain activities and tasks will require minimum competencies, such as training completed. Where this is the case these should be documented centrally for each position, but could also be included on the job description for that position, possibly linked to the relevant activity or task.

General responsibilities

In addition to the general HSE responsibilities of senior staff, such staff should also (in their job description) be made responsible for verifying that all activities, tasks and major hazard controls assigned to their subordinates are carried out properly (and according to identified performance criteria), and that their personnel meet the defined competence requirements.

Appendix 3
Risk assessment & matrix

Aide memoir for geophysical risk assessors

The assessment of levels of risk is highly subjective. Risk management has to be experience-based, and hence needs a 'memory function.' Risk assessments for low frequency, high potential incidents (fatalities) need to be done on the basis of collective industry experience.

To help address this situation, the joint IAGC/OGP Geophysical HSE Subcommittee have assembled a simple database of fatalities from geophysical operations that have previously occurred. This database should be consulted when using the risk assessment matrix to check whether events have indeed taken place in geophysical operations and with what sort of frequency. It will further serve the purpose to:

- Provide essential training material for the new generation of professionals.
  - Knowledge of what has gone wrong in the past.
  - Avoid re-inventing of the wheel the hard way.
- Help answer the question: 'has this happened before?'
- Provide completeness checks on hazard registers and HSE guidelines and manuals.
- Provide further statistical insight on the risk pattern and profile for geophysical operations.
- Enable the use of the full industry experience, rather than the limited experience of a single company or individual.

It is recommended that operations geophysicists familiarise themselves with the contents of this database, particularly if they are involved in the process of risk assessment. The database and the related user manual can be found on the IAGC website: **http://www.iagc.org/AideMemoir/**.

IAGC is maintaining this database and actively looking for further fatality reports. The database also provides valuable insight in where the main risks are in geophysical operations, as shown below. The statistics will change as further reports are added to the database, but the trends depicted are not expected to change significantly.

Note that the pivot charts plot the number of fatal incidents for a given type of incident, not the actual number of fatalities; the latter can be found in the database itself.

It should be noted that this database was formed as an industry initiative supported by the IAGC to store knowledge; the details are as provided by the reporter of the incident with minimal interference from IAGC regarding the contents of the reports.

Extract from IAGC's Aide Memoir *(full database has 539 records as of October 2009; Inumber of fields also limited below for clarity)*

Fat.	Decription	Comments	Geophysical/ other	Operation	Type of accident	
					Broad	Fine
1	Layout crew labourer killed. A geophone layout crew was attacked by spear wielding men, one employee targeted and hit with three spear strikes which resulted in him being fatally wounded.	What was learned: risk assessment did not identify tribally related revenge attacks (blood feud) taking place against locally hired employee's while they were working for seismic contractor.	Geophysical	Land	Violence	Assault
3	Two crew entered the anchor chain locker to investigate a noise. Later, when it had become evident the two were in trouble, a third person (with BA) also entered, but also collapsed.	Chain locker was confined space, with no ventilation. Later testing showed low O_2 levels.	Other	Marine	Asphyxiation	Asphyxiation
1	During remediation works in a flooded area, a swamp buggy owned by the contractor turned over in deep water. The driver could not get out of the cabin and drowned.	The tractor operator was fully aware that he was taking a risk driving through open water and that it is forbidden to operate the swamp buggy without auxiliary pontoons, but still decided to do the job that way.	Other	TZ	Vehicle incident	Vehicle in water
3	Three workers of a seismic crew died due to premature explosion of high explosives used for shooting.		Geophysical	Land	Explosion	Explosives
1	A subcontractor trouble-shooter helper attempted to swim a canal. Trouble shooter helper got into difficulties, his colleagues were unable to help and he drowned	What was learned: poor discipline, victim jumped into the canal to swim knowing that there was a no swim directive, possibly to show off in front of his colleagues. No lifelines, lifebuoy or life vests available on special canal crossing team. Inadequate communication of how canal crossings were done for wide canals.	Geophysical	Land	Drowning	River crossing

Figure 1 – Fatality causes, E&P industry
Data from OGP report No. 419

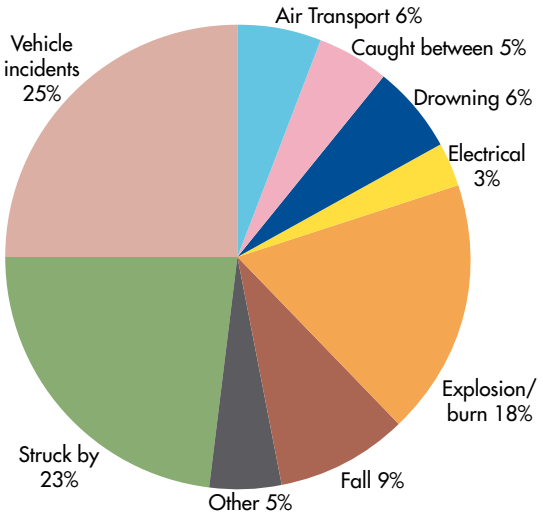
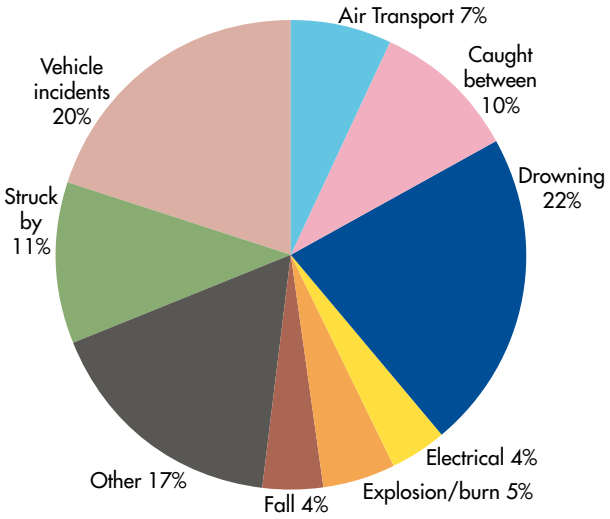


Figure 2 – Fatality causes in geophysical operations
OGP incident classification



Figures 1 & 2 use the OGP incident classification. It is interesting to compare Figure 1 (E&P industry distribution) with Figure 2 (geophysical operations distribution). There are notable differences, showing that the risk profiles of activities can be very different.

To be able to analyze the data in more detail, the IAGC used an incident classification with 20 elements, which is more detailed than the standard OGP one. For accident classes containing many incidents, a further sub classification was developed.

For clarification, the two classifications are compared in the table below:

OGP & IAGC classifications

OGP class	IAGC class
Air transport	Aircraft
Caught between	Caught Between (Crushing)
Drowning	Drowning
Electrical	Electrocution
	Lightning strike
Explosion/Burn	Explosion
	Fire
Fall	Fall from Height
	Fall at same level
Struck By	Struck By
Vehicle incidents	Vehicle incident
	Motorcycle incident
Other	Animal
	Asphyxiation
	Boat collision
	Fire arms (accidental discharge)
	Medical
	Suicide
	Temperature
	Violence

Figure 3 provides the same data in the full detail of the IAGC classification. From this it becomes evident that the top five accident types in geophysical operations are:

1. Drowning.
2. Vehicle incident.
3. Caught between (mainly slow moving vehicles and pedestrians)
4. Struck by (mainly chain saw tree felling)
5. Aircraft (mainly land seismic helicopter support)

Figure 3 – Distribution of fatal incidents in geophysical operations *by type*

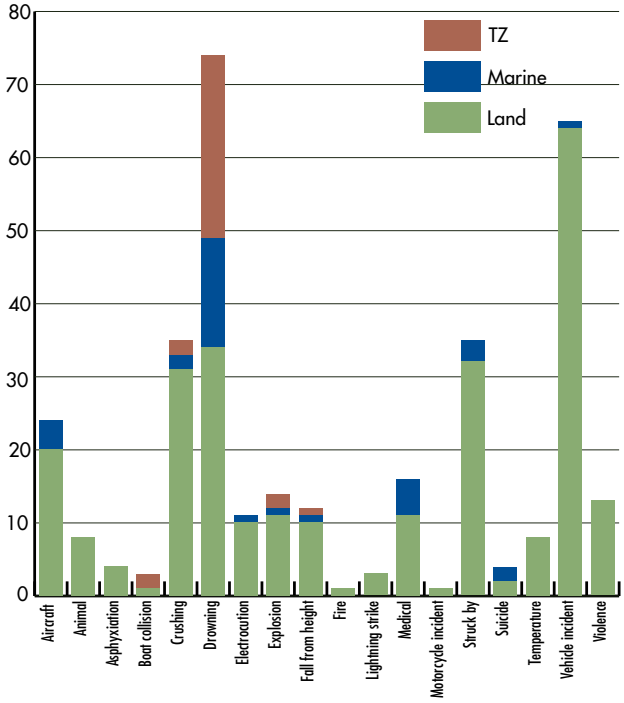


Figure 4 – Analysis of drowning incidents in geophysical operations

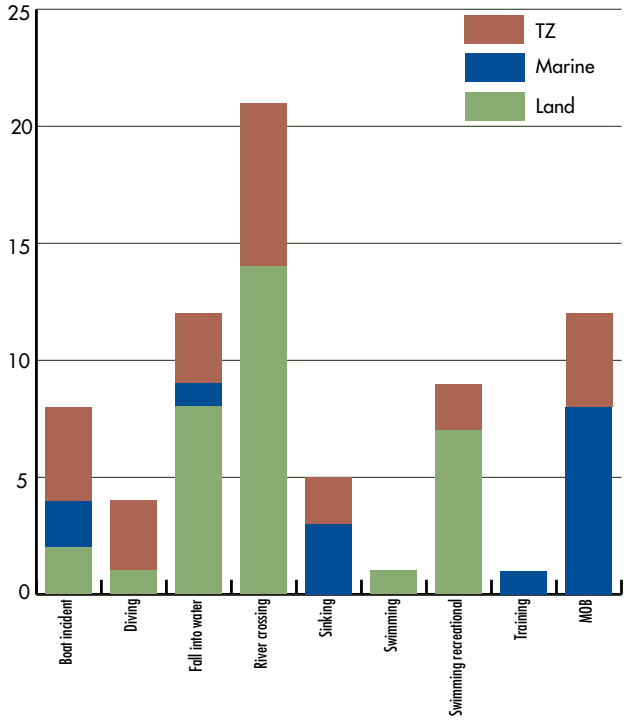


Figure 5 – Analysis of 'caught between' (crushing) incidents in geophysical operations

