



# HSE aspects in a contracting environment for geophysical operations

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## Schedules and plans

Report No. 6.92/317  
May 2001



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# HSE aspects in a contracting environment for geophysical operations (schedules and plans)

Report No: 6.92/317

March 2001

The OGP Seismic Safety Subcommittee (SSSC) through their HSE Schedule and HSE Plan Work Groups has prepared this guideline for the OGP/ IAGC.

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# 1 Introduction

## 1.1 General/background

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This document has been prepared to assist both client and contractor companies to achieve continuous HSE performance improvement during the planning and execution of geophysical operations (land, marine, shallow water and transition zone). This is achieved through a structured implementation of a project specific HSE MS, including HSE risk reduction measures.

The guidelines in this document are consistent with and supplementary to the OGP *Guidelines for the development and application of health, safety and environmental management systems* (report No. 6.36/210, July 1994) (OGP M1) and have been aligned with the contracting process defined in the OGP “HSE Management - Guidelines for working together in a contracting environment”(Report No. 6.64/291 October 1999) (OGP M2).

This publication supersedes the following three OGP publications:

1. *Guidelines for Documenting and Implementing Field HSE Management Systems for Geophysical Operations*, report no. 6.71/280 September 1998;
2. *HSE Schedules for Land Operations*, report no. 6.35/207 July 1995;
3. *HSE Schedules for Marine Geophysical Operations*, report no. 6.34/206 July 1994.

The contents of report 6.71/280 have been incorporated, while the 1994/95 HSE schedules have been revised.

### *HSE Schedules*

The schedules set out minimum Health, Safety and Environmental (HSE) expectations/requirements for geophysical operations (land, marine, shallow water and transition zone). The Schedules refer to OGP, IAGC and other Industry guidance documentation and can be used as a route map to the more detailed requirements they contain. Where these guidelines do not adequately address an issue, the Schedules include a more detailed description of the requirements to be met. It is anticipated that these more detailed descriptions will be included in future reviews of those guidelines.

The Schedules can either be included in their entirety as part of a contract or as minimum model schedules to which supplementary but not overlapping requirements can be added.

### *Crew HSE Plan*

Documented Contractor and joint Contractor/ Company HSE Management Systems have been in place in selected locations since 1992 but there has been considerable variation in content and terminology used. These guidelines are intended to represent geophysical industry ‘best practice’ and suggest a content and standard terminology that could be applied to any geophysical operation.

The HSE Plan guidelines have been prepared to assist Contractor and Crew management in the documenting and implementing of a system to manage HSE in Geophysical Field Operations, which meets both the expectations of their own company and those of their clients and subcontractors.

Such a system will ideally consist of three parts: the Contractor HSE Management System (HSE-MS), the Company HSE-MS and a description of the interface of these two systems at project level. The HSE Plan guidelines will focus primarily on the Contractor HSE-MS (at crew level) and the description of the interface.

In these guidelines, the documentation of the Contractor HSE-MS at crew level will be referred to as the *Crew HSE Plan*. This is equivalent to the “HSE Plan” as mentioned in reference OGP M2.

### *Project HSE Plan*

The documentation of project specific HSE issues, including the interface between the Crew and Company HSE-MS’s, will be referred to as the “Project HSE Plan”. The Project HSE Plan should include project specific issues and focus on key gaps and areas of differences in the interface between the Company and crew HSE-MS and how these will be addressed. The Project Plan can either be a standalone document or be incorporated in the Crew HSE Plan.

## 1.2 Purpose and scope

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The Schedules and HSE Plan guidelines provide a set of the HSE expectations / requirements and describe a MS, which if effectively implemented, will deliver a consistent and rigorous control over the HSE hazards and risks inherent in geophysical operations, thereby leading to continuous improvement in the HSE performance of the crew.

The Schedules and HSE Plan guidelines:

- contain a set of minimum HSE expectations/requirements for geophysical operations (land, marine, shallow water and transition zone), for use in contracts;
- describe a process for effectively implementing the Contractor's corporate level HSE-MS on a specific geophysical operation, which also meets the Company's HSE expectations/requirements set out in a contract;
- provide a framework for managing Health, Safety and Environment on geophysical field operations;
- are sufficiently generic to be of world-wide use to the geophysical industry;
- are useful as a learning document for those unfamiliar with the HSE Management System methodology and for the key HSE risk areas in geophysical operations.

## 1.3 The health, safety and environment management system model

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In line with the OGP "Guidelines for the Development and Application of Health, Safety and Environmental Management Systems" (Report No. 6.36/210), the HSE-MS Model used in this guideline consists of the following elements:

- Leadership and Commitment
- Policy and Strategic Objectives
- Organisation, Resources and Documentation
- Evaluation and Risk Management
- Planning and Procedures
- Implementation and Monitoring
- Auditing and Reviewing

It is recognised that some organisations may have adopted a model that differs from this but the methodology of developing and implementing an HSE Management System at the project level as described in these guidelines may still apply.

## 1.4 The HSE management system for geophysical operations

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Successful HSE management on geophysical crews requires strong co-operation and alignment between Company and Contractor and necessarily requires effective interfacing of Company and Contractor HSE management systems. HSE management on geophysical operations is built upon a model that has three very clearly defined hierarchical levels (Fig. 1), with the contract forming the main interface document between the Corporate and Crew levels.

Where Subcontractors carry out part of the work, they should either:

- Have their own Corporate level HSE Management System and crew specific HSE Plan applicable for the work being undertaken as part of the geophysical operation (in which case an interface document between the Contractor and Subcontractor systems should be written), or
- Be fully integrated into the HSE management system of the geophysical Contractor. From a HSE perspective, all subcontracted staff will thus be managed as though they were employees of the geophysical Contractor (in which case responsibilities should be communicated to Subcontractors).

These guidelines have been produced to enable organisations to implement a system for effectively managing HSE at the crew level. They refer specifically to that part of the model described as HSE aspects in a contracting environment for Geophysical Operations in Figure 1. Guidance on how to use the HSE Schedules and on the content and preparation of the Crew HSE Plan and the Project HSE Plan is provided.

It is important to keep HSE Plans short and concise and to avoid unnecessary duplication. In certain circumstances (e.g. crews formed for one contract/project), it may be desirable to combine the Crew and Project HSE Plans into a single document.

## 1.5 Structure of the guideline

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The HSE Schedules, the Crew HSE Plan and Project HSE Plan are described in the following chapters:

### *HSE Schedules:*

Chapter 2 and Attachment 1

### *Crew HSE Plan:*

Chapter 3

### *Project HSE Plan:*

Chapter 4 and Appendix 1

Each chapter has the same structure:

- 1 Objectives
- 2 Contents and Format
- 3 Implementation

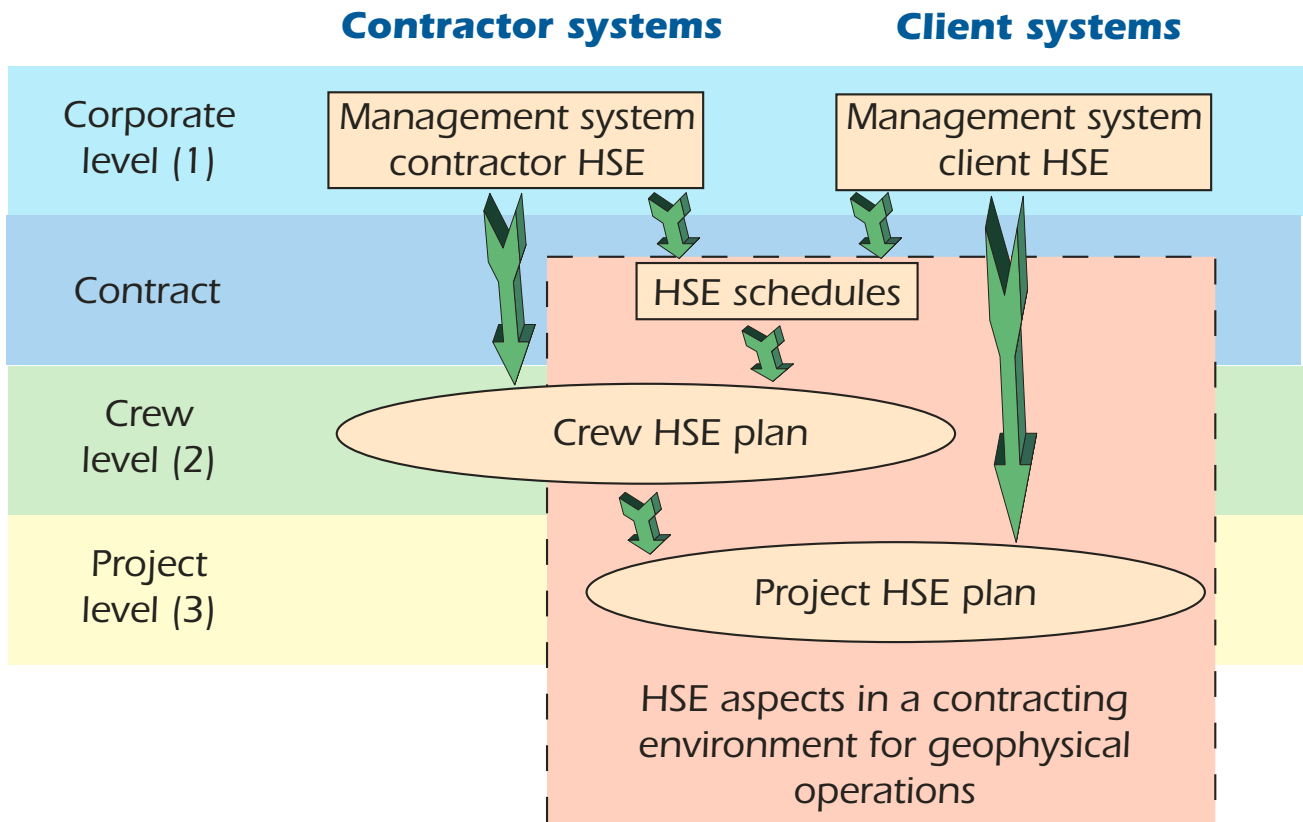
For ease of reference, two important subjects have been included in the guideline as appendices:

*Allocation of Responsibilities* (Appendix 2)

*The Risk Assessment Matrix* (Appendix 3)



Figure 1: HSE management systems for geophysical operations



### *Corporate Level (1)*

The Company's and the Contractor's Corporate HSE Management Systems. The Contractor's HSE-MS is a high level description of the systems and processes in place to manage HSE across the organisation that requires translating into day to day HSE management at crew level. The Company's HSE-MS is a set of expectations that set out boundaries within which geophysical operations shall be conducted.

### *(Contract)*

This will be, in many cases, the main interface document between Company and Contractor and should clearly define the joint HSE expectations and requirements.

### *Crew Level (2)*

The Crew HSE Plan is the implementation of the Contractor's Corporate HSE management system on a geophysical crew, providing the Contractor's Corporate HSE management system meets the expectations of the Schedules. It may be specific to the geophysical crew and can be independent of Company and individual project. The development of the Crew HSE Plan is the responsibility of the Contractor.

### *Project Level (3)*

The Project HSE Plan supplements the Crew HSE Plan and is a tool for managing those HSE matters that are related to a specific project and Contractor/Company relationship and that are not addressed in the Crew HSE Plan. The document includes descriptions of joint roles and responsibilities, communications between all parties upon which the work may have an impact, including third parties (such as producing fields, rescue organisations, local populations, etc.), emergency procedures, work programme etc. The document will generally require input from both Company and Contractor, who should agree on which party is to be responsible to collate information and to produce and distribute the final document.

## I.6 Evaluation and risk management

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Evaluation and Risk Management or Hazard Management is the core of a HSE-MS. This important subject is therefore treated in various parts of this guideline. An overview of the various sections in which Hazard Management is discussed and the relationship of these various sections is given below.

### *Chapter 3.2 Section 4*

outlines the suggested contents of the Hazard Register that should be the result of the Hazard Management system described above.

### *Chapter 3.3.1.3*

describes how to implement a Hazard Management system on the crew.

### *Chapter 4.3.1.3*

describes how to handle project specific hazards, i.e. those that are not covered in the Crew Hazard Management system.

### *Appendix 2*

describes how the controls and tasks that are contained on the Hazard Sheets are translated into specific individual tasks via individual Job Descriptions.

### *Attachment 1 Table 1.4*

Risk management states the expectations on the assessment of risks.

### *Attachment 1 Table 2*

includes the most significant HSE risk areas in geophysical operations. For each aspect (threat or control type) for particular risk areas, the expectations for the controls are given; this is achieved by pointing to a section(s) / chapter(s) in industry reference document(s) supplemented in some cases by additional requirements. When there is either no suitable industry references or they are considered to be inadequate for the effective control of the risk aspect, a more detailed description of the controls is given.

## I.7 Terminology

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Various terminology is used for the different parts of the proposed documentation and its contents. Reference is made to the IAGC/OGP report *Glossary of HSE Terms* (No. 6.52/224 September 1996) and the Glossary in this document.

## 2 HSE schedules for geophysical contracts

### 2.1 Objectives

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The objectives of the HSE Schedules are:

- to set out the minimum Health, Safety and Environmental (HSE) expectations and/or requirements for Geophysical Operations (land, marine, shallow water and transition zone);
- to support the contracting phases during contractor pre qualification and selection processes as described in the OGP HSE Management Guidelines for working together in a contracting environment Report No. 6.64/291 October 1999;
- to be directly used in geophysical operation contracts;
- formatted to allow the Schedules to be used throughout the planning and execution of a project to check for compliance, (e.g. during Company/ Contractor/Subcontractor meetings and HSE audits and reviews);
- guidelines of good industry practice for HSE management in geophysical operations;
- to be a route map to the industry references on HSE aspects, which are relevant to geophysical operations.

### 2.2 Contents and format

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The layout of the tables in Attachment 1 is depicted in the figure overleaf.

#### *Attachment 1 Table 1*

contains the expectations for each of the 7 HSE MS elements of the HSE MS model described in the “Guidelines for the Development and Application of Health, Safety and Environmental Management Systems” (Report No. 6.36/210, July 1994). The index in Attachment 1 lists the sub elements under each of the seven main elements.

#### *Attachment 1 Table 2*

contains the expectations for the key controls for the major risk areas in geophysical operations.