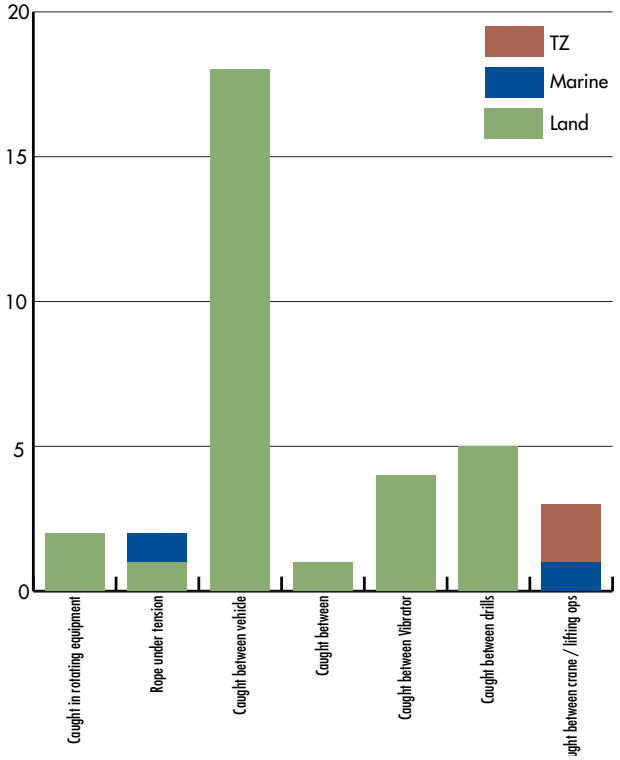


Figure 6 – Analysis of 'struck by' incidents in geophysical operations

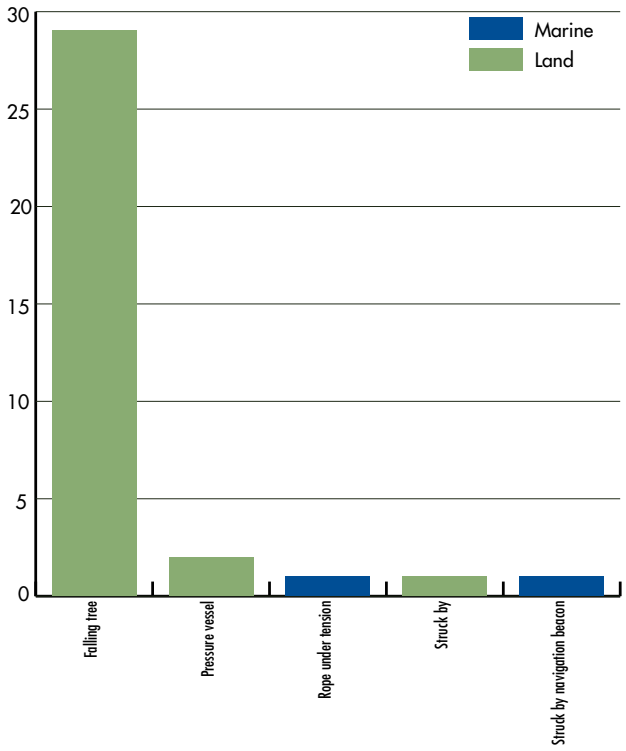


Figure 7 – Analysis of vehicle incidents in geophysical operations

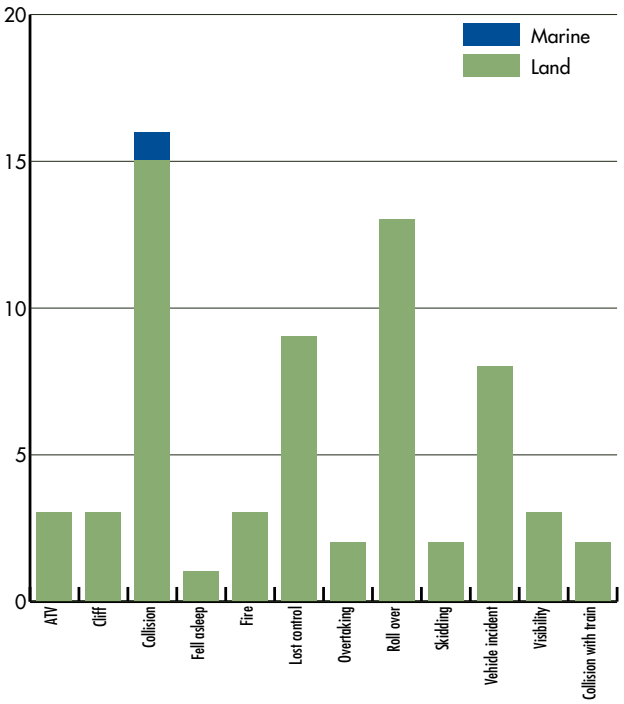
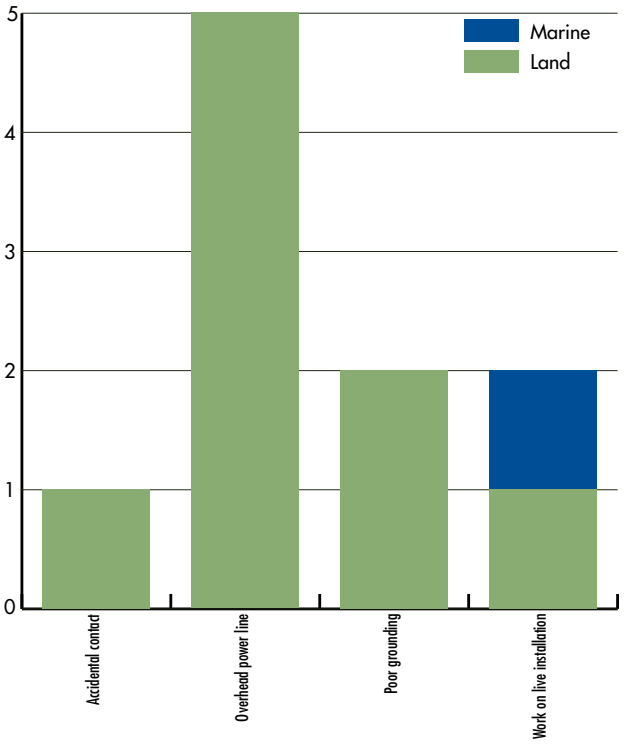
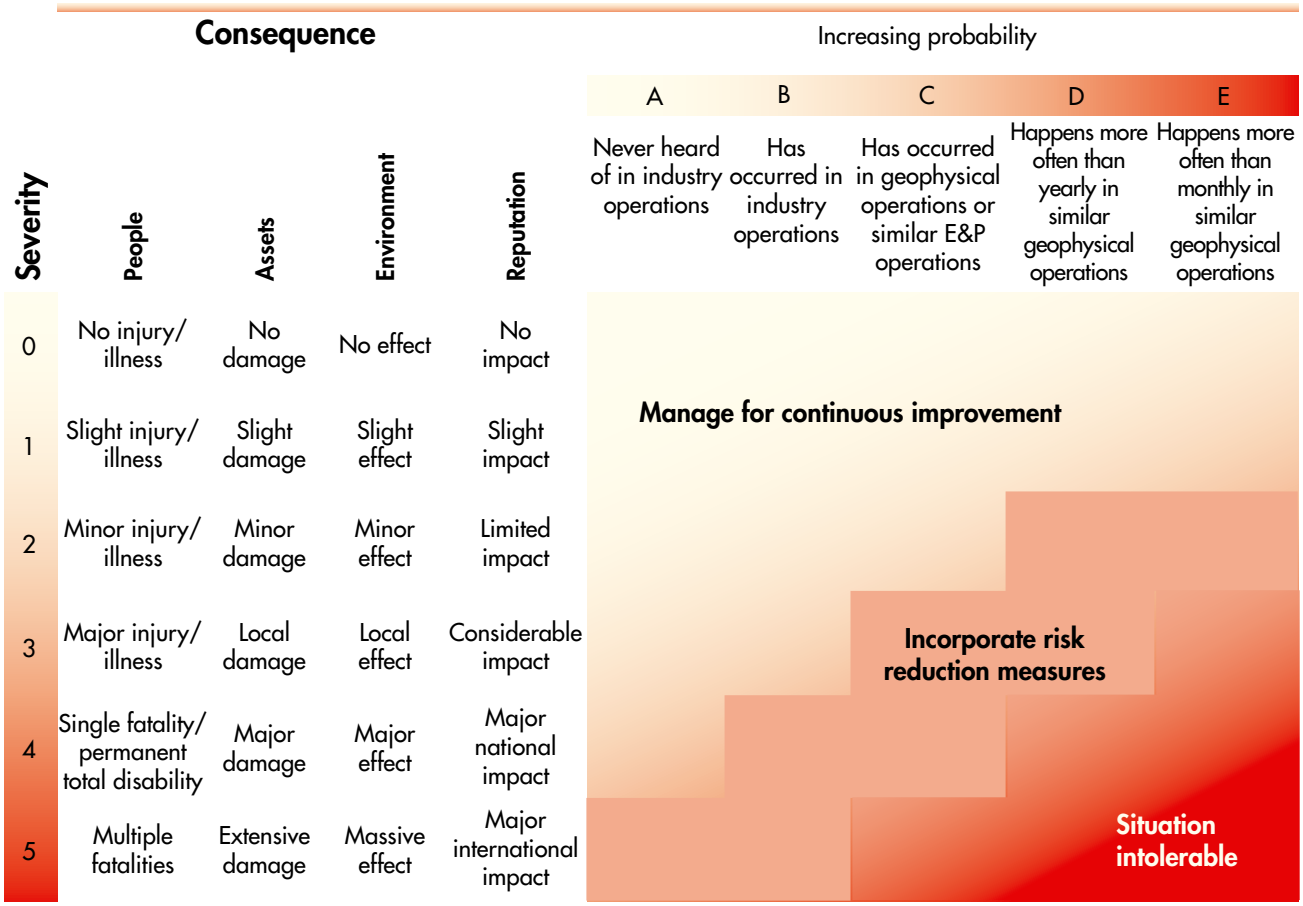


Figure 8 – Analysis of electrocution incidents in geophysical operations



Risk assessment matrix



The above risk assessment matrix provides a method to assess the level of risk posed by an identified hazard. Assessment is subjective and the use of a risk assessment matrix similar to the above helps to provide a basis for consistent assessment.

Health hazards will be identified by a Health Risk Assessment – HRA – that are specific to the project area. These should be managed in the same rigorous manner as other risks. Examples are malaria, yellow fever, dengue fever, and food and water borne diseases.

Appendix 4
Reference documentation

Management

M1	*Guidelines for the development and application of health, safety and environmental systems.* OGP report No. 210, July 1994.
M2	*HSE management – guidelines for working together in a contract environment.* OGP report No. 291 , October1999.
M3	*HSE competence assessment and training guidelines for the geophysical industry.* OGP report No. 292, June 1999.
M4	*Guidelines for HSE Auditing in the Geophysical Industry.* OGP report No. 245, September 1996.
M5	*Glossary of HSE Terms.* OGP report No. 244, September 1996.
M6	*Travel Guide.* IPIECA Report, 2007.
M7	*Hierarchy of Controls.* DNV Report.
M8	*ISM Code.* IMO Report.
M9	*Human Factors – a means of improving HSE performance.* OGP report No. 368, June 2005.
M10	*Aide-Memoire Fatalities Database.* IAGC website http://ww.iagc.org/AideMemoire/

Health

H1	*Substance abuse: guidelines for management.* OGP report No. 306, June 2000.
H2	*Health aspects of work in extreme climates.* OGP report No. 398, December 2008
H3	*Managing Health for Field Operations in Oil and Gas Activities.* OGP/IPIECA report No. 343, May 2003.
H4	*Guidelines for the control of HIV, Hepatitis B and C in the workplace.* OGP report No. 321, November 2001.
H5	*A guide to malaria management programmes in the oil & gas industry.* OGP/IPIECA report No. 382 2006.
H6	*Managing fatigue in the workplace.* OGP/IPIECA report No. 392, August 2007.
H7	*Managing workplace stress. A guide for oil industry managers & supervisors.* OGP/IPIECA report No. 378, May 2006.
H8	*Guidelines for medical aspects of fitness for offshore work, a guide for examining physicians.* UKOOA report, Jan 2007.
H19	*Guidelines for Drinking Water Quality.* Report WHO
H20	*Health performance indicators.* OGP/IPIECA report No. 392, January 2008
H21	*Guide to Food and Water Safety.* OGP/IPIECA Report 397, April 2009.

Environment

E1	*Environmental management in oil & gas exploration & production.* OGP report No. 254, May 1997.
E2	*Oil & gas exploration & production in mangrove areas – guidelines for environmental protection.* OGP report No. 184, November 1993.
E3	*Oil industry operations guideline for tropical rainforests.* OGP report No. 170, April 1991.
E4	*Oil & gas exploration & production in arctic regions – guidelines for environmental protection.* OGP report No. 329, 2002.
E5	*Guidelines for waste management – with special focus on areas with limited infrastructure.* OGP report No. 413, 2008.
E6	*Environmental Guidelines for World-wide Geophysical Operations.* Report IAGC 2000.
E7	*International Convention for the Prevention of Pollution from Ships.* Report MARPOL 1973 plus amendments.
E8	*Recommended Mitigation Measures for Cetaceans during Geophysical Operations.* IAGC 2009.
E9	*The American Table of Distances.* Report Institute of Makers of Explosives. Safety Library Publication 2 1991.
E10	*Minimum Offset Guidelines for Land Seismic Sources.* Report IAGC 2008.
E11	*Guidelines for waste management – with special focus on areas with limited infrastructure.* OGP report No. 413, September 2008

Security:

SEC1	*Firearms and the use of Force.* OGP report No. 320 2001.
SEC2	*Response to demonstrations at offshore facilities.* OGP report No. 309 2000.
SEC3	*Response to demonstrations at company premises.* OGP report No. 308 2000.
SEC4	*International Ship and Port Facility Security (ISPS) Code.* Report IMO 2003 plus amendments.
SEC5	*Piracy and Armed Robbery against Ships.* Report IMO MSC/Circular 623 Rev 3 2002.
SEC6	*Statement of Principles; Security of Seismic Operations.* Report IAGC 2008.

Safety – general

S4	*Guidelines on permit to work system.* OGP report No. 189, January 1993.
S20	*Lifting and hoisting safety recommended practices.* OGP report No. 376, April 2006.
S21	*Code of Practice for protection of structures against lightning.* Report British Standard BS6651 1999.
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 Publication 20, 2001.
S23	*A Note regarding safe diving distance from seismic survey operations.* Report IMCA DMAC 012 1979.
S24	*Code of Practice for converting vehicles for transporting survey personnel.* TRL Report Feb 2007

Safety – land

S3	*Land transportation safety recommended practice.* OGP report No. 365, April 2005.
S3-1	*Road hazard assessment.* OGP report No. 365-1, January 2006.
S3-2	*Journey management.* OGP report No. 365-2, January 2006.
S3-3	*Driver fitness for duty test.* OGP report No. 365-3, January 2006.
S3-4	*Road/vehicle accident checklist.* OGP report No. 365-4, January 2006.
S3-5	*Common land transport incident KPIs for MVCs.* OGP report No. 365-5, January 2006.
S3-6	*Questionnaire/checklist assessment for the implementation of report 365.* OGP report No. 365-6, January 2006.
S5	*Land Geophysical Safety Manual.* Report IAGC 9th edition 2004.
S24	*Code of Practice for converting vehicles for transporting survey personnel.* TRL Report Feb 2007

Safety – marine

S2	*Guidelines on the use of Work Boats in Marine Geophysical Operations.* Report IAGC 2001.
S6	*Marine Geophysical Safety Manual.* Report IAGC 9th edition 2004.
S7	*International Convention for Safety of Life at Sea.* IMO/ SOLAS consolidated edition 1997 plus ISM Code. ISBN 92-801-1433-6.
S9	*Guide to Helicopter/Ship operations.* Report International Chamber of Shipping, third edition 1989.
S10	*Watercraft & water in geophysical operations – a guide to operations & management.* OGP report No. 355, July 2004.
S11	*Loading of Lifeboats during Drills.* Report Step Change in Safety Committee 2003.
S12	*Service vessel marine safety guidelines.* OGP report No. 213, December 1994.
S13	*Offshore Helideck landing areas – Guidance on standards.* Report Civil Aviation Publication 437 2005.
S14	*International Convention on Standards of Training, Certification and Watch-keeping for Seafarers.* Report IMO 1995 amended.
S15	*International Maritime Dangerous Goods Code (IMDG).* Report IMO 1965 plus amendments.
S16	*Convention on the International Regulations for Preventing Collisions at Sea (COLREGs).* Report IMO plus amendments.
S17	*Guidelines for Vessels with Dynamic Positioning Systems.* Report IMO Circular MSC645.
S18	*Code of Safe Practices for Merchant Seamen.* Report UK Maritime and Coastguard Agency.
S19	*International Code of Practice for Offshore Diving.* Report IMCA D014 1998.
S25	*Diving recommended practices.* OGP report No. 411, June 2008.

Safety – aviation

S1	*Aircraft management guidelines.* OGP report No. 390, July 2008.
S8	*Helicopter guidelines for land seismic & helirig operations. OGP report No. 420, June 2009.*
S9	*Guide to Helicopter/Ship operations.* Report International Chamber of Shipping, third edition 1989.
S13	*Offshore Helideck landing areas – Guidance on standards.* Report Civil Aviation Publication 437 2005.

Appendix 5
Model HSE contract clauses

The following is an example of five articles of agreement, which can be incorporated into a tender/contract for geophysical operations, which make compliance with the HSE requirements of this guideline a condition of contract. However, the client and contractor will also be able to list any exceptions to these requirements. This will provide a consistent way for the client and contractor to review ITT and contracts established for the work.

Articles 4 and 5 contain examples of the application of exception clauses 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 shall, 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 shall 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 OGP report № 317, 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 shall 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 shall prevail. Standards defined under d) above shall 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 shall immediately notify client of such absence or inadequacy of defined standards. The client and contractor shall then jointly develop and agree on additional standards to cover the item or activity and reduce the associated Risk to As Low As Reasonably Practicable (ALARP) before the item or the activity is included or continued in the performance of the project. The client shall 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 organisations 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) shall 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			
1.3.3 Resources: manning levels	Manning levels should be defined appropriately as not to compromise safe execution of the operations.	Contractor shall have a full time, dedicated crew HSE advisor onboard the vessel for the whole duration of the project	
Table 2			
2.9.8 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 shall be placed as to be readily accessible in domestic areas, the work place and muster points.	SOLAS

Article 5 Example of possible contractor exceptions

	Minimum expectation for the implementation of an HSE MS	Remark, alternative or exception	Reference(s) to requirements
Table 2			
2.8.4 Vessel tracking system	A tracking system should be fitted to all small boats and watercraft operating in high risk environments (based on risk assessment) including but not limited to: a VTS central system/operator to monitor and control crew vehicle journeys in real time.	The workboats for this project are not fitted with an active VTS, but are equipped with GPS receivers.	

Table I – Minimum expectations for HSE management systems

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
1.1 Leadership and commitment			
1.1.1 Visible expressions of commitment by senior people.	HSE matters placed high on personal and collective agenda. All senior managers set a personal example to others. • Communicate the importance of HSE in business decisions. • Allocating the necessary resources, such as time and money, to HSE matters. • Setting a personal example 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. • Communicating the importance of HSE considerations in business decisions. • Recognition of performance when objectives are achieved. • Encouragement of employees' suggestions for measures to improve HSE performance. • Participation in internal and external initiatives.		M1
1.1.2 Line management Responsibility – empowerment of individuals (duty and right to stop work and intervention)	HSE is a line responsibility. Furthermore, management should empower all individuals of their duty and individual right to stop or intervene in any activity that could potentially harm people, the environment or assets – i.e. duty to stop work if you feel it's at risk. There should be no retaliation to implementation of this policy. Implementation of this policy by any person should not endanger others.		
1.1.3 Crew visits	Senior management have a defined schedule of visits to their crews. Crew/town/country-based managers/supervisors make regular visits to all operational work areas and sites.		
1.1.4 Crew HSE objectives.	The crew should have pre-determined goals and objectives which may include leading and/or lagging indicators, covering HSE (e.g. waste management). Supervisors and senior crew personnel have individually owned HSE targets and time-scales.		M1
1.1.5 HSE performance	HSE objectives and performance are measured and recorded. Senior management reviews corporate and crew HSE objectives and time scales.		M1
1.1.6 Senior management involvement in HSE matters.	Senior managers are actively involved in HSE matters: • They attend HSE meetings; • They personally instigate HSE Audits and reviews; • They promote a positive culture at all levels; • They recognise HSE performance when objectives are achieved.		M1
1.2 Policy and strategic objectives			
1.2.1 Content of HSE policy statements	Written HSE policies dated and signed by chief executive, which are in-line with the reference. Polices should include as a minimum: • Health, safety and environment; • Substance abuse; • Security; • Smoking; • Driving; • Transportation; • Right/duty to stop work if at risk; • Lone worker.		M2
1.2.2. Special policy focus	Lone worker implications should include operators such as lone drivers particularly where there is high statistical evidence of failure e.g. significant number of lone driver fatalities.		M10

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
1.2.3 Review of policy statement	A formal system should be in place to review policy statements on a scheduled basis and also to allow for changes in legislation and changes in key personnel endorsing those policies. The contractor and client will provide to each other any revisions or amendments issued during the term of the contract.		M1
1.2.4 Dissemination of HSE policies	HSE policies are effectively disseminated to the crew in-line with the reference. The main contractor and subcontractor(s) should be given a copy of the relevant client HSE policies.		M2
1.3 Organisation, resources, and documentation			
1.3.1 Corporate structure and responsibilities	The roles and responsibilities of the company are clearly defined, which include but are not limited to: • All managers and Supervisors with line responsibility are clearly charged with the responsibility for HSE; • Job descriptions are in place and easily accessible in a language the individual can understand, showing each employee's HSE function, competencies and responsibilities; • Availability of an organisational chart on the crew showing the relationships (client, contractor and subcontractors), including all HSE functions; • Feedback on personnel performance is provided.		M1 M2
1.3.2 HSE professionals	Client and contractor will agree the need for HSE supervisor support required for line responsibility. Contractor should have access to industry or client qualified HSE experts 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; • Health management; • Environmental management.		M3
1.3.3 Resources: manning levels	Manning levels should be defined appropriately as not to compromise safe execution of the operations.		
HSE Competence			
1.3.4 HSE competence and verification requirements	HSE 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.		M3
1.3.5 Induction programme	An induction program should be in place for visitors and new joining crew members. Visitor and new joining crew site induction programme should be preferably carried out on arrival on site and definitely within 24 hours.		S5 S6

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
1.3.6 Crew orientation programme	All personnel on site should receive an in-depth site orientation within 24 hours of arrival and before starting hazardous work on the crew. This should include but not limited to information on: • HSE policies; • Obligation to observe, intervene and stop; • HSE awareness; • Job descriptions and responsibilities; • Behavioural hazards; • Work instructions; • Basic survival; • Emergency procedures; • Incident/hazard reporting. Individual orientation records should be maintained.		M3
1.3.7 HSE training	Training requirements should be listed for each individual job. A current list of personnel who have completed training requirement should be maintained identifying any gaps. Training programmes should be designed to cover the requirements described within each module of the reference and be delivered by recognised trainers. A short service employee programme should be in place.		M2 M3
1.3.8 HSE training (advisors)	When the client and contractor agree the need for crew HSE advisors, they should meet the competence requirements stated in the reference and meet relevant local legal requirements.		M3
Contractors			
1.3.9 Ensuring HSE is part of contract objectives	Contract objectives should be defined to meet HSE 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.		M2
1.3.10 Subcontractors	The subcontractors involved in the project are included in HSE-MS, including but not limited to: • Subcontractors HSE capability assessment process in place; • The same expectations as the main contractor; • Subcontractors are part of the communication process; • Subcontractors are included in training programmes; • Subcontractors are part of the site reporting of near misses and incidents; • HSE performance of Subcontractors is monitored - objectives given, metrics agreed and tracked; • Subcontractors are included in Emergency response planning and arrangements.		M1 S5 S6 M2
Communications			
1.3.11 Communications of HSE information relevant to the project	Effective means of communications of HSE issues should be established between the client, contractor and subcontractors and other stakeholders: • Client's expectations on HSE management should be communicated fully to the crew; • Procedures should be established for the distribution of HSE documentation and for the reporting and review of HSE issues.		