#### *Attachment 1 Table 3*

A list of the references used in the Schedules.

# Organisation of the schedules

Leadership & commitment

HSE policy statement

Organisation, resources & documentation

Evaluation & risk management

Planning & procedures

Implementation & monitoring

Audit & review

## High risk areas

- occupational health & medical care
- environment & waste management
- land transport
- water transport (small boats)
- marine seismic and support vessels
- air transport
- camps & workshop (electrical, camp sites, welding, batteries, fuel, HP systems, gases)
- security (land and marine)
- third party activities
- natural hazards (weather, terrain, fauna/flora)
- drilling
- explosives
- vibroseis
- airgun
- survey and line operations (surveying, mine clearance, water operations, ice operations)
- land recording operations
- cranes, winches and lifting devices
- backdeck marine operations
- in-sea repair & maintenance

## R e f e r e n c e

## HSE management

- OGP M1** Guidelines for the development and application of health, safety and environmental management systems, 1994, Ref. 6.36/210
- OGP M2** HSE management: guidelines for working together in a contract environment, 1999, Ref. 6.64/291  
*HSE aspects in a contracting environment for geophysical operations (schedules & plans)*
- OGP M3** HSE competence assessment and training guidelines for the geophysical industry, 1999, Ref. 6.78/292
- OGP M4** Guidelines for HSE auditing in the geophysical industry, 1996, Ref. 6.53/245

### Health

- OGP H1** Health management guidelines for remote land-based geophysical operations, 1993, Ref. 6.30/190
- OGP H2** Substance abuse: guidelines for management, 2000, Ref. 6.87/306
- OGP H3** Standards for local medical support, 1995, Ref. 6.44/222
- OGP H4** Health assessment of fitness to work in the E&P industry, 1995, Ref. 6.46/228
- OGP H5** Guidelines for the control of blood borne pathogens, 1996, Ref. 6.55/251
- OGP H6** Health aspects of work in extreme climates within the E&P industry - the cold, 1998, Ref. 6.70/279
- OGP H7** Health aspects of work in extreme climates within the E&P industry - the heat, 1998, Ref. 6.65/270

### Safety

- OGP S1** Aircraft management guide, 1998, Ref. 6.51/239
- IAGC/OGP S2** Guidelines on the use of work boats in marine geophysical operations, 2000
- OGP S3** Land transport safety guidelines, 1996, Ref. 6.50/238
- OGP S4** Guidelines on permit to work systems, 1993, Ref. 6.29/189
- IAGC S5** Land geophysical operations safety manual, 1997, IAGC
- IAGC S6** Marine geophysical operations safety manual, 1997, IAGC
- SOLAS S7** International convention for safety of life at sea, 1992

### Environment

- OGP E1** Environmental management in oil & gas E&P, 1997 Ref. 2.72/254
- OGP E2** Oil & gas E&P operations in mangrove areas - guidelines for environmental protection, 1993, Ref. 2.54/184
- OGP E3** Oil industry operating guideline for tropical rainforests, 1993, Ref. 2.49/170
- OGP E4** Oil & gas E&P in arctic & subarctic onshore regions - guidelines for environmental protection, 1993, Ref. 2.55/185
- OGP E5** E&P waste management guidelines, 1993, Ref. 2.58/196
- IAGC E6** Environmental guidelines for worldwide geophysical operations, IAGC, 1994/2000
- MARPOL E7** Regulations for the prevention of pollution at sea

### *The format of the tables 1 and 2:*

| <b>Column 1</b>  | <b>Column 2</b>   | <b>Column 3</b>                  | <b>Column 4</b>              |
|--|---|----------------------------------|------------------------------|
| HSE MS elements and sub elements or Risk categories and aspects of control | Minimum expectation for the implementation of an HSE MS or to control the hazard(s) / risk(s) | Remark, alternative or exception | Reference(s) to requirements |

#### *Column 1:*

Table 1: contains the main HSE MS element with sub elements, to which the expectations in column 2 relate.

Table 2: contains the significant Hazard / Risk categories (e.g. Occupational Health, Drilling) with specific risk areas (e.g. noise, disposal of explosives, high pressure air systems) or aspects of control (e.g. Emergency Equipment, Maintenance, Driver Competence).

#### *Column 2:*

The expectations of control(s) to be in place. Where the reference(s) fully describes the expectation, then a statement to the effect 'comply with reference' will be used. This may also be supplemented with additional expectations for the control aspect. Where the existing guidelines do not adequately address an issue, the Schedules include a more detailed description of the requirements to be met.

#### *Column 3:*

To allow the Company and/or Contractor to add remarks, offer alternatives or to make exceptions.

#### *Column 4:*

References containing the details on what is expected to be in place. The references are specific down to section level within each reference. With the electronic versions (Web /CDROM) the user should be able to double click the reference to display the relevant details of the expectation. Where there are no references, the expectations should be fully covered by details in column 2.

## 2.3 Implementation

The HSE Schedules can be used within the overall contracting process as described in the OGP *HSE management - guidelines for working together in a contracting environment* (report no. 6.64/291 October 1999). The contracting process is given below, highlighting the roles of the HSE Schedules within that process.

| Contracting Process                           | Contractor   | Client Company   |
|---|--|--|
| Planning                                      | Benchmark and upgrade if required own internal HSE expectations and requirements against those in the HSE Schedules. | Define contracting strategy and evaluate HSE risks associated with the planned work against the expectations and requirements    |
| Pre-qualification                             | Contractors can state and or demonstrate that they meet the expectations and requirements of the HSE Schedules       | Shortlist and screen contractors. The schedules can be used to evaluate HSE information provided by the Contractor               |
| Selection                                     | Prepares the crew HSE plan (see Chapter 3) to meet the contract requirements (HSE Schedules)                         | Bid evaluation and contract award with objective evidence that the selected contractor can meet the HSE requirements of the work |
| Pre-mobilisation                              | Jointly establish the project HSE plan - see Chapter 4 Project HSE Plan  |  |
| Mobilisation and execution and demobilisation | Audit against the HSE schedules and additional agreed requirements.  |  |
| Close-out                                     | Joint review of performance, update expectations and requirements for future work                                    |  |
|   | Update expectations and requirements for future work   | Update expectations and requirements for future work   |

### *Including the Schedules in geophysical operations contracts:*

To maintain transparency during the tender /contracting process the original wording of the Schedules shall be maintained. Column 3 is provided to enable additional requirements, alternatives or qualifications to be made. No changes to the other columns should be made. Adherence to this usage guideline will facilitate the identification of the changes compared to the standard HSE Schedules, which have been made by either party during the tender (pre-qualification /selection phases).

### *Example:*

An example of the Articles of Agreement, which can be directly used in geophysical tenders/contracts is provided in Appendix 5. Attachment 1 contains the HSE Schedules.

| Column 1                               | Column 2  | Column 3   | Column 4                     |
|--|---|--|------------------------------|
| Risk categories and aspects of control | Minimum expectation to control the hazard(s)/risk(s)  | Remark, alternative or exception                                 | Reference(s) to requirements |
| 2.6.1 Air operations/ procedures       | The air operation(s) shall be in compliance with guidelines, requirements and practices in the reference document | Single engine aircraft shall not be used for personnel transport | OGP S1                       |

## 3 Crew HSE plan

### 3.1 Objectives

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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 and the assets/infrastructure, including that of third parties.
- to serve as a vehicle for the assessment of risk to the operation.

A key purpose is also the transfer of ‘ownership’ of the Contractor’s HSE-MS to the crew.

The Crew HSE Plan can be used to demonstrate that:

- the Contractor has an effective HSE MS which is being applied to the operation.
- all major hazards<sup>†</sup> and effects of, and to, the operation (People, Assets and the Environment) have been identified, assessed, and controlled and that recovery preparedness measures are in place (reference the Hazard Register, section 4 of the Crew HSE Plan).
- the execution and maintenance of all control and recovery measures are the responsibility of specific, named persons.
- the 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 hazards and effects assessments conducted by the Contractor.

The Plan should demonstrate that the Contractor is making efforts to continuously improve on the management of HSE.

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

Senior management commitment to the 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 Plan. However, an effective Plan should be prepared by those directly involved with the specific operation and should be owned by those responsible for it. The Plan should be fully endorsed by, and issued under, the signature of the most senior person who is directly accountable for the operation.

<sup>†</sup> The word ‘major’ used here is not meant to infer that other more minor risks are to be neglected, merely that the minimum requirement is to consider major events. Major hazards are those which occur in the shaded zone of the Risk Matrix (as given in Appendix 3) before the application of reduction measures. (Reduction measures should reduce the risk associated with a particular hazard to at least the lightly shaded before operations exposed to the hazard are allowed to take place)

## 3.2 Contents and format

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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.

A suggested list of contents for a Crew HSE Plan is as follows, containing 6 sections:

- 1) Introduction
- 2) Description of the facilities and operations
- 3) Description of the Operational HSE-MS
- 4) Hazard Register
- 5) Remedial Plan
- 6) Statement of Fitness

### *Section 1: Introduction*

This section should include:

- (i) An outline of the Crew HSE Plan
- (ii) Reference standards, Statutory Compliance and other documents
- (iii) Project Management description, organisation and resources
- (iv) Crew HSE Plan review cycle and responsibilities

### *Section 2: Description of facilities and operations*

This section should contain information or refer to other sources, which describe the crew/vessel, 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 major hazards and effects, discussed in Section 4, could impact the geophysical survey operations and its HSE management systems.

### *Section 3: Description of the Operational HSE Management System (for the particular Geophysical Operation (land, marine, shallow water or transition zone))*

The proposed structure of this section follows the headings of E&P Forum Guidelines for the Development and Application of Health, Safety and Environmental Management Systems, Report No. 6.36/210.

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

1. Leadership and Commitment
2. Policy and Strategic Objectives
3. Organisation, Resources and Documentation
4. Evaluation and Risk Management
5. Planning and Procedures
6. Implementation and Monitoring
7. Auditing and Reviewing

### *Section 4: Hazard Register*

This section should include a register of potentially significant hazards identified for the survey operation or site. It should demonstrate that all potentially significant hazards and effects have been identified, the risks from the hazards and effects evaluated and understood, and that controls to manage risks of the hazards and effects are in place. It should be based on the OGP classification (reference OGP Generic Hazard Register for Geophysical Operations, Report No. 6.40/217) or similar. Each potentially significant hazard identified should be described by a Hazard Sheet, which should cover the following items:

- (a) Hazard description
- (b) Possible consequences of hazard release (unmanaged or uncontrolled hazard):
  - What could happen?
  - What are possible end results?



- (c) 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.

A suggested means of assessing the risk is using a risk assessment matrix as given in Appendix 3.

- (d) Threats that could release the hazard.

Examples are poor weather (resulting in bad visibility, slippery roads), corrosion (resulting in leakage of fuel containers), etc.

- (e) Measures to control such threats (barriers). Barriers include physical guards, separation, procedures, etc.
- (f) Escalation factors that may increase the probability or consequences of hazard release. Examples are worn tires (aggravating the situation in case of poor weather), impact on fuel store (aggravating the situation in case of corrosion), etc.
- (g) Control measures for escalation factors.
- (h) Residual Risk Assessment based on the potential consequences of the hazard release and the probability of this potential consequence materialising, after all control measures are put in place.
- (i) Measures to recover from the release of a hazard.
- (j) Assessment of effectiveness/importance of threat control and recovery measures

Such an assessment would allow a judgement whether a (high) risk is adequately controlled. It would also allow control tasks to be ranked in order of priority and importance.

- (k) Cross reference of the controls and recovery measures to procedures, job descriptions and other documentation used to implement the HSE-MS in the survey operations, including PPE specifications.

### *Section 5: Remedial plan*

This section should include:

- (a) Action tracking and close-out: should describe the system used to track action items generated from hazard analysis, job safety analysis, audits, inspections, incident investigations and other sources.
- (b) Remedial plan; should list long lead or important actions which are required to achieve the intended level of hazard control.

### *Section 6: Statement of Fitness*

This section gives a statement of fitness with regard to the management system being in place, confirmation that the hazards have been recognised and the risks to People, Assets and the Environment as a result of those hazards has been suitably reduced to as low as is reasonably practicable.

A senior member of the Contractor's staff who holds line management responsibility (Party Chief or equivalent) will sign it.

## 3.3 Implementation

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### 3.3.1 *Development of a Crew HSE Plan*

#### 3.3.1.1 *General*

The Crew HSE Plan is the framework for the description of a HSE management system on the crew, whether it be an oil company (contract holder), principal Contractor or Subcontractor. Scope and complexity of the development process will depend on the size of the operation.

In a complex operation a number of Contractors/ Subcontractors may be involved and co-ordination and linking of their respective HSE Plans may be required. Specific responsibilities are addressed in Appendix 2.

The process of putting an HSE Plan together is as important as the product itself, in that the gaps and failings or shortcomings in a HSE-MS and its operational implementation can be identified.

The target audience of the Crew HSE Plan will be the crew's senior management. In practice, the best way to achieve dissemination to lower levels on the crew has been the development of 'subsets' of the Plan, containing at least relevant hazard sheets, job descriptions and procedures for the various departments.

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 follow.

Document control 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 crewmembers.

The Crew HSE Plan should fit in to an overall set of documents with which it is cross-referenced. By cross-referencing to other documents, the total volume of documents can be minimised.

#### 3.3.1.2 *The documentation process*

##### Gathering available documentation

The basis for generating the Crew HSE Plan is to assemble all documents that describe how HSE is managed, including regulatory and prescriptive documents that crews will need to comply with.

Example internal input documents are:

- HSE Manuals
- Procedures Manuals
- Job Descriptions

Example external input documents are:

- International regulatory requirements; SOLAS (for marine), etc.
- E&P Forum / IAGC guidelines
- National requirements / laws
- Industry guidelines

##### Implementation plan

The following outlines the basic steps to be taken in generating a Crew HSE Plan. More detailed descriptions of some of these processes are given later in this chapter.

##### *Define management system model:*

Identify what model the Contractor's corporate HSE-MS is based on. If none has been defined, use the OGP document "Guidelines for the development of an HSE-MS" (Report No. 6.36/210). These guidelines should be seen as minimum requirements against which to verify the HSE-MS model.

The management system must be auditable against accepted minimum requirements which must be established at the outset by providing clear, documented standards and reference points.