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
1.3.12 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 use of visual media when literacy and/or multiple languages are an issue.		
1.3.13 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.		
1.3.14 Records	Records are kept of the main communications on HSE matters, e.g. • Training record; • Action register; • Meeting notes and minutes; • Audits; • Stop cards; • Investigations.		
1.3.15 HSE meeting programme	An effective hierarchy of HSE committees and meetings is defined and implemented, which should include but not limited to: • Records of meeting attendance where defined; • Regular HSE meetings for work units and skill pools (survey, drilling, vehicle and boat drivers etc.); • Daily toolbox meetings for work units and skill pools (survey, line opening, drilling, drivers etc. before starting work); • In addition toolbox meetings should be held before any non routine operation is started and risk assessment conducted when necessary; • Actions arising from meetings are communicated and tracked.		M2 M3
1.3.16 HSE promotion and awareness	Management regularly communicates on HSE to increase awareness: • Successes and failures are openly communicated to all employees; • Suggestions are recognised and acted on in a timely manner; • Systems are in place to recognise, reward and encourage success; • Participate in and promote industry sharing of lessons learnt e.g. safety flashes or alerts. And has a system to continually improve behaviour through observation, recording and coaching.		M2
HSE legislation, standards and documents			
1.3.17 Identification of HSE laws, rules and regulations	All applicable 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 S5
1.3.18 Obtaining HSE permits and authorisations	All HSE licences, permits, temporary permits and authorisations required by applicable laws, rules and regulations for the performance of the project should be obtained.		
1.3.19 Adherence to applicable laws, regulations, and permits	Client and contractor should adhere to all applicable HSE related legislation, rules, regulations and permits.		
1.3.20 Client HSE standards	Client should inform the contractor of any additional applicable HSE standards not already covered.		
1.3.21 Contractor HSE standards	Contractor should inform the client as to its HSE, equipment design, operational and maintenance standards and obtain agreement on their use during the performance of the project.		
1.3.22 Document control	HSE critical documents should be controlled documents, and should be regularly audited and monitored; e.g.: • Key responsibilities; • Crew HSE plan/project HSE plan; • Emergency plans; • HSE critical procedures; • PTW forms after job completion.		

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
1.4 Evaluation and risk management			
1.4.1 Risk management process (for generic and project specific hazards)	Assessment should be carried out for: • 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. Assessment process should include: • Hazard identification; • Ranking and recording all the relevant major risks; • Definition of prevention and mitigation measures; • Information on hazards and risks communicated to the crew. And should be based on a matrix such as provided in Appendix 3.		
1.4.2 Training and competence of risk assessors	The competence of those assessing risks should meet the standard in the reference.		M3
1.4.3 Risk reduction/control measures	An effective process for Risk reduction measures should be defined using the following hierarchy: • Safety by design • Elimination • Substitution • Reduction • Engineering • Administrative control • PPE • Recovery Responsible parties should be assigned to implement and maintain the controls. Risk reduction measures should be evaluated for unintended harmful consequences.		
1.5 Planning			
1.5.1 Planning at the client/ contractor and operational level for achieving HSE objectives	Planning is in place, which includes but not limited to: • Clear objectives set; • Means to achieve the objectives; • Resource requirements are defined; • HSE motivation programmes; • Performance feedback methods.		S5
1.5.2 Crew/project HSE plan	Documented crew and project HSE plans to be in place and inline with the reference guidelines given.		
1.5.3 Client/Contractor/ subcontractor interfaces	Client/contractor/subcontractors should develop and document Interface issues within the project plan or in a separate interface document. Especially in marine, where it's prevalent for the vessel operator to be a subcontractor of the seismic contractor, an interface document must 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 Health & Safety Management Systems Interfacing Guidance, Step Change, Issue 3

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
Asset, product and equipment integrity			
1.5.4 Process	All assets, products and equipment should be fit-for-purpose from an HSE perspective. Risk based integrity management should be carried out in accordance with the reference.		M1 IMCA CMID
1.5.5 Inventory	An inventory, to include a method to uniquely identify all assets, portable appliances, machinery and plants that require regular preventative maintenance should be available and regularly updated, including as a minimum all safety critical assets, products and equipment, as identified in the risk assessment process. Inventory to include unique identification numbers of all units.		S5 S6
1.5.6 Schedules	The preventative maintenance system should contain defined schedules, responsibilities and competencies pertaining to each item in the inventory which should include but not limited to: • Inventory planning to include additional units to allow rolling stand-downs for maintenance; • Go/no go directives from management for units overdue for servicing; • Management review of system; • Documented procedures in place for correct servicing of each unit as per manufacturers guidelines; • Documented schedules for servicing of each unit as per manufacturers guidelines; • Documented schedules for testing and re-certification of equipment where applicable; • Documentation that safety critical equipment has been checked by a competent person.		Relevant manufacturers' equipment maintenance guidelines
1.5.7 Record keeping.	The preventative maintenance system should contain detailed maintenance records. • Service record sheets to be completed with each service, signed off by the Responsible Person, and filed, to include: • Unit identification; • Work done; • Date; • Total km/miles/operating hours on unit where applicable.		
1.5.8 HSE equipment and inspection	Responsibility for the cost, provision, storage and maintenance of PPE will be agreed. An inventory of all HSE equipment should be developed and maintained. HSE equipment is subject to a regular inspection schedule.		M1 M2 S5 S7 Manufacturers' reccom'd

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
Procedures and work instructions			
1.5.9 Basic site specific HSE rules applicable to all personnel are available	A set of basic HSE rules should be developed and documented that are applicable to all persons on the crew. Rules should cover: • Safety, security, health and environment • When applicable, any other rules of conduct to ensure compliance with local regulatory requirements.		M2
1.5.10 HSE procedures for specialist and safety critical jobs	All specialist and safety critical jobs that require formal procedures or work instructions (e.g. require PTW or LOTO) have been identified and documented. Job descriptions for senior and HSE critical personnel should refer to relevant procedures. 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. For offshore operations, a diving procedure should be in place, just in case, even though diving will not be part of routine operations or an identified third party activity in the area.		S23 S25
1.5.11 Lockout/tagout	A LOTO system should be in place that conforms to the referenced guidelines. • The method of isolation and discharge of stored energy will be agreed and executed by a competent person/s. • Any stored energy will be discharged. • A test will be conducted to ensure the isolation is effective. • Isolation effectiveness will be periodically monitored. LOTO procedures should be used for work on all stored energy systems, including HP air systems.		S5
1.5.12 Permit to work	A PTW system should be in place that conforms to the referenced guidelines. Routine jobs that are not controlled using a PTW system must be risk assessed and be covered by a procedure if necessary Completed PTW forms shall be kept as controlled documents.		S4 M3 S5
1.5.13 Working at height	Working at height above 2m (6 ft), or a lesser height where a fall may result in serious injury, should be subject to a PTW system. This includes over the side working on vessels. In such cases a 'Fall Protection Plan' should be in place.		S5
1.5.14 Revision of procedures, work instructions and HSE rules	A procedure should be in place for: • Periodic revision; • Involving users in the revision; • Disseminating updates.		M2

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
Management of change			
1.5.15 Procedures	The deployment of management of change procedures is required when significant change occurs or is proposed, from the circumstances or assumptions underlying the crew HSE plan or project HSE plan. Work arising from temporary and permanent changes to organisation, personnel, systems, process, procedures, equipment, products, materials or substances, and laws and regulations cannot proceed unless a management of change process is completed, where applicable, to include: • A risk assessment conducted by all impacted by the change • Appropriate specialist advice should be sought during the consideration of the change • 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 – Training, personnel and communication – Documentation • Authorisation 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 will be implemented. • A process of recording any learning from the MoC effectiveness. Where a temporary change has been applied: • There should be verification that the change has reverted within the specified time frame; • Capture any learning e.g. were there issues with implementation; was the change actually needed?		
1.5.16 Risk assessment	Explicit review and documentation of any new or changed HSE risks resulting from change. Applicable to major changes (e.g. restructuring or different procedure).		M1
Emergency planning			
1.5.17 Development of emergency plans and procedures	Contractor/client/subcontractor should develop, document, and maintain plans for responding to potential emergencies, which should cover but not limited to: • Procedures; • Organisation; • 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 authorised 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.		S5 S6
1.5.18 Crisis management	Client/contractor/subcontractor shall define specific responsibilities in case of crisis.		
1.5.19 Communication facilities and procedures	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). Vessels and remote operations should have 24 hour per day recourse to assistance from a shore/town support organisation.		S5 S6
1.5.20 Procedures for major emergency situations	An overall emergency plan should be developed covering all relevant emergency scenarios, listing procedures to be followed and resources to be available in the case of emergency.		M1 M2 S5 S6

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
1.6 Implementation and monitoring			
1.6.1 Realistic and challenging, reactive and proactive HSE objectives set at corporate and project level.	Documented corporate, country, and project HSE performance metrics should be in place: Objectives to be specific, measurable and attainable; Documented definitions of metrics used for measuring performance to be available.		M1 M2 H20
1.6.2 Crew ownership of, and commitment to performance objectives	HSE objectives are determined by those directly involved in their achievement whenever possible and endorsed by management.		M1
1.6.3 Behavioural based safety programmes	Client/contractor/subcontractor will recognise the impact of the impact of human factors in the management of HSE and have in place a system to address these issues and improve HSE performance		M9 H6 H7
1.6.4 Monitoring and reporting of corporate and project HSE performance	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 H20
1.6.5 Self assessments/inspections	Each work unit, site or operational entity should have inspection schedules which are used regularly		
Incident investigation			
1.6.6 Incidents to be investigated	All incidents should be 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
1.6.7 The investigation and reporting team	Procedures in the project plan and/or Interface document should define the trigger points for when an investigation should be initiated under both the client and contractor's HSE-MS. Composition and competencies of the investigation team (client/contractor balance) along with a planned mobilisation 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 lead the investigation team.		M1 M2 M3
1.6.8 Actions to be taken immediately after an incident	Information will be gathered before it is lost. This includes but is not limited to: • Identify witnesses and obtain statements; • Take pictures and/or sketches/measurements of evidence that may be destroyed by weather, or may need to be moved; • Perform substance abuse tests where appropriate; • Isolate parts, tools or equipment involved in the incident; • Isolate the incident scene where possible; • Check gear, switch positions, fluid levels, and safety devices of any equipment involved in the incident.		M1 M2 H1
1.6.9 Actions to be taken by investigating team after assembly at site.	Incident investigation procedure should include but is not limited to the following: • Allocation of individual responsibilities to team members; • 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; • Determining and list corrective actions and/or recommendations with named action parties and defined completion dates; • Naming of action party and date for follow up on entire set of corrective actions and/or recommendations.		M1

	Minimum expectation for the implementation of an HSE-MS	Remark, alternative or exception	References
1.6.10 Lateral learning from incidents	Investigation reports should be issued promptly and include identification of learning and critical information that requires dissemination. Contributing factors and root causes should be included. HSE-MS should include a formal system whereby lessons learnt from Incident investigations, are communicated throughout the organisation, and, where appropriate, should be shared with the industry (e.g. via IAGC safety alerts), and system should require use of these lessons in planning future operations or risk assessments. Risk assessment(s) should be re-examined or new ones developed as appropriate.		
1.6.11 Follow up of incidents	A focal point should be assigned to ensure all corrective actions and/or recommendations are addressed and closed out.		M1
1.7 Auditing and reviewing			
1.7.1 Audit plan	Contractor should have an internal HSE audit plan that covers the entire scope of the project including operations managed by subcontractors in line with the reference.		M4
1.7.2 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; • The audit criteria against which the audit findings will be assessed.		
1.7.3 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 be composed to possess an appropriate combination of knowledge, skills, understanding, personal qualities and experience to carry out their responsibilities to fulfil the scope of the audit.		M3
1.7.4 Independence	The team should be objective and free from conflict of interest, although it may include representative(s) from the activity to be audited.		
1.7.5 Audit process	The audit process should comply with the reference.		M4
1.7.6 Close-out and corrective actions	The final audit report and corrective actions should be delivered in a timely fashion. The auditee is responsible for corrective action plans and status reports.		
1.7.7 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 continual improvement.		
1.7.8 Final evaluation and close out	Client/contractor/subcontractor management should meet to review the performance of the project addressing: HSE evaluation; HSE performance report; Lateral learning and recommendations for future projects.		M2

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

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.1 Safety critical equipment & activities			
2.1.1 Equipment inventory	An inventory of all equipment, machinery and plants that require regular preventative maintenance should be available, e.g.: • Vehicles • Vessels • In water equipment • Small boats, engines • Generators • Trailers • Fire detection and control equipment • Medical equipment • Air conditioners/heaters • Cranes, winches, hoists • Workshop equipment (i.e. welding sets) • Compressors • Water pumps • Chainsaws • Drill units • Water and waste treatment plants • All terrain vehicles • Aircraft and helicopters • Bulldozers etc. • Snowmobiles Inventory to include unique identification of all units.		S5 S6 E5 E11
2.1.2 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 involved • Identify all power sources • Utilise unique locking devices • Tag out all power sources and machinery • Identify PTW Training requirements.		S4 S5 S6
2.1.3 Energy isolation	Any isolation of energy systems; mechanical, electrical, process, hydraulic, pneumatic and others, cannot proceed unless: • The method of isolation and discharge of stored energy are agreed and executed by a competent person(s) • Any stored energy is discharged and its absence confirmed (zero energy state); • A system of locks and tags is utilised at isolation points • A test is conducted to ensure the isolation is effective Isolation effectiveness is periodically monitored.		S5 S6
2.1.4 PTW	PTW should not extend across shift changes. A PTW system should be in place that complies with the referenced guidelines. Routine jobs that are not controlled using a PTW system must be Risk Assessed and be covered by a procedure if necessary. A log book of PTW forms issued will be maintained and archived for a minimum of twelve months.		M3 S4 S5 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.1.5 Working at heights, land and marine	Working (regular or predictable access to a location, e.g. for maintenance) at heights of 2 metres (6 feet) or higher, working in a location where there is exposure to a fall from height, or where a fall from a lesser height would be onto a dangerous surface, cannot proceed unless these specifications are met, or a controlled access zones procedure is in place where conventional fall protection methods cannot be used. All personnel should be made aware of the dangers of jumping from height and of the wearing of items of jewellery (rings; necklaces etc) • Fall protection plan in place; • A fixed platform is used with guard or hand rails, verified by a competent person(s) or; • Fall prevention or work positioning by short lanyards (i.e. prevent a fall from starting) or; • Fall arrest equipment 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 • Fall arrest equipment will limit free fall to 2 meters (6 feet) or less. • A visual inspection of the fall arrest equipment and system is completed and any equipment that is damaged or has been activated is taken out of service • Person(s) are competent to perform the work. • Suitable rescue equipment for rescuing persons working at heights and personnel trained in its use available.		S5 S6 M3
2.1.6 Edge protection	Edge protection (barrier to falling) where there is a risk of falling into water or from height.		M10
2.1.7 Ladders	Work (exceptional, infrequent or unique) requiring a ladder is considered working at height and should be authorised and controlled. Special construction ladders designed for specific purpose in a proven and approved operation may be used if properly maintained and used according to manufacturers instructions (e.g. aircraft maintenance access step ladder).		
2.1.8 Confined space entry	Entry into a confined space cannot proceed unless the specifications are met: • All other options have been ruled out • PTW is issued with authorisation by a responsible person(s) • PTW is 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 and repeated as often as defined by the risk assessment • Personal oxygen/gas detectors are working • Secure lines of communication are established between worker, standby person and rescue personnel. • Stand-by person is stationed at the entrance of the confined space (buddy system) • Unauthorised entry is prevented. Confined Spaces include: • Spaces not normally ventilated, most commonly, but not limited to, tanks used for storage of liquids; • Spaces from which egress or escape may be difficult, or where persons may become trapped.		M3 S5 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.1.9 Excavation and ground disturbance	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 hazards, i.e. pipelines, electric cables, etc. have been identified, located and if necessary isolated. • Plan and agree design of excavation taking into consideration heavy equipment use • 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.		
2.1.10 Lone worker	A specific focus regarding the duty of care must be applied to Lone worker situations. An example definition of lone worker is: *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.* Employers should identify where people may work alone and hazard analysis and risk assessment should be applied and recorded. Example of considerations: • Does the workplace present a special Risk to the lone worker? • Length of time the person will 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 made.		

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.2 Emergency response planning			
2.2.1 Procedures for major emergency situations	The emergency situations should include at least any of the following that may be applicable to either or both land operations or marine operations: • Fire for facility/vessel/camp • Abandon ship • Extreme weather; • Fuel/chemical spill • Aircraft/helicopter emergencies • Medevac • Fatality • In-water emergency (e.g. loss of propulsion or steering) • Collision/vessel grounding • Rescue or workboat Emergency recovery • MOB • Man lost/search and rescue operation (SAR) • Vehicles (e.g. collision or rollover) • Evacuation • Security: – Interference from activist groups – Civil disturbances – Criminal activity – Piracy – Hi-jacking – Kidnapping – Sabotage – Terrorism. Community mitigation should be included in plans where appropriate. Consider and provide for the management of potential stresses resulting from any incidents.		M1 M2 M8 S1 S3 S5 S6 S7 SEC4 SEC5 SEC6
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 to fulfil their job in developing emergency plans and during emergency situations: • Personnel assigned jobs with physical exertion (e.g. fire crews) should have medical examinations specific to that role such as provided in the reference • Master and first mate should have IMO command and control of emergencies training. • Party chiefs, operation managers • Fire crews land operations • Fire crews marine operations – each vessel should have a fire fighting crew of at least 4 persons with four days dedicated advanced fire-fighting training from an IMO recognised institute • Fire crews helicopter operations – HLO and two assistants should have 2 days helideck fire-fighting training from IMO recognised institute • Medic or doctor.		M3 S7 H8
2.2.3 Emergency systems for fires on vessels	System to detect and protect from fires on vessels should be inline with reference and the following: The preferred type of fixed fire detection system is the self-monitoring type. Fixed fire fighting systems should be installed in areas of risk including, but not limited to: • Over streamer reels; • Streamer storage areas; • Paint storage areas; • Tape store rooms; • Engine spaces, generator rooms and compressor rooms.		S6 S7

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.2.4 Emergency systems for fires onshore	See requirements in section 2.15.13		
2.2.5 Abandon ship	Abandon ship, in water emergency and MOB: compliance with reference:		S7
2.2.6 Medical emergency response times	Medical emergency plans (medevac) should meet the following response times: • 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 – specialist/hospital doctor (preferred) (level 5). If this is not feasible then a risk assessment should determine what additional resources are needed and can be applied, to mitigate sufficiently to permit continuation of the project.		
2.2.7 Safety and survival training	All persons including personnel assigned on behalf of the client should receive the relevant survival training before beginning work in the field. For marine operations this should be a recognised training course 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.		M3
2.2.8 Helicopters working over water	HUET training is required for personnel flying on helicopters over bodies of water.		M3
2.2.9 Emergency response plan, checks and tests	All emergency procedures relevant to the operation should be practised on a regular basis. The difference between practice and rehearsal (exercises) and testing (drills) should be identified and applied. When the conditions do not pose a risk to the safety of personnel then an emergency test should be conducted: • All tests should have clearly defined scope and scale; • Tests should be followed by a debriefing and a documented evaluation. • Response times should be monitored and where relevant, trended against pre-defined performance objectives; • The frequency of tests should be reviewed regularly; • Tests should occasionally be carried out without warning but announced as 'a test' to avoid panic.		S6
2.3 Contracted services			
2.3.1 Subcontractors	Subcontractors involved in the Project shall adhere to all contract requirements and be included in the HSE-MS. Their involvement should include, but not limited to: • Subcontractors capability assessment process in place • Subcontractors are part of the communication process • Subcontractors are included in training programmes • Subcontractors are part of the site reporting of incidents • HSE performance of subcontractors is monitored – objectives given, metrics agreed and tracked. • Vehicle, driving, tracking and monitoring requirements • Journey management.		M1 M2 S5 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.4 Occupational health and medical care			
2.4.1 Impact and risk assessments	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. • 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') The HRA will assist in defining: • Surveillance programmes • Awareness and education programmes, e.g. HIV awareness training. • And guidance on: • Immunisation & chemoprophylaxis programmes; • Types and methods of surveillance; • Need for appropriate medical evacuation insurance to ensure evacuation of patient to quality medical care in emergencies. In malaria endemic areas, there should be a Malaria Management Programme (MMP) in place. Elements of the MMP should include, but not be limited to: • Awareness training for personnel; • Bite prevention measures (i.e. sprays, netting, long sleeves and trousers); • Chemoprophylaxis suitable for type of malaria (e.g. Malarone, Doxycycline, Larium) • Early diagnosis of symptoms and treatment. The HRA should be specifically referred to when establishing the emergency response plan.		M5 H4 H5 H7 H21 E5 E11
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.		
2.4.3 Occupational health risks	The HRA should include an evaluation of possible job specific health hazards. Some new technology examples: • High voltage systems – AUV/EM operations • Potential effect of high voltage in proximity to personnel • Electrolyte in use for AUV operations, splashing when refilling. Other examples include, but are not limited to: • Noise • Food hygiene • Water quality • Ultra-violet light (sun light) • Vibration • Chemicals • Poor ergonomics		• H21

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.5 Medical resources (facilities and staff)			
2.5.1 Facilities, medical equipment and essential medicines	The standards of medical facilities to be provided must be professionally reviewed and be based on the recommendations of the reference, data from the HRA and relevant for the medical emergency response times outlined in 2.2.6. The following (where relevant) need to be identified and considered: • Land base camps • Fly camps • Ambulances (vehicle and boat) • Land/TZ line units medical kits • Marine seismic vessel • Support vessels operating close to main vessel • Shallow water/TZ mother vessel/barge • Type of energy source.		H3
2.5.2 Trained health personnel	Compliance with the reference and commensurate with the HRA output, and addressing where relevant remote line units requirements		
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		H3
2.5.4 Remote medical support	The crew should have access to 24/7 remote specialist medical advice and support.		
2.6 Personal health			
2.6.1 Life style 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.).		S5 S6
2.6.2 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 throughout the working 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.		S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.6.3 Substance abuse	A policy should be in place that recognises 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 organised, 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.		H1
2.7 Health and hygiene standards for camps and other living areas			
2.7.1 Accommodation facilities	The crew accommodation should be designed, constructed and maintained to meet the following criteria: • Adequate protection against wind (including founding or tethering structures against extreme winds) moisture and extreme temperatures; • Designed to prevent ingress of insects, pests, live stock and wild life; • Provide adequate lighting/ventilation and temperature control; • Separate bed for each person with free floor access between beds or bunks; • Space for safe storage of personal possessions; • Adequate laundry facilities; • Provision of carbon monoxide detectors where potential sources exist; • Smoke detectors • Adequate escape routes • Emergency cut off for electricity • Avoidance of food in sleeping accommodation.		S5 S6
2.7.2 Domestic animals	Pets and other domesticated animals should be prohibited from all crew facilities		
2.7.3 Toilet and sanitary Facilities in base and fly camps	The crew toilet and sanitary facilities should be designed, constructed and maintained to meet the following criteria: • Washable floor for base camp facilities (not required for fly camps); • 1 toilet, wash hand basin and shower per 15 employees; • Adequate supply of water and adequate drainage; • Hot and cold water to wash basins and showers in base camps; • Adequate soap to be supplied to all communal sanitary conveniences.		
2.7.4 Sewage, grey water disposal	Compliance with guidelines, requirements and practices in the reference document.		E6
2.7.5 Cleaning and housekeeping	Procedures should be established for camp cleaning which include: • Cleaning schedules and their scope; • Monitoring and inspections programmes; • Pest control.		S5
2.7.6 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, with water samples taken from several points of use.		S5 H9 H21
2.7.7 Kitchen/galley facilities	The crew kitchen/galley facilities are designed constructed and maintained to comply with the reference.		S5 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.7.8 Eating places and provision of meals	The Crew meal provision service is designed, constructed and maintained to meet the following criteria: • The number of persons and shift model should be adequately provided for in the catering arrangements including reasonable eating conditions and timing. • At least two meals per day, one being hot.		H21
2.7.9 Food handlers	The crew food handlers should have: • Medical examinations every 6 months (may be subject to local regulations). • Valid medical certificates • Received food handling training • PPE catering clothing issued and used		M3 S5 S6 H8 H21
2.7.10 Food supplies and storage	The food provided should meet the following criteria: • Quantity and quality adequate; • Is in date (shelf life adequate); • 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.		S5 S6 H21 E5 E11
2.7.11 Food preparation, and cooking	During food preparation, a food segregation system is in place.		S5 H21
2.8 Work environment and hazardous materials			
2.8.1 HRA and Hazardous environments and materials	The controls recommended by the HRA relating to hazardous materials and other agents should be in place and the identified specific risk areas should be addressed.		MSDS
2.8.2 Carcinogens and other toxic materials (benzene, chemicals, paints, oils, diesel exhaust)	The crew line management should have awareness, knowledge and understanding in the management of hazardous materials. There should be an accurate and current inventory of all products requiring MSDS. MSDS should be provided at least in locations: • Of common and easy access to all crew members; • At any locations of regular storage; • At any locations of regular use; • In any site clinic. MSDS should include but not limited to: • Labelling; • Work practices; • Separate storage; • PPE; • Recovery and medical treatment.		M3 S5 MSDS
2.8.3 H_2S (oil installations and sewage plants)	If there is a risk of exposure to H_2S, controls should be in place, including but not limited to: • Recognised H_2S Training; • Portable H_2S alarms; • Breathing apparatus available; • Wind socks; • PPE as required; • Personnel are aware of appropriate escape routes; • ERP.		S5