***System analysis and document audit:***

Conduct a Document Audit to determine the existing elements of the Corporate HSE Management System that will apply to the Crew HSE Plan.

***Broad gap analysis:***

Identify where the documentation is deficient; develop the missing systems elements and document areas that are poorly or not defined.

***Generate the hazard register:***

Based on identified hazards associated with an operation/ activity, identify the controls and recoveries necessary to control the major hazards. A register can be developed 'generically' (based on, for example, the OGP *Generic hazard register for geophysical operations*, report no. 6.40/217) and refined for a particular operation.

***Generate an improvement plan:***

Based on observed deficiencies in the identified controls / recoveries, document an improvement (or remedial action) plan defining the "what, when, who and hows".

***Audit and maintain system:***

Audit the system and implementation using the HSE-MS documentation. Review deficiencies and document in the improvement plan. Resolve deficiencies, update documentation and disseminate information to crew members.

***Suggested implementation activities and responsibilities***

| <b>Activity</b>  | <b>Suggested responsible parties</b>          |
|--|---|
| Level 1 - Define management system and objectives  |   |
| <ul style="list-style-type: none"> <li>▪ Review policies and management methods</li> </ul>   | Upper management                              |
| Level 2 - Review local operating procedures  |   |
| <ul style="list-style-type: none"> <li>▪ Review operating / local jhdhfgj sfhj procedures and how these are being implemented</li> <li>▪ Update documentation as appropriate</li> </ul>  | First line management                         |
| <ul style="list-style-type: none"> <li>▪ Define the Hazard Management System</li> <li>▪ Define main hazards and their controls / recoveries</li> <li>▪ Generate the Hazard Register</li> <li>▪ Identify links with other (sub) Contractors activities, controls, recoveries etc</li> </ul> | First line management/senior crew/ management |
| Level 3 - Refinement / change process  |   |
| <ul style="list-style-type: none"> <li>▪ Update HSE-MS with:               <ul style="list-style-type: none"> <li>▪ New policies, procedures, organisation</li> </ul> </li> </ul>  | First line management, upper management       |
| <ul style="list-style-type: none"> <li>▪ Use results from "Quantitative Performance Measures of HSE-MS Effectiveness" (OGP Report 6.61/260) to review and update the HSE-MS</li> </ul>   | First line management, upper management       |
| <ul style="list-style-type: none"> <li>▪ Use input from following to refine Hazard Management System: Job Safety Analysis, near misses, statistics, maintenance records/failure analysis of equipment, activity analysis, sub Contractors HSE-MS</li> </ul>                                | Crew, first line & upper management           |
| <ul style="list-style-type: none"> <li>▪ Update HSE Plan with:               <ul style="list-style-type: none"> <li>▪ Local feedback / logistics</li> <li>▪ Sub Contractor input / feedback</li> <li>▪ Feedback from Environmental Impact Assessments</li> </ul> </li> </ul>               | Crew, first line management                   |

### 3.3.1.3 *The Hazard Management system and Hazard Register generation.*

The core of this system is the Hazard Register which can be based on the OGP *Generic hazard register for geophysical operations* (6.40/217).

Based on internal standards and work methods, Companies should develop a set of controls and recovery measures for all the major hazards identified. From such a 'generic' Hazard Register, project specific Hazard Registers can then be made by for example deleting hazards that are not present or not major in that particular operation.

In the past, hazard registers have been developed covering a very large number of hazards, ranging from major hazards such as land transport to much less significant hazards. This has resulted in impracticably large HSE plans which, as a result, have become difficult to implement and maintain. It is recommended to focus on the major hazards (refer to Chapter 3.1). Other hazards will be adequately covered by proper implementation of the various elements of an HSE-MS such as competence, procedures, PPE, etc.. This process is shown in figure 2.

Each time the crew moves into a new mode or area the hazard register should be reviewed and specific changes in hazards / controls / recoveries identified and documented.

All individuals should be aware of the hazards and associated controls and recoveries relating to their part of operation (refer also to Appendix 2). A wide cross section of the crewmembers should be fully involved in the process of defining the hazard register for any operation and periodically review it.

An effective way to generate the hazard register is to work on it in small teams. Dissemination among the crew can lead to fresh ideas on the control of hazards.

Each crew should be supplied with basic information to assist them in starting up the project.

The inputs to establishing hazard control and recovery sections are:

- Generic set of standards/controls (if available)
- Risk assessments (frequencies / consequences)
- Job safety analysis
- Legal requirements
- Contractual requirements
- International regulatory requirements
- E&P Forum / IAGC guidelines
- Industry guidelines
- Quantitative Performance Measures of the HSE-MS

Contractual requirements, which will change from project to project, should be referenced in a Project HSE Plan (see Chapter 4).

#### **Assignment of responsibilities**

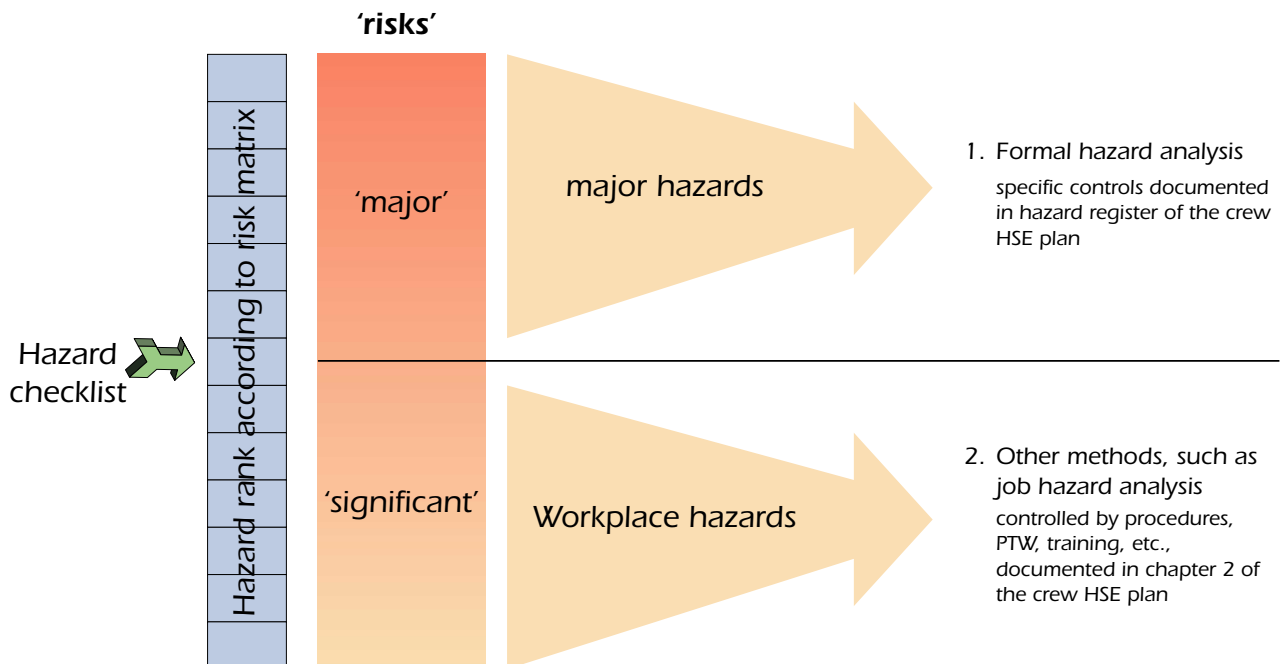
The establishment of responsibilities can be split into two areas:

- the responsibilities for establishing and maintaining the Crew HSE Plan itself;
- the responsibilities that are directly attributed to the controls and recoveries defined within the hazard management system.

The output of the process described above will be a set of hazard sheets, the Hazard Register.

A key element of the HSE-MS on the crew is to ensure that individuals, including subcontractors, are made aware of and held accountable for conducting the specific activities relating to the controls and recoveries defined in the hazard register. A more detailed discussion is given in Appendix 2.

Figure 2: Hazard Analysis Level



#### 3.3.1.4 The remedial action plan

Areas where practical implementation of the Crew HSE Plan is insufficient are documented in the remedial action plan. Information from the following sources can be included:

- Inspection/Audit findings (internal & external)
- Hazard register (missing controls / recoveries)
- HSE meetings
- Incident investigations
- Emergency responses exercises/drills
- Management reviews

#### 3.3.2 Use of a Crew HSE Plan in the operational environment

The involvement of all levels of the crew and management is essential in compiling the Crew HSE Plan.

A mechanism must exist at all levels that allows input to the Crew HSE Plan such as through HSE meetings and in conducting Job Safety Analyses.

The Crew HSE Plan benefits should be highlighted:

- Opens communication lines and feedback
- Improves efficiency of the operations by i.e. reducing the possibility of error, time loss, etc.
- Helps in team building

- Improves “ownership” of procedures and processes

Changes to the Crew HSE Plan must be communicated to all staff in a timely manner. Ensure that the procedure to update the Plan is understood and that a custodian of the Plan is appointed.

There are two important links between the Crew HSE Plan and individual staff members’ job descriptions (see also section 3.3.1.3):

- A general responsibility of all staff is to constantly review hazards in their work area, and to feed back results into the Crew HSE Plan, either into the procedures, or into the hazard register. Job safety analysis and scheduled reviews of hazard sheets and procedures should be part of each individual’s jobs and responsibilities.
- Control and recovery tasks as determined in the hazard sheets and assigned to individual staff should be attached to that person’s Job Description.

The Crew HSE Plan resides with the crew senior staff but must be accessible to other staff. Key elements of the relevant sections of the Crew HSE Plan containing relevant hazard sheets, procedures, meeting schedules, cross audit schedules, incident reporting, etc. should be distributed to each department.

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

- 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 meetings.
- 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.

### 3.3.3 *Document control issues*

The Crew HSE Plan is a ‘living’ document. It is subject to change as hazards, working conditions, working practices and other references are changed. Efficient updating of certain sections (notably the Hazard Sheets) may require the use of electronic databases, but it can be difficult to establish if the information has actually reached the end user. Paper-based systems are often slow in dissemination of information and cumbersome to handle.

Using a mixture of these methods, changes /updates can be sent to a crew quickly by electronic means and then a paper system used to get the information to the individual departments / workers.

It is essential that an individual on the crew is given overall responsibility to ensure that documents are updated in their local operation and that updates are distributed to those they affect.

In situations where multiple crews are involved, a centralised resource can be used to administer the documentation which will assist the transfer of experience gained from one crew to another.

To provide “traceability” to changes in the HSE-MS and to know why such changes were made, a document history should be maintained.

## 4 Project HSE plan

### 4.1 Objectives

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The purpose of the Project HSE Plan is to:

- Provide assurance of the effective working of the interface between the HSE Management Systems of Company and Contractor at the project specific level (see Section 1.4, Figure 1) and to document this interface.
- Demonstrate that both parties (Company and Contractor) have the necessary procedures (e.g., Permit to Work, Hazard and Risk Assessment, Operating Instructions, Contingency Plans) and controls in place to achieve the work program 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 (or not adequately) covered in the Crew HSE Plan.
- Document the Project Emergency and Contingency Plans.

For some operations, it will be acceptable to incorporate the content of the Project HSE Plan into the Crew HSE Plan. This is more likely on land operations.

The Project HSE Plan should be short and concise and complimentary to the Crew HSE Plan. Duplication should be avoided.

### 4.2 Contents and format

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The Project HSE Plan is a joint Company/Contractor document, that can follow either Company's or Contractor's Project HSE Plan document model.

The Project HSE Plan may be issued as an integral part of an overall project plan covering a wider scope (i.e. also including Quality and technical issues), 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. The Contractor may wish to include key issues from the Crew HSE Plan as a means to improve dissemination/familiarity with such issues, but it is recommended to keep the contents of the Project HSE Plan to a minimum.

For the same reason, the Project Plan may refer to higher level Company and/or Contractor documents such as HSE Policies and HSE objectives and targets, but duplication should be kept to a minimum.

The intent of this proposed standard 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.

A suggested structure for the Project HSE Plan is given below with a summary of main topics.

#### 1. *Introduction and Purpose*

- Custodian
- Signatories
- Purpose

#### 2. Project Description

- Description/Work programme
- Special characteristics

#### 3. *Management System Interfaces*

- Leadership and Commitment
- Policy and Strategic Objectives
- Organisation, Resources and Documentation
- Evaluation and Risk Management

- Planning and Procedures
- Implementation and Monitoring
- Auditing and Reviewing

#### 4. Contingency and Emergency Response Plans

- Company emergency response centre
- Emergency services
- Contact numbers

#### 5. Project Specific Hazard Register (optional)

A more detailed list of contents of the first four chapters, in the form of a checklist, is given in Appendix 1.

It is recommended that a checklist is developed on the basis of this outline checklist. Such a “System Interfacing Matrix” could contain the following functionality:

- To record which party will take responsibility for the issue in question (Company, Contractor, Others - e.g. Subcontractors).
- To reference Company, Contractors and/or other parties’ policies, procedures, codes of practice, etc. Such references should be specific and detailed - e.g. state whose document, document title and reference number.

## 4.3 Implementation

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### 4.3.1 Development of a project HSE plan

#### 4.3.1.1 General

The Project HSE Plan may involve only the Contractor (eg. Spec surveys) or be a joint Company/Contractor document where both parties are responsible for its completeness and quality. Compilation in the latter case could be under the prime responsibility of either Company or Contractor.

Advantages of giving this responsibility to the Contractor, using his own standard format, are:

- It ensures that the crew staff has a similarly structured document from project to project (although the content details may well change significantly) that they can familiarise themselves with in a minimum of time.
- It allows the Contractor to decide how this document will fit into any overall project plan.
- The Contractor should ultimately be responsible for deciding how to document project specific hazards and controls (see section 4.3.1.3). This is more easily achieved if the Contractor has the responsibility for compiling the Project HSE Plan in addition to their overall responsibility for the Crew HSE Plan.
- Hazard sheets in the Project HSE Plan should use the same format as those in the Crew HSE Plan, and it should be possible to use the same system for assigning controls to individuals.

Advantages of giving this responsibility to the Company are:

- The Project HSE Plan is to a large extent determined by the specific nature of the Project, the type of environment and the legal framework. The Company may initially be more familiar with these issues based on previous projects.
- The Company will need to be familiar with the Contractor’s HSE-MS, and as such is in a better position to establish differences and gaps with its own HSE-MS and related requirements.

Company and Contractor should agree at an early stage of the project preparations who will be responsible for the compilation of the Project HSE Plan.

#### 4.3.1.2 The documentation process

The basis for generating the Project HSE Plan will generally be:

- Previous client/contractor experience with similar projects in the same area. Ideally a previous Project HSE Plan or at least a final project report will be available as a starting point.
- Initial scouting carried out by the Company and additional more detailed scouting carried out by Contractor, identifying notably the area specific hazards and e.g. available operational support such as medical resources and heli-pads. Contractors should be informed of such hazards (and minimum required controls) and resources at the time of tendering, and the specific controls proposed by the



Contractor documented in the Project HSE Plan if not already done so in the Crew HSE Plan.

- Other key interfacing elements required to be documented as per Tender Invitation requirements.
- Legal requirements, such as reporting requirements to external parties, specific environmental restrictions, etc.
- An analysis by the Company of differences and gaps between the Contractor HSE-MS as implemented (and documented in the Crew HSE Plan) and the Company's HSE-MS requirements.
- Specific information provided by the Company. This could be made available during pre-mobilisation and planning meetings, but part may already be provided at the tendering stage.

Regardless of whether Contractor or Company takes final responsibility for the compilation of all required data into the Project HSE Plan, Company and Contractor should each assign a custodian, taking responsibility for the quality of the information provided, and for proper dissemination of the document within their respective organisations.

Ultimate responsibility and ownership of the Project HSE Plan should be assigned to a senior management level in the Company and Contractor organisations. These managers should authorise and sign the document before issuing.

Both Company and Contractor should maintain a model Project HSE Plan for each type of geophysical operation regularly executed. One of the purposes of this guideline is to propose a standard structure for such a model Project HSE Plan for use when initially setting up the model. This model Plan should be updated on the basis of experiences during new projects.

#### 4.3.1.3 The Hazard Management System

The Hazard Management System for Project specific hazards consists of the following steps:

##### I Identification and assessment of hazards

This should initially be done by the Company, based on previous survey information and information obtained during pre-tender scouting trips. Results of this initial identification and assessment will be included in the Invitation to Tender. Further information will most likely have been obtained by the Contractor during their scouting trip in preparation for the Tender.

More detailed assessments may be done jointly or by the Contractor during the pre-mobilisation phase.

## 2. Definition of controls and recovery measures

The Company will normally include minimum requirements for key controls and recovery measures (based on the hazard identification and assessment above) in the Invitation to Tender.

Further controls and recovery measures may be necessary on the basis of further assessments as described above.

A decision will then have to be made as to how and where to document these hazards and their controls. There are four options:

- a) In the form of a Hazard Sheet in the Crew HSE Plan Hazard Register

This is the preferred option if the Hazard has a "major" risk (see 4.3.1.3) and the Hazard is one that the crew is likely to come across in future projects. The advantage of including it in the Crew HSE Plan is that it will then easily fit in the crew "system", and it will be easier to assign controls to individual staff.

This will however increase the size and complexity of the Crew HSE Plan and will result in additional effort in updating the Crew HSE Plan.

- b) In the form of a Hazard Sheet in the Project HSE Plan

This option should be chosen if the Hazard has a "major" risk, but is so project specific that incorporating it in the Crew HSE Plan is not considered worthwhile.

This option does require however a secondary system to ensure that related controls are properly assigned and disseminated to individual staff.

Where (some) controls need to be assigned to Company staff, this is probably the preferred option.

*NOTE: For a description of the Hazard Sheet, see Chapter 3.2.4*

- c) In the form of an additional (or adapted) procedure /work instruction under the Crew HSE Plan

If the Hazard does not have a "major" risk, but can be adequately controlled by an additional or adapted procedure/work instruction or other measure (e.g. PTW), then this procedure or measure can be included in the Crew HSE documentation if considered to be of sufficiently general use i.e. in future projects.

- d) In the form of a special procedure under the Project HSE Plan

If the Hazard has no “major” risk and is not of sufficient general interest to the crew, then the procedure can be included as a special procedure in the Project HSE Plan. Proper dissemination to all relevant parties is then crucial.

#### **4.3.2 Use of a Project HSE Plan in the operational environment**

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 the contents of the Project HSE Plan. Staff should notably 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 medevac arrangements) immediately before or 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 the Project HSE Plan).

On a regular and fixed basis, both the Company and Contractor focal points for the Project HSE Plan should review the document in 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.

#### **4.3.3 Document control issues**

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 OIM’s, Port Authorities, etc.).

Changes, particularly at the start of new projects, will also in general occur more often than is the case with the Crew HSE Plan.

For this reason, and in view of the relative simplicity of the document (there will generally not be a database necessary for the few Hazard Sheets), it is recommended that dissemination is done entirely on paper.

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.

# Appendix 1 - Project HSE Plan: Detailed Checklists

This appendix provides headings and subject material that should be used as the basis for defining the scope and requirements of the Project HSE Plan.

The following is a checklist of the principal headings with an expansion into key checklist items (Tables A1.1 to A1.4) given on the following pages under the respective headings.

**Table A1.1 Section 1 Introduction and Purpose**

|                                 | <b>Checklist items</b>   | <b>Checked</b> |
|---------------------------------|--|----------------|
| <b>Introduction and Purpose</b> |  |                |
| Custodian                       | The designated custodian of the Project HSE Plan should be stated together with the Company Project Leader responsible for producing and distributing the Project HSE Plan   |                |
| Signatories                     | The Project HSE Plan should be signed by Project leader and a senior Contractor representative.  |                |
| Purpose                         | The purpose of the document is stated, which is to provide a clearly defined interface between the Company and Contractor during project execution and to ensure that Project specific hazards have been identified. |                |

**Table A1.2 Section 2 Description of the Project**

|                                   | <b>Checklist items</b>   | <b>Checked</b> |
|-----------------------------------|--|----------------|
| <b>Description of the Project</b> |  |                |
| Description                       | For the benefit of all of those parties impacted by the geophysical operation including Company, Geophysical Contractor, other Company Contractors and other third party organisations, a description of important project specific issues such as: <ul style="list-style-type: none"> <li>▪ project area</li> <li>▪ restricted areas</li> <li>▪ terrain</li> <li>▪ camp locations</li> <li>▪ types of equipment used</li> <li>▪ number and types of vessels used</li> <li>▪ cable / energy source configurations</li> <li>▪ local physical hazards e.g. rivers, lakes, pipelines, offshore structures, shipping lanes, fishing activity, conflicting operations etc.</li> </ul> |                |
| Project Specific                  | If required for the benefit of relevant third parties, a basic description of the geophysical operation and any special characteristics e.g. dual vessel, platform undershoot, special environmental requirements, difficult terrain etc.  |                |

**Table A1.3 Section 3 Management System Interfaces**

|  | <b>Checklist items</b>   | <b>Checked</b> |
|--|--|----------------|
| <b>Policy and Objectives</b>                       |  |                |
| Policies   | Identify and reference applicable Company and geophysical Contractor HSE policies (actual policy documents can be appended if appropriate)   |                |
| Project Objectives and Targets                     | Summarise project HSE targets  |                |
| <b>Organisation, resources and documentation</b>   |  |                |
| Reporting Structure between Company and Contractor | A diagram which shows the reporting structure between Company and Contractor indicating HSE focal points and including any external HSE and Medical Advisers, Company Reps etc.<br>Includes a summary of HSE responsibilities and authorities of key project staff<br>If applicable, describe the organisational interface with e.g. supply vessels, platforms, onshore facilities, local government bodies, police etc.   |                |
| Resources  | Description of other Company HSE and operational support resources if considered relevant. Other Contractor staff resources should be included if relevant and not described in the Crew HSE Plan.   |                |
| Sub-contractors                                    | Provide details of project specific Subcontractors e.g. caterers, chase vessel etc. not described in the Crew HSE Plan.<br>Include reporting structure between Contractor and Sub-contractors, definition of responsibilities, etc.  |                |
| Company / Contractor Communications                | A description of the Company/Contractor HSE communication and reporting schedule (frequency and method of information transfer   |                |
| Routine HSE Information                            | An agreed list of routine HSE and other information to be regularly communicated from Contractor to Company to include: <ul style="list-style-type: none"> <li>▪ safety/hazard information</li> <li>▪ change information (e.g. change in work programme, personnel, methods, procedures etc.)</li> <li>▪ emergency information</li> <li>▪ HSE reporting requirements (performance, incidents, near misses etc.)</li> </ul> |                |
| HSE Meeting Structure                              | A description of the joint Company / Contractor HSE meeting structure and frequency  |                |
| Meetings with third parties                        | A description of the HSE meetings with external bodies / third parties involving Company and Contractor  |                |
| Standards and Legislation                          | Describes specific standards (from Company 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, drills, exercises etc.<br>Summarise project specific competence assurance processes.  |                |

| <b>Hazard Management</b>         |  |  |
|----------------------------------|--|--|
| Risk Assessments                 | <p>Details of the process used by Company / Contractor to manage project specific risks not addressed in the Crew HSE Plan (e.g. Risk assessment Matrix, joint Hazop meetings etc.)</p> <p>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</p>   |  |
| Environmental Impact Assessments | Summarise any EIAs carried out specifically for the project and list actions arising from such EIAs  |  |
| <b>Planning</b>                  |  |  |
| Project Specific Procedures      | <p>A summary of project specific procedures to include for example:</p> <ul style="list-style-type: none"> <li>▪ duty rosters</li> <li>▪ crew changes</li> <li>▪ transfer of personnel</li> <li>▪ weather constraints</li> <li>▪ small boat operations</li> <li>▪ operations near fixed structures</li> <li>▪ helicopter movements</li> <li>▪ camp construction and camp moves</li> <li>▪ drug / alcohol testing</li> <li>▪ waste management</li> <li>▪ exclusion zones</li> <li>▪ special PPE requirements</li> <li>▪ PTW</li> <li>▪ agreed other restrictions not included in Crew HSE Plan</li> </ul> |  |
| Safety Critical Information      | A summary of critical safety information passed from Company to Contractor and from base to crew e.g. maps and charts, hazard notifications on structures, vessel/rig and well movements, diving activities etc.   |  |
| Company/Contractor Drills        | List any agreed joint or Contractor emergency drills/exercises to be carried out over and above those described in the Crew HSE Plan   |  |
| Permitted Operations             | List agreed operational restrictions to be applied over and above those defined in the Crew HSE Plan and/or the Contractor HSE Manual.   |  |
| Change Procedure                 | <p>Describe the change procedure for e.g. programme, and procedure changes (authorisation process, hazard assessment, etc.)</p> <p>Describe the change procedure for staffing level or personnel changes (authorisation process, etc.)</p> <p>Describe the procedure for exemption to standards, including who can approve such exemptions.</p>  |  |

| <b>Implementation and Monitoring</b> |   |  |
|--------------------------------------|---|--|
| Performance Indicators               | A description of the HSE performance indicators for the project (to the extent not covered under Policy and Objectives above)   |  |
| Joint Review                         | A process and schedule for a joint review by Company and Contractor of HSE performance against targets  |  |
| Incident Reporting                   | A description of the project incident reporting requirements, incident potential rating standards   |  |
| 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  |  |
| <b>Audits and Reviews</b>            |   |  |
| Project audits                       | Describes the joint Company/Contractor audit and review schedule  |  |
| Incident Investigation               | Describes project incident investigation requirements including : <ul style="list-style-type: none"> <li>▪ team composition</li> <li>▪ follow-up procedures</li> <li>▪ spill reporting</li> </ul> |  |

**Table A1.4 Section 4 Contingency and Emergency Response Plans**

|   | <b>Checklist items</b>   | <b>Checked</b> |
|---|--|----------------|
| <b>Contingency and Emergency Response Plans</b> |  |                |
| Summary   | Summarises emergency response procedures   |                |
| Company Emergency Response Centre (ERC)         | Describes the role of the Company ERC and the circumstances in which the ERC should be contacted                     |                |
| Emergency Services                              | Describes the emergency services that are available in the event of an emergency e.g. coastguard                     |                |
| <b>Contact Numbers</b>                          |  |                |
| Contact Numbers                                 | Contact telephone, fax, email, etc. numbers for all relevant project personnel, third parties and emergency services |                |

## Appendix 2 Allocation of responsibilities

An important element of an HSE Management System is to clearly specify individual responsibilities for HSE critical activities and tasks. This is the only effective method to ensure that such activities and tasks are carried out, and that required hazard controls are implemented and maintained. It is recommended to develop Job Descriptions containing responsibilities for each supervisory position on a geophysical operation.

### I Job description elements

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A Job Description should contain the following key elements:

#### *a) HSE critical activities*

Geophysical operations involve a number of managerial activities that, although not “hazardous” in themselves, are critical for the proper and safe conduct of the operation. Examples of such activities are:

- Scouting of new area
- Hazard identification and assessment
- Deciding mode of operation
- Defining and providing training
- Defining equipment standards and procuring equipment
- Defining requirements for and establishing infrastructure and camp
- Defining manning level requirements, and managing staff
- Operating camp facilities (catering, etc.) and medical services
- Executing transport (Journey Management System, etc.)
- Scheduling field operations
- Maintenance of equipment (mechanical, electronic, etc.)
- Restoring site(s)

Each of these activities should be assigned to a (senior) accountable party via their Job Description. It is recommended to establish a list of such activities, and to ensure that each is assigned to an individual.

Special attention should be given to the activity “Hazard Identification and Assessment”. This activity will be the ultimate responsibility of the most senior person on the crew, and will involve the use of the scouting report, existing operations reports, generic hazard lists, Company “Hazard Notifications”, etc. The responsi-

bility for this key activity (which should be continuously reviewed throughout a survey) should be explicitly included in the Job Description. Results should be documented in Hazard Sheets or other suitable documents. As a minimum, there should be documented evidence that a thorough analysis has been completed.

It is important to recognise the need for wide participation in the Hazard Identification process from all involved parties such as clients, operators, license holders in the area, third parties, etc.

#### *b) Tasks and Hazard Controls*

Each Activity will generally consist of a number of distinct tasks, which may not all be carried out by the person ultimately responsible for the activity. It is recommended that such tasks are listed separately, and are each assigned (delegated) to individuals reporting to the senior accountable party for the Activity. In this way a list of tasks is generated for individual positions on the crew. Such a list may be (but is not necessarily) linked to the Job Description.