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.8.4 Dusts; (desert dust, abrasive materials, asbestos)	Information and induction briefings should be provided as well as the appropriate PPE. The presence of asbestos should be formally recorded and advice posted with certification describing: • Type • Applicable restrictions Only registered specialists can remove asbestos unless the type of asbestos is certified otherwise.		
2.8.5 Noise	The following should be available on the crew to manage noise risks: • Information on the noise generated by equipment; • Noise assessment surveys results; • A noise meter of appropriate type and valid calibration; • Information and signage; • PPE (hearing protection) and PPE wearing rules.		ISO 2923
2.8.6 Cold climates (heat loss)	Procedures should be in place for working in the cold including the provision of suitable PPE.		H2 S5
2.8.7 Hot climates (heat stress)	Procedures should be in place for working in hot climates.		H2 S5
2.8.8 Ergonomics	The HRA should include the relevant ergonomic aspects, including but not limited to: • Assessment of VDUs/instrument room ergonomic design and lay out; • Assessment of musculo-skeletal strain (lifting, working in difficult terrain) to include: • Provision of lifting and handling training; • Provision of lifting and handling aids. • Identification of an appropriate maximum weight limit for normal lifting is encouraged.		M3 S5 S6 H3
2.8.9 Working hours and working schedules	Crew working hours and working schedules will meet the following: • Compliance with the relevant regulations; • 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; • Adequate care and planning given to the provision of rest, with a maximum shift length of 26 weeks. • Fatigue management should be applied in assessing work schedules.		S3 S5 S6 H6
2.8.10 Medical fitness checks	Medical fitness checks should be recorded and cover the following aspects but not be limited to: • The pre-employment fitness standards; • Pre-employment medical to confirm fitness for the job assigned; • Pre-employment substance abuse testing for safety critical positions; (all marine personnel considered safety critical) • Medical checks during employment at a frequency depending on risks associated with employment role.		H1 H3 H8

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.9 Natural & man made hazards			
2.9.1 Lightning	Procedure for people to follow when there is risk of lightning. 'Lightning procedure' to be in place.		S5 S21
2.9.2 Drowning	Drowning is currently the second highest cause of fatality in the geophysical industry and occurs mostly in land operations. 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		M10 S25
2.9.3 Weather, terrain, flora and fauna	The relevant natural hazards should be identified and assessed and effective control and recovery measures should be in place, including where relevant: • Which activities will be permitted in adverse weather; • 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, quicksand); • Avalanche (snow, ice, rock, mud); • Tides and currents (river bores, coastal effects); • Bush fires; • Fauna (venomous, poisonous, aggressive); • Flora (poisonous, penetrating [sharp], barrier).		S5 S6 H5
2.9.4 Shallow water marine	In shallow water survey areas a documented procedure will require: • Accurate and up to date bathymetry • Side scan surveys • Satellite imaging • Up to date charts • Tidal charts • Any available depth hazard information (obstacles, pipelines) and EIA information from the client • Resource management • Redundancy/calibration & reliability of equipment • Scouting and escape routes.		
2.9.5 Overhead power cables	Awareness, crews should have procedures in place when working in such areas. The use of hazard line maps is suggested.		S5

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.10 Environment			
2.10.1 Environmental Impact Assessment (EIA)	EIA undertaken on the behalf of the client should be made available to contractor at the tender stage. The EIA findings should be reflected in the project HSE plan.		E6
2.10.2 Social Impact Assessment (SIA)	SIA undertaken on the behalf of the client should be made available to contractor at tender level. SIA may be separate or as a combined assessment with EIA. The SIA findings should be reflected in the project HSE plan.		E6
2.10.3 Project Environmental Management Plan (EMP)	The contractor should develop environmental objectives, performance criteria and implement an EMP to meet relevant legal and regulator requirements and for those other environmental aspects considered to be significant to the project: • Contractor and crew management should have an environmental management competence profile in-line with the reference. • Recommendations of relevant IAs should be taken into account when developing the crew EMP; • The controls, including training, should be implemented to maintain the agreed performance standards for each hazard and any recovery measures necessary to minimise any significant effects on the environment under operational and also emergency situations. • The controls (mitigation measures) will as a minimum be in compliance with relevant sections of references.		M3 E1 E2 E3 E4 E5 E6 E9 E10
2.10.4 Specific Waste Management Plan (WMP)	Contractor should develop a specific WMP as part of the EMP for the project, which should be implemented at crew level in compliance with the references • Regulatory requirements including MARPOL; • Controls identified by EIAs and any environmentally significant aspects that have been identified by client, contractor & subcontractor. The EMP should include: • Confirmation of a formal and documented process of selection and monitoring of waste disposal subcontractors and include. – Focus on minimising the handling, transportation and cross border export of waste for dumping purposes. – Emphasis recycling opportunities and the use of biodegradable materials.		E5 E7 E11
2.10.5 Non-hazardous waste from geophysical activities	WMP to 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 tone cartridges, tapes and disks). • Biodegradable detergents and products qualified as non-hazardous, to be used, where at all possible.		E5 E6 E11
2.10.6 Hazardous waste from geophysical activities	WMP to 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 into surface water courses. • Toxic materials (PCBs etc) • Approved waste disposal agencies should be identified and used wherever available. • Documentation confirming appropriate safe disposal of hazardous waste (e.g, receipts from licensed waste management subcontractors) shall be retained. Where new technology provides new hazardous waste, good practice should be maintained. An example would be waste fuel from AUV.		E5 E6 E11

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.10.7 Stakeholder mapping including the interaction of the project with third parties	Responsibilities shall be clearly identified and agreed between client/ contractor/subcontractor. Assess and document the third party activity 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 media and public relations. • Interaction with fishing vessels and general shipping; • Interaction with other oil and gas related operations; • Interaction with the general public; • Interaction on public highways; • Interaction with farmers and/or their animals. For execution of the project agree on what should be done by client and what should be done by contractor including, but not limited to. • Obtaining formal permission for access to prospect area • Fair and prompt compensation for damages resulting from the Project • Grievance procedure		M3 E6
2.10.8 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 minimise 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.		S5 E6
2.10.9 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 minimise leaks of ozone depleting refrigerants from items of equipment.		S6
2.10.10 Marine life and sound	In addition to applicable legislation designed to protect the marine environment, initiatives and use of best available practices based on project specific risk assessment is required. For example: • Training for personnel in the ecology of marine environment and marine life • Visual & electronic monitoring • Onboard Marine Mammal Observers (MMOs) • Reporting • Shut-downs (for whales, turtles etc) • Soft starts • Turtle guards on tailbuoys and similar streamed equipment.		E8

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.11 Land transport			
2.11.1 Integrated project transport plan: Land and marine	An integrated transport plan (logistics) is recommended. This plan should: • Focus on reducing transport exposure; • Take into account the road/river/water hazard identification for the area; • Highlight all client, contractor and subcontractor vehicles/craft involved with the project. Where the operation involves the use of Subcontractors vehicles/craft there shall be: • Pre-qualification. • Auditable compliance with contract standards. Driver working hours should be recognised as part of a labour intensive HSE critical job and adequate rest hours should be planned. Any loading and home travel time to be taken into account.		S3
2.11.2 Vehicle type; selection; design	Assessment and inventory to cover: • Type, number of units, allocation of units; • Diesel powered when possible; • Load limits defined and marked; • Speed limits on and off road defined and communicated • Recommended tyre pressures • Segregation, positioning and securing of freight; • To be used off road yes/no; • For carrying passengers yes/no • Passenger seating arrangement and maximum capacity. • Exotic modes of transportation should be agreed between client and contractor • Application of speed limiting devices, if and where appropriate.		S3 S5
2.11.3 Wheel design	Fatalities have occurred when inflating certain types and designs of wheels. Wheels constructed of several parts including a securing ring ('multi piece'or 'split rim') should not be used where suitable single rim types are available. Where multiple piece or split rims are unavoidable, appropriate protection is required when inflating tyre during assembly and fitting (e.g. wheel and tyre cage). Drivers of vehicles using these rims should be given training for the repair/assembly of this type of rim.		
2.11.4 Passenger restraint, roll-over prevention and protection, and other protective measures (mini-buses; crew buses;coaches)	Compliance with guidelines, requirements and practices in the reference documents. Advantage should be made of new technology and vehicle design and manufacturing improvements. (e.g. roll over prevention designed into steering and suspension systems and roll over protection designed into the vehicle construction and side air bag curtains). Reversing alarms should be fitted to vehicles wherever practical. 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.		S3 S5 S24
2.11.5 Carbon monoxide poisoning/ exhaust fumes	CO detectors/alarm in drivers' cabs and passenger compartment of vehicles that may be kept stationary with engines running to power peripheral equipment such as heaters, lights and air-conditioning.		S5 S6
2.11.6 Special vehicles and situations	Hazard identification and risk assessment conducted to decide need for special protection e.g.: • Roll over cage and protective canopy for bulldozer driver cab to protect from falling objects such as trees as well as roll over. • Enclosed and pressurised cab where there are Africanised bees and high dust levels		
2.11.7 In vehicle monitoring (IVMS)	Vehicles should be equipped with IVMS (VDR), (as per reference document)		S3

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.11.8 Vehicle Tracking System (VTS)	A vehicle tracking system (VTS) should be fitted to vehicles operating in high risk situations (as identified and agreed upon by the client/ contractor/subcontractor) which includes, but is not limited to: • A VTS central system/operator to monitor crew vehicle journeys in real time.		S3 S5
2.11.9 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.		S3 S5
2.11.10 Preventative maintenance	All vehicles should be subject to a documented preventative maintenance programme		S3
2.11.11 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).		M3
2.11.12 Equipment	Adequate and appropriate tools, equipment and facilities should be available to allow for proper repair and maintenance of vehicles and their ancillary equipment.		
2.11.13 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.		
2.11.14 Drivers competence and selection	Driver competence should be assessed and documented including, where required and/or appropriate, their: • Physical, (medical examination including a 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.		M3 S3
2.11.15 Driving permits and records	Driver records should be maintained, including: • Personal and employment details; • Types of vehicle licensed to drive; • Operating conditions (terrain) approved to drive; • Types of cargo licensed to carry.		S3 S5
2.11.16 Driver induction and training	Driver training should be inline with the references. Reassessment criteria are addressed in referred documents.		M3 S3
2.11.17 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.		M3 S3
2.11.18 Pedestrian vulnerability	High visibility reflective vests to be worn by all personnel outdoors on land operations.		M10
2.11.19 Third party awareness of crew traffic risks	Briefings should be given to relevant third parties and local communities on land transport safety.		S5
2.11.20 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.		