An example is the Activity “Operating Camp Facilities”, which will have a large number of tasks such as:

- Supervision of catering facilities
- Supervision of sanitary facilities
- Food and water supply
- Waste removal

In addition, the Hazard Register will generate a number of required barriers, controls and recovery measures. These will each have control tasks related to them, to ensure implementation, maintenance and checking of these barriers, controls and recovery measures. Each such task should be added to the task list for individual positions.

#### *c) Procedures/work instruction*

Normal workplace hazards are usually not formally analysed in the Hazard Register, but control is established by procedures. Each supervisor should be made

responsible for proper review and implementation of the procedures/work instructions applicable to his section. It may be advisable to formally link the applicable procedures to his Job Description. A related crosscheck list of procedures against supervisory staff would also facilitate the document control system for procedures in case of an update (e.g. by allowing easy identification of staff that need to be given an update of a procedure after review).

#### *d) Formulation of responsibilities*

Responsibilities should be formulated in language that is as clear and specific as possible.

- Where applicable, it should specify for example what input (document such as 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 formulation.

- Reference or Standards Documentation applicable to an activity or task should be mentioned or referred to.

#### *e) 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.

#### *f) 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 hazard controls assigned to their subordinates are carried out properly (and according to set targets), and that their staff meet the defined competence requirements.

## 2 Link to the Hazard Register

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The Hazard controls form a link between the Hazard Register and the Job Descriptions. Although such a system can be set up entirely as a “paper” system, this is in practice cumbersome, and later updating is complex and error prone. Previous experience has shown that “paper” systems are not properly maintained, and changes are not effectively passed down to the work site.

It is recommended to implement a database that allows easy linking of the various parts of the HSE Plan (notably Hazard Register, Job Descriptions and Procedures), to allow for easy manipulation and updating.

## 3 Implementation

---

To ensure that staff are well aware of their responsibilities, it is recommended that:

- Each staff member signs their Job Description to indicate they have read and understood it.
- Staff are issued with a copy of the (signed) Job Descriptions

### **Generic HSE Responsibilities for Company and Contractor Key Personnel**

(Reprinted from Appendix 1 of OGP M2)

#### *Company*

##### *Contract Holder Should:*

- conduct a structured HSE assessment of the anticipated contract;
- pre-qualify Contractors for the bidders list using standard HSE criteria;
- prepare Contract HSE specifications for inclusion in the tender documentation;
- prepare a HSE monitoring programme defining the role of Company Representative(s) in ensuring that the Contractor’s HSE Plan is finalised and followed;



- prepare Company audit and review programme and secure appropriate resources;
- evaluate HSE Plans;
- assure the adequacy of HSE Plans;
- appoint competent Company Representative(s);
- supervise Company Representative(s);
- conduct a pre-execution HSE audit;
- authorise the Contractor to commence work if the pre-execution HSE requirements are met;
- monitor the performance of the Contractor against his HSE Plans;
- authorise deviations from the Contractor's HSE Plans;
- apply sanctions in the event of unauthorised deviations from the Contractor's HSE Plans;
- prepare a HSE close-out report.

*Company Representative should:*

- perform assurance checks on Contractor's review and inspections and follow up;
- verify hazards and effects management controls, as specified in Contractor's HSE Plans, are implemented;
- identify deficiencies in Contractor's HSE Plans and agree remedial action with Contractor or instigate sanctions in consultation with Contract Holder.

*Company Site Representative*

Where a Contractor may be working in a number of areas it is common for a Company to nominate someone who is responsible for the supervision of the physical work being executed under the contract at a specific appointed site. The Site Representative's HSE responsibilities follow those of the Company Representative, but are specific to the site.

*Company HSE Adviser*

Where there is access to Company HSE advisers or specialists, it is important that the role of the adviser is understood to be indeed that of an adviser. Advice, support or services may be sought from an HSE Adviser on a routine or periodic basis but the responsibility for HSE matters on the contract must remain unmistakably with the Contract Holder and representatives.

Normally, the HSE advisor provides:

- advice and support in HSE issues as requested

- review/audit services as requested
- additional advisory support, where needed, to small Contractors.

In the case of a small local Contractor a decision may have been taken to provide additional supervisory support and assistance in HSE matters. The Company HSE adviser may be tasked with providing support but must exercise care that this is recognised as a temporary phase and that the Contractor must be encouraged to develop quickly to a point where such assistance is no longer required.

*Contractor*

*Contract Manager should:*

- prepare and assure quality of Contractor's HSE Plan
- define competencies required for HSE critical positions
- assign appropriate personnel to HSE critical positions
- assure adequate resources and time in the schedule to manage the contract in accordance with the Contractor's HSE Plan
- notify the Contract Holder in writing of his nominated Contractor Representative(s) and Contractor Site Representative(s)
- provide resources to implement remedial actions following audits in an expeditious manner.

*Contractor Representative should:*

- fulfil the pre-execution HSE requirements
- implement the Contractor's HSE Plan
- seek formal approval from the Contract Holder for any proposed deviations from or amendments to the Contractor's HSE Plan
- implement additional requirements imposed by the Contract Holder.

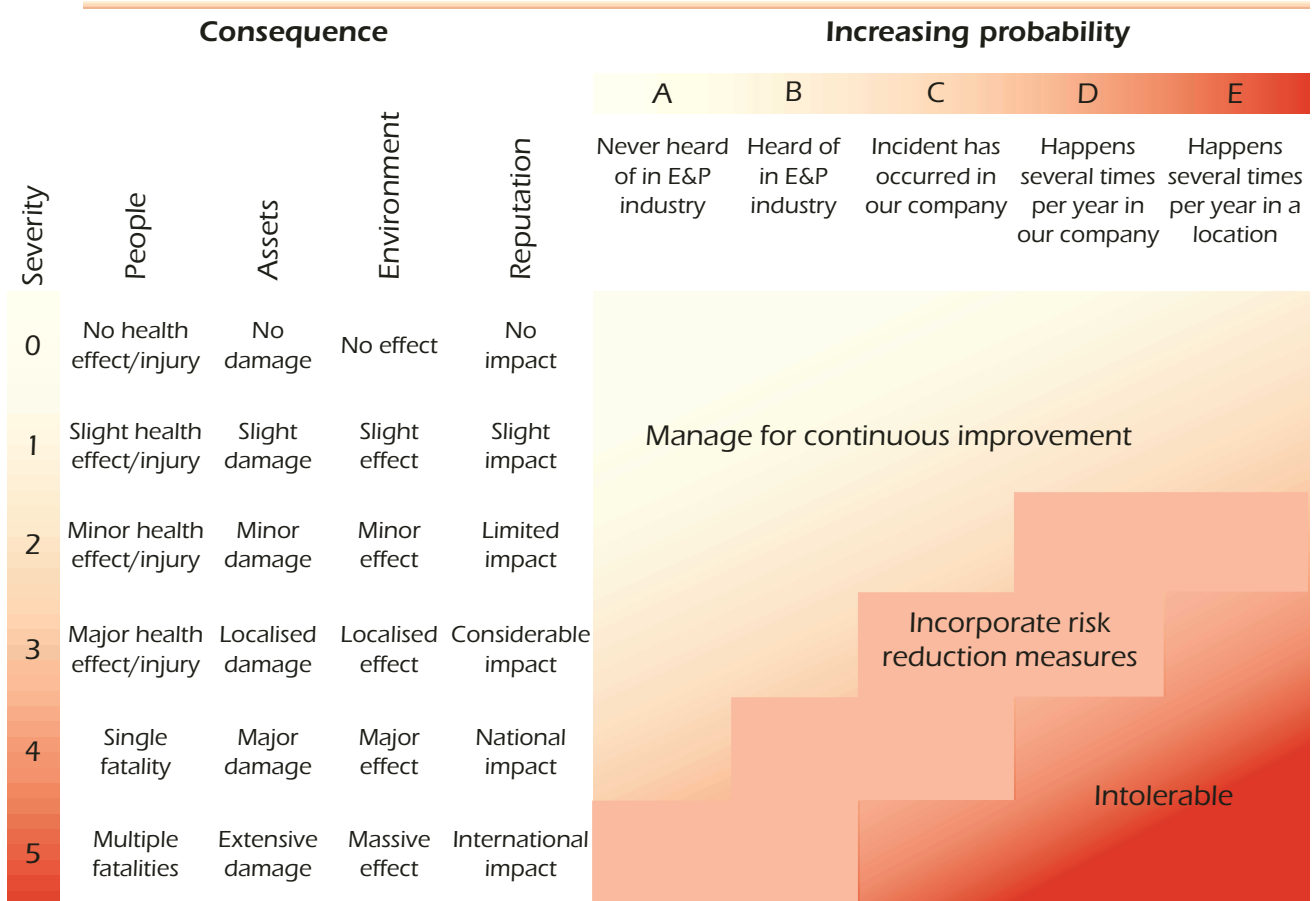
*Contractor Site Representative*

Where a Contractor may be working in a number of areas it is common for the Contractor to appoint a person or persons to assume responsibility on behalf of the Contractor Representative to supervise the work being executed under the contract in the specific area. The HSE responsibilities are as for the Contractor Representative but with responsibility for a specific site.

# Appendix 3 Risk Assessment Matrix

Risk Assessment should take into account both the potential consequence of the release of a hazard and the probability of such a consequence materialising. For this purpose use could be made of a “Risk Assessment Matrix”, an example of which is given below:

Figure 3: Risk Assessment Matrix



Note that the consequence and probability categories and the extent of the black and grey areas may be tailored to suit individual Company’s philosophies and activities.

For geophysical operations probability category descriptions could for example be:

- A. Never heard of in geophysical operations
- B. Has occurred in geophysical operations
- C. Incident has occurred in similar geophysical operations
- D. Happens several times a year in similar geophysical operations
- E. Happens regularly in this type of geophysical operation

# Appendix 4 Reference Documentation

## HSE Management

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|        |   |
|--------|---|
| OGP M1 | Guidelines for the Development and Application of Health, Safety and Environmental Systems - Report 6.36/210 1994 |
| OGP M2 | HSE Management - Guidelines for working together in a contract environment - Report 6.64/291 1999                 |
| OGP M3 | HSE Competence Assessment and Training Guidelines for the Geophysical Industry - Report 6.78/292 1999             |
| OGP M4 | Guidelines for HSE Auditing in the Geophysical Industry - Report 6.53/245 1996                                    |
| OGP M5 | Generic Hazards Register for Geophysical Operations - Report 6.40/217 1994  |
| OGP M6 | Glossary of HSE Terms - Report 6.52/244 1996  |
| OGP M7 | Response to demonstrations at offshore facilities - Report 6.90/309 2000  |
| OGP M8 | Response to demonstrations at company premises - Report 6.89/308 2000   |
| OGP M9 | Quantitative Performance Measures of HSE-MS Effectiveness - Report 6.61/260 1997                                  |

## Health

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|        |   |
|--------|---|
| OGP H1 | Health Management Guidelines for Remote Land - based Geophysical Operations Report 6.30/190 1993  |
| OGP H2 | Substance Abuse Guidelines for management Report No. 6.87/306 June 2000                           |
| OGP H3 | Standards for Local Medical Support Report 6.44/222 1995  |
| OGP H4 | Health Assessment of Fitness to work in the E&P Industry Report 6.46/228 1995                     |
| OGP H5 | Guidelines for Control of Blood borne Pathogens in the E&P Industry Report 6.55/251 1996          |
| OGP H6 | Health Aspects of Work in Extreme Climates within the E&P Industry -The Cold Report 6.65/270 1998 |
| OGP H7 | Health Aspects of Work in Extreme Climates within the E&P Industry -The Heat Report 6.70/279 1998 |

## Safety

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|           |   |
|-----------|---|
| OGP S1    | Aircraft Management Guide. Report 6.51/239. 1998.                         |
| IAGC S2   | Guidelines on the Use of Work Boats in Marine Geophysical Operations 2001 |
| OGP S3    | Land Transport Safety Guidelines. Report 6.50/238. 1996.                  |
| OGP S4    | Guidelines on Permit to Work Systems. Report 6.29/189. 1993.              |
| IAGC S5:  | Land Geophysical Operations Safety Manual, IAGC, 1997.                    |
| IAGC S6:  | Marine Geophysical Operations Safety Manual, IAGC, 1997                   |
| SOLAS S7: | International Convention for Safety of Life at Sea.                       |

## Environment

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|           |  |
|-----------|--|
| OGP E1    | Environmental Management in Oil and Gas Exploration and Production. 1997.  |
| OGP E2    | Oil and Gas Exploration and Production in Mangrove Areas. Report 2.54/184. 1993.   |
| OGP E3    | Oil Industry Operations Guidelines for Tropical Rainforests. Report 2.49/170. 1993.  |
| OGP E4    | Oil and Gas Exploration and Production in Arctic and Subarctic Onshore regions. Report 2.55/184. 1993.                           |
| OGP E5    | Exploration and Production Waste Management Guidelines. Report 2.58/196. 1993.   |
| IAGC E6   | Environmental Guidelines for World-wide Geophysical Operations, IAGC, 1994 / 2000  |
| MARPOL E7 | International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto. |

# Appendix 5 – Model Contract Clause: HSE Schedules for Geophysical Contracts

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 Schedules a condition of contract. The basis for the HSE Schedules is *OGP/IAGC HSE schedules (Attachment 1 Report 6.92/317 May 2001)*. However, Company and Contractor will also be able to list any exceptions to these industry standard clauses. This will provide a consistent way for Company and Contractor to review Invitations for Tender and Contracts established for the work.

Articles 4 and 5 contain examples of the application of exception clauses for both Company and Contractor.

## Article 1 Company HSE Policy

*The Company HSE policy (or an explicit reference to it) are provided here.*

## Article 2 Applicable HSE Standards

The HSE standards applicable for the performance of the project under this Agreement 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.
- c) Industry HSE standards adopted by Company, as listed in Article 3 of this Schedule.
- d) General Company HSE standards and/or agreed Contractors variations as defined in Column 3 of the HSE Schedules.

Applicable legislation and regulations in the area of operations shall always prevail, unless a formal exemption is granted to Contractor or Company by the relevant authorities. However, where the standards defined under b), c) or d) 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) and c) 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, Contractor shall immediately notify Company of such absence or inadequacy of defined standards. Company 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. Company shall make a reasonable contribution towards the additional cost of implementing such additional standards.

## Article 3 Industry Minimum HSE Standards Adopted by Company

The Company has adopted the OGP/IAGC HSE schedules (Attachment 1 Report 6.92/317 April 2001). Amendments required by the Company are listed by the contents of column 3 as Company's Exceptions in Article 4 below. Amendments required by the Contractor and accepted by the Company are listed by the contents of column 3 as Contractor's Exceptions in Article 5 below.

The majority of the documents referred to in column 4 of the Schedules were written as guidelines and make recommendations in which the word "should" is used frequently. In the context of this Agreement, the recommendations in the sections of documents referred to in column 4 shall be binding and the "recommending" use of the word "should", is to be read as an imperative "shall".

#### Article 4 Company's Exceptions (example)

| Schedule number/item                   | Minimum expectation for the implementation of an HSE MS  | Remark, alternative or exception   | Reference(s) to requirements |
|--|--|--|------------------------------|
| 1.3.4 HSE competence                   |  |  |                              |
| 1.3.3 Resources: manning levels        | Manning levels shall 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 survey  |                              |
| 2.5 Marine seismic and support vessels |  |  |                              |
| Survival Suits (with insulation)       | Where operational conditions demand their use, the vessel shall be equipped with survival suits of appropriate sizes for all persons on board.<br><br>The survival suits shall be readily accessible and their position and donning instructions shall 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 Ch III Reg 33          |

#### Article 5 Contractor's Exceptions (example)

| Schedule number/item              | Minimum expectation for the implementation of an HSE MS  | Remark, alternative or exception   | Reference(s) to requirements |
|-----------------------------------|--|--|------------------------------|
| 2.4.2 Small boat safety equipment |  |  |                              |
| Vessel tracking system            | A tracking system should be fitted to all small boats operating in high risk environments, including but not limited to:<br><br>- a VTS central system/ operator to monitor and control crew vessel journeys in real time. | The workboats for this job are not fitted with an active VTS, but are equipped with GPS receivers. |                              |

# Glossary

This glossary is applicable to this document only and should not be used to define the meanings of the documents listed as references.

## *ALARP*

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

## *Audit*

1. A systematic, independent evaluation to determine whether or not the health, safety and 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 and environmental policy and objectives.
2. 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.

*Ref OGP report 6.52/244*

## *Buddy System*

System of work aimed at avoiding an individual working alone.

## *Burn Down Policy*

The policy adopted by organisations for the control of fires.

## *Carcinogens*

Any chemical, biological or physical agent that can potentially be a cause of cancer.

## *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 or a subcontractor.

## *Competence*

The ability to perform a particular job in compliance with performance standards.

*Ref OGP report 6.52/244.*

## *Compliance*

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

## *Contract*

A system of operating between two or more parties.

*Ref OGP report 6.52/244.*

## *Contractor*

An individual or company performing work for a client company, following verbal or written agreement to a contract.

## *Crew*

The group of people assigned to carry out the work and usually living in close proximity to the work location.

## *EIA*

Environmental Impact Assessment. Part of project management concerned with identifying through a formal written technical evaluation the likely impact (positive and 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.

*Ref OGP report 6.52/244*

## *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.

*Ref OGP report 6.52/244.*

## *Fly Camp*

A camp established for a limited period of time for seismic line operations.

**Hazard**

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

*Ref OGP report 6.52/244.*

**HRA**

Health Risk Assessment.

**HUET**

Helicopter Underwater Escape Training.

**HSE**

Health, Safety and Environment.

**HSE Professional**

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

**HIV**

Human Immunodeficiency Virus.

**Incident**

An event or chain of events which has caused or could have caused injury, illness and/or damage (loss) to assets, the environment or third parties.

*Ref OGP report 6.52/244.*

**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.

*Ref OGP report 6.52/244.*

**Journey management**

The planned movement of people and equipment from one place to another including communications, route, scheduled stops, hazard warnings, provisioning, breakdown and other contingency.

*Ref OGP report 6.52/244.*

**Lateral learning**

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

**Life jacket**

A flotation device designed to keep a person correctly wearing the device in a position in the water so that their mouth is above the surface even when the person is unconscious.

*see SOLAS Regulation 32.*

**Lifeboat**

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

**Lockout/Tagout**

A documented system of barriers and notices that prevents the accidental or inadvertent operation of equipment whilst it is being maintained or inspected.

*Ref OGP report 6.52/244.*

**MOB**

Man Over Board.

**MOPO**

Manual Of Permitted Operations.

### **MARPOL**

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

### **Material Safety Data Sheet (MSDS)**

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.

*Ref OGP report 6.52/244.*

### **Medevac**

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

*Ref OGP report 6.52/244.*

### **Near Miss**

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

*Ref OGP report 6.52/244.*

### **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 (potentially) hazardous. It is also a means of communication between site/installation management, plant supervisors and operators and those who carry out the work.

Essential features of a Permit to Work are:

- Clear identification of who may authorise particular 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 permits.
- Monitoring and auditing to ensure that the system works as intended.

*Ref OGP report 6.52/244.*

### **PFD**

Personal Flotation Device.

### **PPE**

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

*Ref OGP report 6.52/244.*

### **Policy**

1. The expression of the general intentions, approach and objectives of an organisation and the criteria and principles on which actions and responses are based.

2. 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.

*Ref OGP report 6.52/244.*

### **Proactive Indicators**

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

### **Reactive Indicators**

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

### **RCCB**

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

### **Risk**

1. The product of the chance that a specified undesired event will occur and the severity of the consequences of the event.

2. 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.

*Ref OGP report 6.52/244.*



***Risk Assessment***

A careful assessment by competent people of the hazards associated with a task. 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.

***Senior Managers***

Those managers or directors who have executive authority to determine and enact strategic policies within the organisation.

*Ref OGP report 6.52/244.*

***Stakeholders***

Independent parties who have a vested interest in the operation. Usually includes the general public.

***Subcontractor***

An individual or company performing work for a contractor, following verbal or written agreement to a contract.

***Survival Suit***

A garment, usually one piece, that provides protection to the wearer from harmful exposure, i.e. immersion in water, exposure to toxic environment, exposure to cold.

***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.

***Training***

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

*Ref OGP report 6.52/244.*

***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.

***VDU***

Visual Display Unit.

***Waste***

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

*Ref OGP report 6.52/244.*

***WHO***

World Health Organisation.



ATTACHMENT 1:  
HSE Schedules for Geophysical Contracts

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# TABLE 1: Minimum Expectations for HSE Management Systems

| <b>1.1 Leadership and Commitment</b>               | <b>Minimum expectation for the implementation of an HSE MS</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|--|--|---|-------------------------------------|
| Visible expressions of commitment by senior people | HSE matters placed high on personal and collective agenda.<br>All senior managers set a personal example to others.  |   | OGP M1 Sections 1 and S1            |
| Crew visits  | Senior management have a defined schedule of visits to seismic crew.<br>Crew/town/country-based supervisors visit their crews on a regular basis.  |   |                                     |
| Crew HSE targets.                                  | Supervisors and senior crew personnel have individually owned HSE targets and time-scales.   |   | See item 1.6.3 below                |
| HSE performance measurement                        | HSE targets and performance are measured and reported.<br>Senior management reviews corporate and crew HSE targets and time scales.  |   |                                     |
| Senior Management Involvement in HSE matters       | Senior managers are actively involved in HSE matters: <ul style="list-style-type: none"> <li>- they attend HSE meetings;</li> <li>- they personally instigate HSE audits and reviews;</li> <li>- they promote a positive culture at all levels.</li> </ul> |   |                                     |

| <b>1.2 HSE Policy statements</b> |   |  |                            |
|----------------------------------|---|--|----------------------------|
| Content of HSE policies          | Written HSE policy dated and signed by Chief Executive, which is in-line with the reference.  |  | OGP M2 Appendix 5 Table V2 |
| Dissemination of HSE policies    | HSE policies are disseminated on the crew in-line with the reference.<br>The main contractor and subcontractor(s) have been given a copy of the Company HSE Policy. |  | OGP M2 Appendix 5 Table V2 |

| <b>1.3 Organisation</b>                                    | <b>Minimum expectation for the implementation of an HSE MS</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>                |
|--|---|---|--|
| <b>1.3.1 Organisational structure and responsibilities</b> | The roles and responsibilities of the organisation are clearly defined, which include but are not limited to: <ul style="list-style-type: none"> <li>- senior/middle management within corporate and crew structure are clearly charged with the responsibility for HSE;</li> <li>- job descriptions are in place, showing each employee's (crew members and HSE professionals) HSE function, competencies and responsibilities;</li> <li>- there is an organisation chart available on the crew showing the organisation (Company, Contractor and subcontractors), including HSE professionals.</li> </ul> |   | OGP M1 Section 3.1<br>OGP M2 Appendix V Table V.3. |

| <b>1.3 Organisation</b>                      | <b>Minimum expectation for the implementation of an HSE MS</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>      |
|--|--|---|--|
| <b>1.3.2 HSE professionals</b>               | <p>Contractor shall have access to HSE professionals that will assist line management in:</p> <ul style="list-style-type: none"> <li>- crew HSE training;</li> <li>- HSE inspections and audits;</li> <li>- risk assessments;</li> <li>- maintenance and monitoring of policies, procedures, guidelines and HSE plans;</li> <li>- subcontractor HSE assessment;</li> <li>- HSE review / performance monitoring;</li> <li>- incident investigations;</li> <li>- contingency plans.</li> </ul> |   |  |
| <b>1.3.3 Resources: manning levels</b>       | Manning levels shall be defined appropriately as not to compromise safe execution of the operations.   |   |  |
| <b>1.3.4 HSE competence</b>                  |  |   |  |
| HSE competence and verification requirements | <p>HSE competence and verification requirements shall be covered in documented records including:</p> <ul style="list-style-type: none"> <li>- task identification;</li> <li>- task specific competencies (see reference);</li> <li>- task specific competent personnel.</li> </ul>  |   | OGP M3                                   |
| Visitor / crew induction programme           | Visitor / crew site induction programme shall be carried out in accordance with the reference within 24 hours of arrival on site.  |   | IAGC S5 1.3<br>IAGC S6 1.3               |
| Crew employee orientation programme          | <p>Employees shall receive an in-depth orientation within 24 hours of arrival on a crew. This shall include but not limited to information on:</p> <ul style="list-style-type: none"> <li>- HSE policies;</li> <li>- HSE awareness;</li> <li>- job descriptions;</li> <li>- work instructions;</li> <li>- basic survival;</li> <li>- emergency procedures;</li> <li>- incident / hazard reporting.</li> </ul> <p>Individual orientation records shall be maintained.</p>                     |   | OGP M3, Annex-2 Awareness Modules        |
| HSE training                                 | <p>Training requirements shall be listed for each individual task.</p> <p>A current list of personnel who have completed training requirement shall be maintained.</p> <p>Training programmes shall be designed to cover the requirements described within each module of the reference.</p>   |   | OGP M2 Appendix V Table V3<br><br>OGP M3 |
| HSE training (professionals)                 | Crew HSE advisors shall meet the competence requirements stated in the reference and any other local legal requirements.   |   | OGP M3<br>FMM1-21 inclusive.             |



| 1.3 Organisation   | Minimum expectation for the implementation of an HSE MS  | Remark, alternative or exception | Reference(s) to requirements  |
|--|--|----------------------------------|---|
| <b>1.3.5 Contractors</b>                                   |  |                                  |   |
| Ensuring HSE is part of contract objectives                | Contract objectives shall be defined to meet HSE objectives as well as those of time, cost and quality. <ul style="list-style-type: none"> <li>- HSE targets shall be realistic and consistent;</li> <li>- focal points within the team structure shall be designated the responsible persons for ensuring that all HSE matters have been identified for the contract;</li> <li>- Contractor shall ensure that diligence is being paid to the fulfilment of the contractual HSE specifications.</li> </ul>   |                                  | OGP M2  |
| Subcontractors   | The Subcontractors involved in the geophysical operation are included in HSE MS, including but not limited to: <ul style="list-style-type: none"> <li>- Subcontractors qualification process in place;</li> <li>- Subcontractors are part of the communication process;</li> <li>- Subcontractors are included in training programmes;</li> <li>- Subcontractors are part of the site reporting of near misses and incidents;</li> <li>- HSE performance of Subcontractors is monitored - objectives given, metrics agreed and tracked.</li> </ul> |                                  | OGP M1 3.5<br>IAGC S5 2.18<br>IAGC S6 2.11<br><br>OGP M2 Appendix IV Section 3<br><br>IAGC S5 4.1.1<br><br>IAGC S5 2.18 |
| <b>1.3.6 Communications</b>                                |  |                                  |   |
| Communications of HSE information relevant to the project. | Effective means of communications of HSE issues shall be established between the Company, Contractor and subcontractors and other stakeholders: <ul style="list-style-type: none"> <li>- Company's expectations on HSE management shall be communicated in depth to the crew;</li> <li>- procedures shall be established for the distribution of HSE documentation and for the reporting and review of HSE issues;</li> <li>- links shall be established to emergency services, communities, officials and other stakeholders.</li> </ul>          |                                  |   |
| Languages  | The need to provide HSE critical information in different languages shall be addressed.  |                                  |   |
| Suggestions  | A system shall be in place to allow the workforce and others to make and receive feedback to suggestions on HSE matters.   |                                  |   |
| Records  | Records are kept of the main communications on HSE matters.  |                                  |   |
| HSE meeting programme                                      | An effective hierarchy of HSE meetings is defined and implemented, which shall include but not limited to: <ul style="list-style-type: none"> <li>- regular HSE meetings for work units and skill pools (survey, drilling, vehicle and boat drivers etc.);</li> <li>- daily toolbox meetings for work units and skill pools (survey, line opening, drilling, drivers etc. before starting work);</li> <li>- actions arising from meetings are communicated and tracked.</li> </ul>   |                                  | OGP M2 Appendix V Table V.3<br>OGP M3 FMM1  |