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.11.21 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.		
2.11.22 Journey management	Compliance with guidelines, requirements and practices in the reference document including a documented procedure covering: • Road hazard identification • 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 surfaced road 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.		M3 S3 S5
2.11.23 Additional requirements for different types of vehicles and operations	Compliance with guidelines, requirements and practices in the reference document for. Appropriate training should be agreed for operators: • All Terrain Vehicles, (ATV's); • Snowmobiles; • Vibrators • Tracked vehicles • Buggies • Small utility vehicles ('Mule', 'Rhino', etc.)		
2.12 Water transport			
2.12.1 Design considerations	The design of small boats and watercraft used for geophysical operations should be in accordance with the relevant sections in the reference.		S2 S10
2.12.2 Inventory	An inventory of all small boats and watercraft on the crew should be maintained and should as a minimum include: • Type, size and capacity; • Built-in buoyancy characteristics; • Load limits; • Maximum passenger capacity.		
2.12.3 General safety equipment	All small boats and watercraft should as a minimum comply with the equipment guideline in the reference document.		S2 S6 S10
2.12.4 Vessel tracking system	A tracking system should be fitted to all small boats and watercraft operating in high risk situations (based on risk assessment) including but not limited to: • A VTS central system/operator to monitor and control crew journeys in real time.		
2.12.5 Small boat maintenance	Small boat and watercraft maintenance should be carried out in accordance with the reference.		S2 S10

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.12.6 Competence	All small boat drivers/coxswains and crew should be competent for the type of craft they are operating in accordance with the reference. A system should be in place to maintain and track the competence of the coxswains.		M3
2.12.7 Driving permits and records	Driver/coxswain and crew records should be maintained and should include: • Personal and employment details • Types of boats the coxswain is licensed to drive.		
2.12.8 Journey management	All small boat and watercraft operations should be carried out in accordance with a Journey Management system, which should define conditions under which operations are approved (the latest/forecasted sea state, currents, wind, permitted driving hours, visibility, etc.). Operating guidelines to be followed and precautions to be taken are described in the references.		S2 S5
2.12.9 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 and allow for any emergency that might occur from a small craft malfunction.		
2.12.10 Small boat operations: Land	Small boat and watercraft operations should comply with local river transport laws and regulations. Procedures should be in place for controlling land specific hazards, e.g.: • Traffic; • Predators; • Debris; • Low hanging tree limbs or vegetation; • Tides; • Shallow water; • Currents; • Blind corners; • Smaller craft being swamped.		S5
2.12.11 Small boat and watercraft operations: TZ	Operations are in compliance with guidelines, requirements and practices in the reference document		S2 S5
2.12.12 Small boat operations: Deep sea	FRCs and other rescue craft should only be used for in water repairs following risk assessment. Such use should not compromise the vessel certification. Any small boat operation requires the captain's authority as he is responsible for the maintennance of certification standards. Any small boat operation must have a recovery plan. Small craft are subject to any exclusion zones about platforms and work sites in the same manner as larger vessels and are subject to the same permissions and communications processes.		S6
2.12.13 Airboat operations	Operations are in compliance with guidelines, requirements and practices in the reference document as well as the following: * All seats to be fitted with seat belts * Safety shroud is fitted around the propeller; Procedures in place for controlling unique Hazards, (back wash from propeller, large wake, slow to come to a stop).		M3 S2 S5

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.13 Marine vessels, seismic and support			
2.13.1 SOLAS and MARPOL	For all vessels engaged irrespective of size, the best practices of SOLAS and MARPOL will be applied. Where guidance in this document differs the most stringent will be applied.		
2.13.2 Non mandatory vessels	Non-mandatory vessels under the tonnage requirements for international, national and safety conventions should still be managed under such standards. Control of such vessels and craft shall be contractually agreed.		IMCA Class requirement
2.13.3 Vessel design and certification	All vessels should be built and equipped to the requirements of a recognised 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.		Class Requirements S7 S12
2.13.4 Small & special purpose craft design & certification	Such craft should be designed and constructed according to good practice under the control and acceptance of recognised and accepted technical authorities.		
2.13.5 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. The client/contractor/subcontractor should contractually agree manning levels pertinent to the requirements of the project flag state requirements		S7 S14
2.13.6 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.		
2.13.7 Emergency equipment/life saving appliances – general	The vessel(s) should be appropriately equipped for its class with life saving appliances complying with, and in accordance with the references. All emergency equipment onboard should be maintained in a state of readiness at all times, including regular testing. The relevant personnel onboard should be trained in its use.		Class requirement SOLAS S7 S14
2.13.8 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 onboard. 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.		S7
2.13.9 Survival craft	In cold-water areas, rigid hulled life boat(s) i.e. the Totally Enclosed Motor Propelled Survival Craft (TEMPSC) are preferred.		S7
2.13.10 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.		S7

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.13.11 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.		S7
2.13.12 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.		
2.13.13 Rescue boat	A rescue boat with competent crew should be readily available for immediate launching whilst operations are taking place: • Water jet propulsion is preferred; • Rigid hull preferred; • Diesel powered.		S7
2.13.14 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 and safe attachment points. Integrated PFD and harness may be considered if robust regime of inspection and maintenance is in place. Harnesses consisting of a single waist belt shall not be used. See further comment under safety critical job section of this document.		S6
2.13.15 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)		
2.13.16 Transfer of personnel at sea	The need and circumstances for transfer of personnel at sea shall 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 shall also be obtained. Such transfers should comply with locally enforced regulations.		S6
2.13.17 Basket transfers	Basket transfers are not recommended and should only be conducted if contractually agreed 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.		S6
2.13.18 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/ROVs		S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.13.19 Storage of chemicals, oxidants & acids	Procedures are 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 MSDS to be available at the storage location, work location if appropriate, and at a location accessible to all crew; • Stored according to MSDS; • 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.		M1 M3 S5 S6
2.13.20 Support vessel mobilisation	Documented procedures should be in place for mobilising non-standard heavy equipment, streamer reels, AUVs etc. Bunkering at sea should be subject to formal risk assessment and documented procedures. Support vessels need to be provided with full set of relevant project documentation and procedures, and receive project induction briefing from contractor management.		
2.13.21 Close pass operations or when otherwise entering exclusion zones	Project HSE plan or interface document will include a risk assessment and identify procedures for entering the exclusion zone. A SIMOPS document will be developed which may include, but not be limited to, the following: • PTW protocol – vessel may work under PTW system of third party • Closest approach permitted given specific metocean conditions • Pre-entry checks required • Ship's bridge & engine room manning criteria • Operational readiness status of auxillary equipment required • Diving, sub-sea ROV, working overboard operations • Pre-entry radio checks and final permission • Ban on emergency tests and radio silence controls		S6 S19 S23 S25
2.13.22 Multi vessel Operations: OBC, WAZ, etc.	In multi vessel operations a single control point for overall vessel movement should be established. A dedicated communications coordinator may be required.		S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.14 Air transport			
2.14.1 Air operations – procedures	Air operation(s) should be in compliance with the relevant guidelines, requirements and practices in the reference documents.		S1 S8 S13
2.14.2 Audit of air operations	A competent aviation expert should conduct an independent audit at the start of operations (by client or contractor).		
2.14.3 Helicopter decks	Requirement for and availability of helicopter landing decks should be contractually agreed. • The helideck crew, HLO, helideck assistants, and fire fighters, are suitably Trained and experienced, this shall include fire fighting training. • The entire helideck crew will have exercised together before the first helicopter operation. This will include proof that the fire fighting equipment has been tested and is fully serviceable. • The helideck fire fighting system shall be fit for purpose and have sufficient coverage of fire fighting systems and equipment. • The helideck shall be certified for the largest size and weight of aircraft expected to be used. • The helideck friction will meet the environment and equipment to be used. Should this include a net it must 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 will 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 shall have procedures for helicopter operations; these procedures shall include all elements list above and detailed passenger handling instructions, and formal passenger safety briefing procedures. • Weather and deck heave monitoring available.		S13
2.15 Camps and field workshops			
2.15.1 Electrical	A competent person must be identified as responsible for all electrical aspects on the crew. The client/contractor/subcontractor should mutually agree on applicable standards. Compliance with guidelines, requirements and practices in the reference document.		S5 S6 IEE guidance
2.15.2 Camp sites and site selection	Camp sites should be located with suitable regard to safe access, environmental impact, community impact, and general safety and security. As far as possible, the camp site should be left in the same condition as it was found. Contractor to prepare camp remediation plan prior to demobilisation.		S5 E6
2.15.3 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		M10

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.15.4 Ladders and scaffolds	Compliance with guidelines, requirements and practices in the reference document: • Designed to support load • Buddy system • Non-conducting ladder for electrical work • Safety feet and rubber tips for extension and straight ladders • Step ladders not to be used as straight ladders • PPE • Tool belts or pouches.		S5 S6
2.15.5 Welding, burning, cutting – general safe practices	Compliance with guidelines, requirements and practices in the reference document.		S5 S6
2.15.6 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.		S5 S6
2.15.7 Storage of chemicals, oxidants, acids	Procedures to be in place which include the following controls: • Appropriate hazardous communication training programme • An inventory of all hazardous materials is maintained by the crew: relevant MSDS to be available at the storage location, work location if appropriate, and at a location accessible to all crew; • Stored according to MSDS; • 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; • Assessed for compatibility with other stored chemicals; • Adequate ventilation; • Appropriate fire extinguisher media Training including practical experience should be provided for specific recovery equipment, e.g. operation and use of Class D fire extinguishers for use on metal fires such as lithium.		M1 M3 S5 S6
2.15.8 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; • Training requirements.		S5 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.15.9 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 an adequate distance from water sources (e.g. ponds, rivers creeks) to avoid possibility of environmental pollution; • Designated area(s); • Spill prevention plan; • Separation of hazardous areas; • Containment system(s); • High visibility warning signs; • Appropriate fire fighting equipment positioned within 15m of pumps or dispensers • Only approved fuel tankers to be used; • Tankers adequately grounded during fuel transfers; • Appropriate PPE; • Designated and trained fueler. 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.		S5 S6 E6
2.15.10 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.		S5 S6 E6
2.15.11 Compressed gases	Procedures should be place for compressed gases, including: • Segregation; • Safe distances; • Hydrostatic testing; • Labelling; • Storage; • Handing.		S6 S5
2.15.12 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.		
2.15.13 Emergency systems for fires onshore	A system to detect and protect from fires onshore should be inline 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 PPE. • Fire/smoke detection devices should be installed in the accommodation, and adjacent areas.		S5

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.16 Security (land and marine)			
2.16.1 Assessment	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.		SEC4 SEC6 ISPS code
2.16.2 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. In marine operations client/contractor/subcontractor should agree on security arrangements if vessels do not fall under ISPS requirements and or non-ISPS certified ports are contemplated.		SEC2 SEC3 SEC4 SEC5 ISPS code
2.16.3 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.		SEC1 SEC2 SEC3 SEC4 SEC5
2.16.4 Potentially aggressive interference or intervention by third parties to the project	Identify, assess and document the risks that exist from third party activities. Document the procedures that are to be followed in the event of interference/intervention by a third party, including interface issues between client/contractor/subcontractor events to be addressed 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.		SEC1 SEC2 SEC3 SEC5 SEC6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.17 Survey and line operations			
2.17.1 Surveying	Compliance with guidelines, requirements and practices in the reference document: • Brush cutting • Tree felling and chain saw operations; (client/contractor/ subcontractor should mutually agree on the necessity of these activities and perform a risk assessment) • Bridging; • Surveyors should identify hazardous areas and indicate on line maps: • Line marking should utilise biodegradable or recyclable materials where possible. If working on steep slopes, a comprehensive set of procedures should be developed , which should include: • The use of specialists (mountaineers) for very steep terrain; • Training of personnel on techniques for working on slopes; • Go/no-go instructions; • Medevac preparations adapted to terrain, e.g. helicopters with winches for evacuation and specific training for personnel; • PPE for working on slopes including boots with ankle support and proper non-slip soles.		S5
2.17.2 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 Heliportable operations.		S5
2.17.3 UXO clearance	A comprehensive set of UXO clearance procedures should be developed based on client's specialised assessment of the area. These should include but not limited to: • Compliance with relevant local military and civil regulations; • Qualified specialists will be contracted to locate and destroy UXO • Provide visible marking of hazardous zone • Strict enforcement of procedures on access to danger areas; • Go/no-go instructions; • Daily report on UXO clearance and accessible areas; • Training and meetings on the danger of UXO and identification of restricted areas; • Provision and use of specialist UXO clearance PPE.		IMAS