| <b>1.3 Organisation</b>                               | <b>Minimum expectation for the implementation of an HSE MS</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>            |
|---|--|---|--|
| HSE promotion & awareness                             | Management regularly communicates on HSE to increase awareness: <ul style="list-style-type: none"> <li>- management leads by example;</li> <li>- successes and failures are openly communicated to all employees;</li> <li>- suggestions are recognised and acted on in a timely manner;</li> </ul> systems are in place to recognise, reward and encourage success. |   | OGP M2 Appendix V Table V.3                    |
| <b>1.3.7 HSE legislation, standards and documents</b> |  |   |  |
| Identification of HSE laws, rules and regulations     | All applicable HSE laws, rules and regulations of any government or regulatory body having jurisdiction over the work shall be identified and recorded.  |   | OGP M2 Appendix 5 Table V.3                    |
| 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 work shall be obtained.  |   |  |
| Adherence to applicable laws regulations and permits. | Company and Contractor shall adhere to all applicable HSE related legislation, rules, regulations and permits.   |   | OGP M2 Appendix 5 Table V.3<br>IAGC S5 Preface |
| Company HSE Standards                                 | Company shall inform the Contractor of any additional applicable HSE standards not covered by these schedules.   |   |  |
| Contractor HSE Standards                              | Contractor shall inform the Company as to their HSE, equipment design, operational and maintenance standards that meet the agreed HSE standards and obtain agreement on their use during the performance of the work.  |   |  |
| Document control                                      | HSE critical documents shall be controlled documents, eg: <ul style="list-style-type: none"> <li>- Key responsibilities;</li> <li>- Crew HSE Plan / Project HSE Plan;</li> <li>- Emergency Plans;</li> <li>- HSE critical procedures.</li> </ul>   |   | See Sections 3.3.3 and 4.3.3.                  |

| <b>1.4 Risk Management</b>  |   |  |             |
|---|---|--|-------------|
| <b>1.4.1 Risk management process (for generic and project specific risks)</b> | Assessment shall be carried out for: <ul style="list-style-type: none"> <li>- the generic risks associated with the geophysical crew that can be independent of project or client;</li> <li>- the project specific risks related to actual project and client/contractor relationship;</li> <li>- all the relevant major risks shall be identified assessed, recorded and ranked;</li> <li>- specific controls to mitigate the hazards shall be put in place;</li> <li>- responsible parties shall be assigned to implement the controls;</li> <li>- information on hazards and risks shall be communicated to the crew.</li> </ul> |  |             |
| <b>1.4.2 Training / competency of risk assessors</b>                          | The competence of those assessing risks shall meet the standard in the reference.   |  | OGP M3 FMM6 |
| <b>1.4.3 Risk reduction measures</b>  | Refer to Table 2 Specific risk areas for details on hazard and effect controls.   |  |             |

| <b>1.5 Planning and Procedures</b>   | <b>Minimum expectation for the implementation of an HSE MS</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>     |
|--|---|---|---|
| <b>1.5.1 Planning</b>  |   |   |   |
| Planning at the Company / Contractor and operations level for achieving HSE objectives | Planning is in place, which includes but not limited to: <ul style="list-style-type: none"> <li>- clear objectives set;</li> <li>- means to achieve the objectives;</li> <li>- resource requirements are defined;</li> <li>- HSE motivation programs;</li> <li>- performance feedback methods.</li> </ul>   |   | OGP M1 Section 5<br><br>OGP M1 Supp. S5 |
| Crew / Project HSE Plan  | A documented Crew / Project HSE plan be in place and inline with the reference guideline and shall meet the following: <ul style="list-style-type: none"> <li>- the HSE requirements of these Schedules;</li> <li>- demonstrate that major risks are ALARP;</li> <li>- work place hazards and effects are under effective control.</li> </ul><br>The relevant parts of the Crew/Project HSE Plan shall be available in the appropriate languages to ensure that incumbents of HSE critical positions fully understand their responsibilities.   |   | OGP M9 Chapters 3 and 4                 |
| Company/Contractor and Contractor/Subcontractor interfaces                             | Company and Contractor shall develop and document any required interface issues (e.g. in a Project Plan), including those for subcontractor operations.   |   | OGP M9 Chapter 4                        |
| <b>1.5.2 Asset Integrity</b>   |   |   |   |
| Procedures and systems   | Asset integrity management shall be carried out in accordance with the reference.   |   | OGP M1 Section 5.2                      |
| <b>1.5.3 Preventative Maintenance</b>  |   |   | IAGC S5<br>IAGC S6                      |
| An accurate inventory of equipment that requires maintenance is kept.                  | An inventory of all equipment, machinery and plants that require regular preventative maintenance shall be available, e.g.: <ul style="list-style-type: none"> <li>- vehicles;</li> <li>- vessels;</li> <li>- in water equipment</li> <li>- small boats, engines;</li> <li>- generators;</li> <li>- trailers;</li> <li>- fire detection and control equipment;</li> <li>- medical equipment;</li> <li>- air conditioners / Heaters;</li> <li>- cranes, winches, hoists;</li> <li>- workshop equipment (i.e. welding sets);</li> <li>- compressors;</li> <li>- water pumps;</li> <li>- chainsaws;</li> <li>- drill units;</li> <li>- water and waste treatment plants;</li> <li>- all terrain vehicles;</li> <li>- aircraft and Helicopters;</li> <li>- bulldozers etc.;</li> <li>- snowmobiles.</li> </ul> Inventory to include unique identification of all units. |   |   |

| <b>1.5 Planning and Procedures</b>                                  | <b>Minimum expectation for the implementation of an HSE MS</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>                           |
|---|---|---|---|
| Procedures and schedules  | <p>The preventative maintenance system should contain procedures and schedules pertaining to each item in the inventory which should include but not limited to:</p> <ul style="list-style-type: none"> <li>- inventory planning to include additional units to allow rolling stand-downs for maintenance;</li> <li>- go / no go directives from Management for units overdue for servicing;</li> <li>- management auditing of system;</li> <li>- documented procedures in place for correct servicing of each unit as per manufacturers guidelines;</li> <li>- documented schedules for servicing of each unit as per manufacturers guidelines.</li> </ul> |   | Relevant Equipment Maintenance Guidelines                     |
| Record Keeping.   | <p>The preventative maintenance system should contain detailed maintenance records.<br/>Service record sheets to be completed with each service, signed off by the Responsible Person, and filed , to include:</p> <ul style="list-style-type: none"> <li>- unit identification;</li> <li>- work done;</li> <li>- date;</li> <li>- total km / miles / operating hours on unit where applicable.</li> </ul>  |   |   |
| <b>1.5.4 Procedures and work instructions</b>                       |   |   |   |
| HSE procedures for Specialist Tasks                                 | All specialist tasks that require formal procedures or work instructions (e.g. require Permit to Work or Lockout/Tagout) have been identified and documented.   |   |   |
| Lockout/Tagout  | <p>A Lockout/Tagout procedure is in place, which includes but not limited to the requirements to:</p> <ul style="list-style-type: none"> <li>- identify all parts to be shut down;</li> <li>- advise all involved;</li> <li>- identify all power sources;</li> <li>- unique locking devices;</li> <li>- tagout all power sources and machines;</li> <li>- permit to work training;</li> <li>- effective transfer of information on outstanding permits during shift changes.</li> </ul>   |   | IAGC S5 8.2.1   |
| Working at Height   | Working at height above 2m (6 ft) shall be subject to a PTW system.   |   | IAGC S5 8.2.2   |
| Permit to Work  | A Permit to Work system should be in place that conforms to the referenced guidelines.  |   | OGP S4<br>OGP M3 MAM4<br>OGP M3 FMM9<br>IAGC S5 Section 8.2.3 |
| Basic site specific HSE rules applicable to all staff are available | <p>Develop and document a set of basic HSE rules that are applicable to all persons on the crew. Rules shall cover:</p> <ul style="list-style-type: none"> <li>- Safety, Health and Environment</li> </ul>  |   | OGP M2 Appendix V Table V.5                                   |

| <b>1.5 Planning and Procedures</b>                       | <b>Minimum expectation for the implementation of an HSE MS</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|--|--|---|-------------------------------------|
| Awareness of procedures, work instructions and HSE rules | A procedure shall be in place to communicate procedures, work instructions and HSE rules, which includes: <ul style="list-style-type: none"> <li>- distribution to all staff (translate to mother tongue for non-English speakers);</li> <li>- confirmation of receipt and understanding by every individual.</li> </ul>   |   | OGP M2 Appendix V Table V.5         |
| Revision of procedures, work instructions and HSE rules  | A procedure shall be in place for: <ul style="list-style-type: none"> <li>- periodic revision;</li> <li>- involving users in the revision;</li> <li>- disseminating updates.</li> </ul>  |   | OGP M2 Appendix V Table V.5         |
| <b>1.5.5 Management of Change</b>                        |  |   |                                     |
| Procedures   | A change and exemption procedure shall be in place and periodically reviewed, for planning and controlling temporary and permanent changes including changes in: <ul style="list-style-type: none"> <li>- crew organisation and key personnel;</li> <li>- operational methods and equipment;</li> <li>- crew procedures;</li> </ul> The procedure should designate authorisation levels for approving changes.                                       |   | OGP M1 Sections 5.4 and S5.4        |
| Hazard Assessment  | Explicit review and documentation of HSE hazards resulting from change.  |   | OGP M1 Sections 5.4 and S5.4        |
| <b>1.5.6 Contingency and Emergency Planning</b>          |  |   |                                     |
| Development of Emergency Plans and Procedures            | Contractor and Company shall both develop, document, and maintain plans for responding to potential emergencies, which should cover but not limited to: <ul style="list-style-type: none"> <li>- procedures;</li> <li>- organisation;</li> <li>- responsibilities including supporting contractors, liaisons and authority representatives;</li> <li>- authority.</li> </ul>   |   |                                     |
| Communication facilities and procedures                  | Each work unit (e.g. line cutting crew, drilling crew), fly camps, vehicles, small boats and support vessels in use shall have an effective means of communications with the main centre of operations (base camps / main vessel / barge).<br>Communication centres should maintain a log of crew movements and status.<br>Vessels and remote operations shall have 24 hour per day recourse to assistance from a shore / town support organisation. |   | IAGC S5 3.11.1                      |

| 1.5 Planning and Procedures                     | Minimum expectation for the implementation of an HSE MS  | Remark, alternative or exception | Reference(s) to requirements   |
|---|--|----------------------------------|--|
| Procedures for major emergency scenarios        | <p>An overall Emergency Plan shall be developed covering all major emergency scenarios, listing procedures to be followed and resources to be available in the case of emergency within each scenario, to include:</p> <ul style="list-style-type: none"> <li>- fire for facility / vessel /camp;</li> <li>- abandon ship;</li> <li>- adverse weather;</li> <li>- fuel/chemical spill;</li> <li>- aircraft incident;</li> <li>- medevac;</li> <li>- fatality;</li> <li>- in-water emergency;</li> <li>- rescue or work boat emergency recovery;</li> <li>- man overboard;</li> <li>- man lost / search and rescue operation (SAR);</li> <li>- vehicles;</li> <li>- evacuation;</li> <li>- security: <ul style="list-style-type: none"> <li>- interference from activist groups;</li> <li>- civil disturbances;</li> <li>- criminal and piracy activity.</li> </ul> </li> </ul> |                                  | <p>OGP M1 Sections 5.5 and S5.5<br/>OGP M2 Appendix V Table V.5</p> <p>IAGC S5 3.7</p> <p>IAGC S6 5.5</p> <p>IAGC S6 5.6</p> <p>OGP S4 Appendix 10</p> <p>OGP M7, OGP M8</p> |
| Competence and training for Emergency Response: | <p>All crew members shall be clearly briefed on their roles and responsibilities in emergency situations, and shall have received appropriate training to fulfil their tasks in developing emergency plans and during emergency situations:</p> <ul style="list-style-type: none"> <li>- Vessel Masters, Party Chiefs, Ops Mgrs;</li> <li>- Fire teams Land operations;</li> <li>- Fire teams Marine operations;</li> <li>- Fire teams Helicopter operations.</li> </ul>   |                                  | <p>OGP M3 MM3, MAM6, FMM7, FMM18</p> <p>OGP M3 OSM26, 27</p> <p>OGP M3 OSM26, 28, 29</p>   |
| Emergency systems for fires onshore.            | <p>System to detect and protect from fires onshore shall be inline with reference and the following:</p> <ul style="list-style-type: none"> <li>- 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 shall have fire fighting capabilities which include: fire water, pumps, hoses and a trained fire team with PPE;</li> <li>- fire / smoke detection devices should be installed in the accommodation, and adjacent areas.</li> </ul>  |                                  | IAGC S5 2.19   |
| Emergency systems for fires on vessels.         | <p>System to detect and protect from fires on vessels shall be inline with reference and the following:</p> <p>The preferred type of fixed fire protection system is the self monitoring type.</p> <p>Fixed firefighting systems shall be installed in the following areas:</p> <ul style="list-style-type: none"> <li>- over streamer reels,</li> <li>- streamer storage areas,</li> <li>- paint, batteries storage areas;</li> <li>- instrument and tape store rooms.</li> </ul>   |                                  | SOLAS Ch II-2 A, C<br>IAGC S6 5.20   |

| <b>1.5 Planning and Procedures</b> | <b>Minimum expectation for the implementation of an HSE MS</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>                     |
|------------------------------------|--|---|---|
| Abandon ship                       | Abandon ship, in water emergency and MOB: compliance with reference:   |   | SOLAS Ch III  |
| Medical emergency response times   | Medical emergency plans (Medevac) should meet the following response times: <ul style="list-style-type: none"> <li>- 4 min - life saving first aid;</li> <li>- 20 min - fully trained &amp; certified first aider;</li> <li>- 60 minutes - Paramedic, site doctor;</li> <li>- 4 hours - specialist/hospital doctor.</li> </ul>   |   | Refer to 2.1.2 Medical Resources (facilities and staff) |
| Swim test                          | All personnel working in water borne operations or near bodies of water shall be swim tested under adequate supervision and with medical recovery measures in place.   |   | IAGC S5 2.12<br>IAGC S6 2.8                             |
| Survival training                  | All persons including personnel assigned on behalf of Company shall receive the relevant survival training before beginning work in the field. <ul style="list-style-type: none"> <li>- for offshore / sea survival this shall be a recognised offshore training course;</li> <li>- for land operations this shall be an appropriate formal course of training relevant to the environment and type of operation.</li> </ul>   |   | OGP M3 OSM 35   |
|                                    | HUET training is required for personnel flying on helicopters over bodies of water.  |   | OGP M3 OSM 12   |
| Emergency Drills                   | All emergency procedures relevant to the operation shall be practised on a regular basis when the conditions do not pose a hazard to the safety of the crew, and: <ul style="list-style-type: none"> <li>- all drills shall have clearly defined scope and scale;</li> <li>- drills shall be followed by a proper debrief;</li> <li>- response times shall be monitored and where relevant, trended against pre-defined performance targets;</li> <li>- the frequency of drills shall be reviewed regularly;</li> <li>- drills shall occasionally be carried out without warning.</li> </ul> |   | IAGC S6 5.3   |