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.18 Shot hole drilling			
2.18.1 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.		S5
2.18.2 Safety equipment for drill/ ramming units	Compliance with manufacturers' recommendations and guidelines, requirements and practices in the reference document.		S5
2.18.3 Maintenance	Compliance with manufacturers' recommendations and guidelines, requirements and practices in the reference document.		S5
2.18.4 Operators competence and selection	Perform an assessment inline with reference document of drilling operator experience, skill, training and understanding on the specific unit(s) used.		M3 S5
2.18.5 Heliportable drilling loadmasters	Heliportable drilling operators should be trained as helicopter loadmasters.		M3 S1 S5 S8
2.18.6 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; • Heliportable drills.		S1 S5 E6
2.18.7 Clean up; Move up	Flowing hole/Artesian well management plan. Compliance with guidelines, requirements and practices in the reference document.		S5 E6
2.19 Explosives			
2.19.1 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.		S5
2.19.2 Supervision	Supervisors responsible for operations where explosives are used should meet the competencies defined in the reference.		M3 S5
2.19.3 Personnel	All personnel handing explosives should be qualified, certified as competent to perform the allotted explosives handling jobs.		M3 S5
2.19.4 Offsets	Shot point 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).		S5 E9 E10
2.19.5 Proximity of radio emissions	The measures including safety distances for the prevention of unplanned detonation of electric detonators by radio frequency radiation should meet the recommendations in the reference.		S5 S22 E9 E10
2.19.6 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. • In shot holes of less than 3 meters, self-destructing products are recommended.		S5 E6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.19.7 Transportation – land, water, air	Procedures should be in place for explosives transportation (land, water and air), as per reference documents.		S1 S5 S8 S15
2.19.8 Storage distances	The distances of explosives storage facilities from other structures, buildings and infrastructure and should meet the recommendations as stated in the reference.		S5 E9 E10
2.19.9 Storage	Storage of explosives should comply with local regulations.		S5
2.19.10 Storage management	Only competent personnel should be made responsible for the control of explosive inventories. Physical inventory of explosives shall be checked against the records of the inventory at regular intervals.		M3 S5
2.19.11 Storage – locations (see 2.19.8 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.		S5 E9 E10
2.19.12 Magazines	Explosives magazines should comply with the following: • Be of sound construction; • 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.		S5 S21
2.19.13 Temporary field storage	Temporary storage facilities for explosives in the field should have: • Adequate security (including secured for unauthorised removal); • Adequate weather protection; • Adequate ventilation; • Up to date inventory.		S5 E9 E10
2.19.14 Separation from other materials	Explosives to be stored in isolation from other materials. Detonators always stored away from explosives.		S5 E9
2.19.15 Housekeeping	Area to be kept clean. Empty explosive packaging to be removed from site. Preference is for burning of packaging in a safe manner. Packaging should not be put to other use or handled inappropriately due to the potential contamination of human skin by contact with chemical residue.		S5
2.19.16 Shot hole loading	Compliance with guidelines, requirements and practices in the reference document. Multiple charges 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.		S5
2.19.17 Shot firing	Compliance with guidelines, requirements and practices in the reference document. Delayed blow-outs procedures providing minimum approach times after shot being fired. This will never be less than one minute. Multiple firing lines are not permitted. A Blaster should only use a single firing line.		S5
2.19.18 Disposal	Procedures should be in place for disposal of explosives in coordination with the manufacturer and/or supplier.		

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.19.19 Abandoning misfires	Procedures for handling abandoned charges must 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 must be cut and placed in the drill hole as deep as possible beneath the surface; • The surface must be covered with drill cuttings; • The Contractor must keep a permanent record of the misfire, including information on the location, explosive type, size and depth; • If required, reports must be submitted to appropriate regulatory agencies; The following practices are not recommended: • Sympathetic detonation (re-entry or drilling near-by); • Attempts to retrieve the misfired charge (assess erosion and area activities); Surface identification/monumenting of abandoned charges to prevent unlawful recovery (subject to local regulations).		S5 E6
2.20 Vibroseis			
2.20.1 Training	Operator and mechanic Training to be conducted.		M3
2.20.2 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.		M3 S5
2.20.3 Maintenance	Maintenance schedules should be defined. Manufacturers' recommendations should be followed.		S5 Manufacturer manuals
2.20.4 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.		E6 E9 E10
2.20.5 Night operations	Compliance with guidelines, requirements and practices in the reference document.		S5
2.20.6 Hydraulic fluid leaks	Procedures should be in place to minimise impact in case of hydraulic spills.		S5 E6
2.21 High pressure air sources			
2.21.1 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; • 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.		Class if relevant M3 S5 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.21.2 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 minimise manual handling/ergonomics; • Design of array to minimise 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.		S6
2.21.3 Air gun operation 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/ignals when air guns on deck; • Ergonomics - manual handling of air guns/heavy parts is minimised; • Safe system of work if test firing; • Minimisation of pressured air guns on deck – bled down before recovery to deck; • Medical emergency procedures in place in case of HP air injury; • LOTO during maintenance; • Awareness of explosion Risk of oil in HP air lines/non-greasing philosophy.		M3 S6
2.21.4 Soft start	Source arrays will be operated according to industry approved best practice or local legislation, whichever the more stringent.		E8
2.22 High voltage electricity (including EM & ROV)			
2.22.1 High voltage Electricity – EM, ROV operations	Certification of the system to a recognised 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; • Ergonomics – manual handling of EM fish/source is minimised.		S6
2.23 Other energy sources			
2.23.1 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. A MoC procedure may be necessary.		

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.24 Land recording operations			
2.24.1 Safety equipment	All recommended PPE to be worn according to 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).		M2 S5
2.24.2 Communications camp to field	Compliance with guidelines, requirements and practices in the reference documents.		M2 S5
2.24.3 Cable pick up/lay out by hand or vehicle	Compliance with guidelines, requirements and practices in the reference document.		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.		
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.		E6 S5
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.		S5
2.24.7 Land operations in darkness	There should be contractual agreement permitting night time operations. Procedures for operations in hours of darkness on land should include: • An ongoing risk assessment to determine what operations can be safely conducted in the prevailing conditions (terrain, environment, transport, energy source, 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. Unforeseen requirement for working at night time should be subject to a management of change process.		S5

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.25 Water and river operations			
2.25.1 Fatalities	Hazard analysis and risk assessment of drowning for all operations. Currently drowning shares the biggest percentage for fatalities with road transportation. Most of those fatalities are related to land operations, not marine.		M10
2.25.2 Competence	All exposed personnel to be swim tested before being exposed to shallow water or river operations. Note: this is not applicable to marine operations covered by the requirement for offshore safety and survival training.		S5
2.25.3 Operations 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 unauthorised areas • Swift water rescue plans.		S5
2.25.4 Recovery (PPE)	All exposed staff to wear approved PFDs.		S5
2.25.5 Boat operations at night	Compliance with guidelines, requirements and practices in the reference document.		S5 S10
2.35.6 Ice operations	Compliance with guidelines, requirements and practices in the reference document.		S5 H2 E4
2.26 Back deck marine operations			
2.26.1 Working environment	Working areas (back deck) 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. 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.		S6 H2
2.26.2 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); • Specialised fire extinguishers in place e.g. Class D extinguishers for lithium compounds; and appropriate training provided in their application and use.		M3 S6
2.26.3 Edge protection 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.		S6
2.26.4 Manning	No person should work alone on the back deck		

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.26.5 Protection from dynamic loads and rotating/ moving equipment	The risk of injury from dynamic loads should be reduced by use of the following but not limited to: • Design of deck to minimise exposure; • Restricted access areas; • No unnecessary personnel on deck; • Clear access-ways with adequate width; • Guarding of rotating equipment; • Barriers to moving equipment; • Correct use of wires/ropes.		M3 S6
2.26.6 Protection from loose clothing, long hair, jewellery	Procedure to be documented to protect personnel from Hazards that could get caught up in machinery		
2.26.7 Protection from electrocution	All power to be removed from streamer when disconnecting or connecting sections		S6
2.26.8 Emergency response – equipment, communications	Strong emphasis on protection against a person falling overboard including, but not limited to: • Safe working practices; • Barriers; • Life lines; • Wearing of automatic inflating Life-jackets with reflective material and water activated lights; • Personal locator beacons where suitable; In case of a man over board • Marker buoys, light rings and other such devices that can be thrown overboard to aid person in water and mark their location; • 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.		S6
2.26.9 Portable equipment/hand tools	Use of battery operated or low voltage tools with transformer isolated supply preferred. Circuits used for other electrically powered tools to have RCCB protection. 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.		M3 S6
2.26.10 Certification/testing of load bearing equipment	Winches, booms, cranes, wires, chains, cables, tie down points, pad-eyes and devices subject to proof load test and maintained under survey.		
2.26.11 Defined procedures for safety 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.		S6
2.26.12 Housekeeping – good seamanship	Minimisation of slip/trip hazards. Proper stowage of equipment. Equipment tied down in adverse weather.		S6
2.26.13 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.		M3 S6 E7
2.26.14 Handling/storage of batteries	All batteries to be stored correctly in designated areas. Procedures established for handling lithium batteries. Personnel trained in handling batteries.		M3 S6

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.27 Cranes/lifting devices			
2.27.1 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; • Preventive maintenance system in place; • Structural condition of foundations/lifting points; • 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.		S20
2.27.2 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.		S20
2.27.3 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.		S20
2.27.4 Operations – procedures	The operation of all cranes and lifting equipment should be carried out with: • PTW – LOTO procedure in place during maintenance; • Inspection routines in place; • Trained and competent operators; • Assigned operators/banksmen; • Standardised signals; • Suitable communication means; • 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; • Rigging of the load is carried out by a competent person; • Load does not exceed dynamic and/or static capacities of the lifting equipment; • A competent person(s) has visually examined all lifting equipment before each lift.		M3 S20

	Minimum expectation required to control the hazard(s)/risk(s)	Remark, alternative or exception	Reference
2.28 In-water repairs and maintenance			
2.28.1 General operations	Operational planning and execution should be carried out in accordance with reference and related guidance in this document.		S6
2.28.2 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 contractors training programme.		M3 S6
2.28.3 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.		
2.28.4 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 airguns etc.		S6 S19 S23 S25
2.28.5 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; • Affects of sun/salt/heat/cold on boat crew.		S6
2.28.6 In-water repair procedures	Workboat operations should be permitted only where procedures have been specified and validated in exercises.		S6
2.28.7 MOPO for workboat operations identifying prohibited jobs	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.		S2 S6
2.28.8 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.		M1
2.28.9 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).		M3 S2 S6

What is OGP?

The International Association of Oil & Gas Producers encompasses the world's leading private and state-owned oil & gas companies, their national and regional associations, and major upstream contractors and suppliers.

Vision

- To work on behalf of all the world's upstream companies to promote responsible and profitable operations.

Mission

- To represent the interests of the upstream industry to international regulatory and legislative bodies.
- To achieve continuous improvement in safety, health and environmental performance and in the engineering and operation of upstream ventures.
- To promote awareness of Corporate Social Responsibility issues within the industry and among stakeholders.

Objectives

- To improve understanding of the upstream oil and gas industry, its achievements and challenges and its views on pertinent issues.
- To encourage international regulators and other parties to take account of the industry's views in developing proposals that are effective and workable.
- To become a more visible, accessible and effective source of information about the global industry, both externally and within member organisations.
- To develop and disseminate best practices in safety, health and environmental performance and the engineering and operation of upstream ventures.
- To improve the collection, analysis and dissemination of safety, health and environmental performance data.
- To provide a forum for sharing experience and debating emerging issues.
- To enhance the industry's ability to influence by increasing the size and diversity of the membership.
- To liaise with other industry associations to ensure consistent and effective approaches to common issues.

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