| <b>1.6 Implementation and Performance Monitoring</b>  | <b>Minimum expectation for the implementation of an HSE MS</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>  |
|---|---|---|--|
| <b>1.6.1 HSE equipment and inspection</b>   | An inventory of all HSE equipment shall be developed and maintained.  |   | OGP M1 5.2<br>IAGC S5 2.10, 2.11, 2.3, 2.19, 2.20<br>OGP M2 Appendix V Table V.5     |
|   | HSE equipment is subject to a regular inspection schedule.  |   | OGP M2 App V Table V.5   |
| <b>1.6.2 HSE Performance Monitoring</b>   |   |   |  |
| Realistic and challenging, reactive and proactive HSE targets set at both corporate and crew level. | Documented corporate, country, and crew HSE targets shall be in place: <ul style="list-style-type: none"> <li>- targets to be specific, measurable and attainable;</li> <li>- documented definitions of metrics used for measuring performance to be available.</li> </ul>  |   | OGP M1 S5.1 – S5.6<br><br>OGP M2 Appendix V, Table V.6.                              |
| Crew ownership of and commitment to HSE targets.  | HSE targets are determined by those directly involved in their achievement whenever possible and endorsed by Management.  |   | OGP M1 S4.4  |
| Monitoring and reporting of corporate and crew HSE performance.                                     | Regular HSE performance reporting shall be implemented: <ul style="list-style-type: none"> <li>- performance is tracked against the set targets;</li> <li>- corrective actions are developed for under-performance;</li> <li>- accurate records of HSE data shall be maintained.</li> </ul>   |   | OGP M1 6.2-6.5,<br>OGP M1 S5.2-S5.5.<br>OGP M2 Appendix V, Table V.6.<br>OGP M3 FMM2 |
| <b>1.6.3 Incident Investigation</b>   |   |   |  |
| The investigation and reporting team.   | A procedure shall be in place to determine the requirements and composition of the investigation team: <ul style="list-style-type: none"> <li>- based on the seriousness of the incident (actual or potential);</li> <li>- in the case of a fatality or an incident which significantly affects the environment or the Company / Contractor reputation, a senior manager shall lead the investigation team;</li> </ul>  |   | OGP M1 Sections 6.6 and S5.6.<br>OGP M2 Appendix V, Table V.6                        |
| Actions to be taken immediately after an incident.  | Gather information before it is lost: <ul style="list-style-type: none"> <li>- Identify witnesses and obtain statements;</li> <li>- take pictures and / or sketches / measurements of evidence that may be destroyed by weather, or may need to be moved;</li> <li>- perform drug / alcohol tests where appropriate;</li> <li>- isolate parts, tools or equipment involved in the incident;</li> <li>- isolate the incident scene where possible;</li> <li>- check gear, switch positions, fluid levels, safety devices of any equipment involved in the incident.</li> </ul> |   | OGP M3 MAM1<br>OGP M1 Sections 6.6 and S5.6.<br>OGP M2 Appendix V, Table V.6         |



| <b>1.6 Implementation and Performance Monitoring</b>                  | <b>Minimum expectation for the implementation of an HSE MS</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|---|---|---|-------------------------------------|
| Actions to be taken by the investigating team once assembled on site. | Incident investigation procedure should include the following: <ul style="list-style-type: none"> <li>- allocate individual responsibilities to team members;</li> <li>- gather information through witness statements, witness interviews, police or other authorities' reports, expert advice, paper records, (maintenance, procedures, previous incidents, training, JSA's);</li> <li>- examine parts, equipment, tools;</li> <li>- analyse photographs, sketches, measurements, re-visit incident scene;</li> <li>- develop a sequence of events;</li> <li>- determine and prioritise the contributing factors;</li> <li>- determine and list corrective actions and / or recommendations with named action parties and defined target dates;</li> <li>- name action party and target date for follow up on entire set of corrective actions and / or recommendations.</li> </ul> |   | OGP M1 Sections 6.6 and S5.6        |
| Lateral learning from incidents                                       | A procedure should be in place to describe the process of lateral learning from incidents which should include: <ul style="list-style-type: none"> <li>- immediately send out accident brief if problem could re-occur in other location;</li> <li>- compile incident report to include all corrective actions and / or recommendations;</li> <li>- circulate incident report as appropriate;</li> <li>- present findings to crew and management where appropriate.</li> </ul>  |   |                                     |
| Follow up of incidents  | A focal point should be assigned to ensure all corrective actions and / or recommendations addressed and closed out.  |   | OGP M1 Sections 6.6 and S5.6.       |

| <b>1.7 HSE Auditing and Reviewing</b>                 | <b>Minimum expectation for the implementation of an HSE MS</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements OGP M4 OCP M2 Appendix V, Table V.7</b> |
|---|---|---|---|
| Audit Plan  | The Contractor shall have an internal HSE audit plan that covers the entire scope of their geophysical operation including those managed by subcontractors in line with the reference.  |   | OGP M4  |
| Audit Scope   | The audit scope should clearly state: <ul style="list-style-type: none"> <li>- standards;</li> <li>- rules;</li> <li>- regulations;</li> <li>- work instructions/procedures/guidelines;</li> <li>- the audit criteria against which the audit findings will be assessed.</li> </ul>   |   |   |
| Audit Team  | Competence of the audit team: <ul style="list-style-type: none"> <li>- familiar with audit techniques, the audit leader should have previous experience in leading audits;</li> <li>- the audit team should be composed to possess an appropriate combination of knowledge, skills, personal qualities and experience to carry out their responsibilities to fulfil the scope of the audit.</li> </ul>  |   | OGP M3 MAM2   |
|   | Independence: <ul style="list-style-type: none"> <li>- the team should be objective and free from conflict of interest, although it may include representative(s) from the activity to be audited.</li> </ul>   |   |   |
| Audit Process   | The audit process should comply with the reference.   |   |   |
| Close-out and remedial actions                        | The final audit report and remedial actions should be delivered in a timely fashion.<br>The auditee is responsible for corrective action plans and status reports.  |   |   |
| Self audits / inspections                             | The site shall have a regular schedule of self-audits and inspections.  |   |   |
| Management review of Contractor HSE management system | Contractor management shall review their HSE management system at regular intervals (at least annually) to ensure its continuing suitability and effectiveness with regards to their activities and crews, and the review shall: <ul style="list-style-type: none"> <li>- assess corporate HSE performance;</li> <li>- address possible needs for changes in policy, objectives or other system elements in light of audit results and changing circumstances and commitment to continual improvement.</li> </ul> |   |   |
| Final evaluation and close out                        | Company and Contractor management shall meet to review the performance of the project addressing: <ul style="list-style-type: none"> <li>- HSE evaluation;</li> <li>- HSE performance report;</li> <li>- lateral learning and recommendations for future projects.</li> </ul>   |   | OGP M2 Sec 10   |

## TABLE 2: Minimum Expectations for the Control of Specific Risk Areas

| <b>2.1 Occupational Health and Medical Care</b>  | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>  |
|--|---|---|--------------------------------------|
| <b>2.1.1 Health Risk Assessment (HRA)</b>  | A documented HRA relevant to the operation and job tasks on the crew shall be available, which shall include the following risks and those in 2.1.3 and 2.1.4.  |   | OGP H1                               |
| <ul style="list-style-type: none"> <li>- Prevalence patterns of local disease:</li> <li>- local health and work related health risks</li> <li>- bacteria</li> <li>- blood borne pathogens</li> </ul> | <ul style="list-style-type: none"> <li>- Surveillance programmes in place:</li> <li>- awareness and education programmes in place.</li> <li>- immunisation &amp; chemoprophylaxis programmes based on HRA</li> </ul>  |   |                                      |
| Environmental health risks the area of operation.  | 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.   |   |                                      |
| <b>2.1.2 Medical Resources (facilities and staff)</b>  |   |   |                                      |
| Facilities, medical equipment and essential drugs and medicines.   | <p>The standards of medical facilities to be provided for stabilising care &amp; trauma injuries must be professionally reviewed and be based on the recommendations of the reference and on the HRA performed in 2.1.1 for the following (where relevant):</p> <ul style="list-style-type: none"> <li>- Land base camps;</li> <li>- Land fly camps;</li> <li>- ambulances (vehicle and boat);</li> <li>- Land / TZ line crew medic kits;</li> <li>- marine seismic vessel;</li> <li>- support vessels operating close to main crew / vessel;</li> <li>- shallow water / TZ mother vessel/barge.</li> </ul> |   | OGP H3 section 2, Appendices 2 and 5 |
| Trained health personnel   | <p>Compliance with the reference addressing where relevant the following:</p> <ul style="list-style-type: none"> <li>- Land base camps;</li> <li>- land fly camps;</li> <li>- marine seismic vessel;</li> <li>- support vessels close to main crew;</li> <li>- shallow water / TZ mother vessel/barge.</li> </ul>   |   | OGP H1                               |
| Evaluation of local external medical facilities and resources.   | <p>A documented assessment shall be performed on the standards of local medical facilities and resources covering but not limited to:</p> <ul style="list-style-type: none"> <li>- competence and experience of medical and supporting personnel;</li> <li>- range and quality of equipment and supplies;</li> <li>- hygiene standards;</li> <li>- administration procedures and standards;</li> <li>- transportation and communication.</li> </ul>   |   |                                      |

| <b>2.1 Occupational Health and Medical Care</b>                            | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>                             |
|--|--|---|---|
| <b>2.1.3 Health and hygiene standards for camps and other living areas</b> |  |   |   |
| Accommodation facilities   | <p>The crew accommodation shall be designed, constructed and maintained to meet the following criteria:</p> <ul style="list-style-type: none"> <li>- adequate protection against moisture and wind, and extreme temperatures;</li> <li>- designed to prevent ingress of insects and pests;</li> <li>- provide adequate lighting/ventilation and temperature control;</li> <li>- separate bed for each person with free floor access between beds;</li> <li>- adequate laundry facilities.</li> </ul>   |   |   |
| Domestic animals   | It shall be prohibited to keep dogs, cats and other animals on the crew and in camps.  |   |   |
| Toilet and sanitary facilities in base and fly camps                       | <p>The crew toilet and sanitary facilities shall be designed, constructed and maintained to meet the following criteria:</p> <ul style="list-style-type: none"> <li>- washable floor for base camp facilities (not required for temporary fly camps);</li> <li>- 1 toilet, wash hand basin and shower per 15 employees;</li> <li>- adequate supply of water and adequate drainage;</li> <li>- hot and cold water to wash basins and showers in base camps;</li> <li>- adequate soap to be supplied to all communal sanitary conveniences.</li> </ul> |   |   |
| Sewage, grey water disposal  | Compliance with guidelines, requirements and practices in the reference document   |   | IAGC E6   |
| Cleaning and Housekeeping  | <p>Procedures shall be established for camp</p> <ul style="list-style-type: none"> <li>- cleaning which include:</li> <li>- cleaning schedules and their scope;</li> <li>- monitoring and inspections programmes.</li> </ul>   |   | IAGC S5 8.1.2   |
| Water supplies   | <p>Sufficient potable water per person per day from acceptable sources shall be provided and maintained for all personnel at all locations:</p> <ul style="list-style-type: none"> <li>- drinking water standards shall adhere with WHO Guidelines for Drinking Water Quality;</li> <li>- regular testing at several points of use. (for both chemical and bacteriological)</li> </ul>   |   | IAGC S5 8.1.3<br><br>WHO Guidelines for Drinking Water Quality; |
| Kitchen /galley facilities   | The crew kitchen /galley facilities are designed, constructed and maintained to comply with the guidelines in the reference.   |   | IAGC S5 8.1.2   |
| Eating places and provision of meals                                       | <p>The crew meal provision service is designed, constructed and maintained to meet the following criteria:</p> <ul style="list-style-type: none"> <li>- 50% of persons sleeping in a camp in one sitting;</li> <li>- at least two meals per day one being hot.</li> </ul>  |   |   |

| <b>2.1 Occupational Health and Medical Care</b>  | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>          |
|--|---|---|--|
| Food handlers  | The crew food handlers shall have:<br>- medical examinations (may be subject to local regulations);<br>- valid medical certificates;  |   | IAGC S5 8.1.8<br>IAGC S6 4.11<br>OGP H4 3.23 |
|  | - received food handling training;  |   | OGP 3 OSM 33                                 |
|  | - PPE catering clothing issued and worn.  |   | IAGC S5 8.1.8 item 4<br>IAGC S6 4.11 item 5  |
| Food supplies and storage  | The food provided should meet the following criteria:<br>- quantity and quality is adequate;<br>- is in date (shelf life adequate);<br>- the delivery temperatures are adequate;<br>- a food segregation system is in place;<br>- a monitoring system is in place for frozen and other food storage temperatures. |   | IAGC S5 8.1.5,<br>8.1.6,<br>8.1.7            |
| Food preparation, cooking  | During food preparation, a food segregation system is in place.   |   | IAGC S5 8.1.10,<br>8.1.11                    |
| <b>2.1.4 Work environment and hazardous materials</b>                                    | The controls recommended by the HRA relating to hazardous materials and other agents shall be in place and the following specific risk areas shall be addressed when identified in the HRA:   |   |  |
| Carcinogens and other toxic materials (benzene, chemicals, paints, oils, diesel exhaust) | The crew supervisors shall have awareness and knowledge in the management of hazardous materials<br>Material Safety Data Sheets (MSDS) shall be in place covering:<br>- accurate and current inventory of all products requiring MSDS;<br>- labelling;<br>- work practices;<br>- separate storage;<br>- PPE.      |   | OGP M3 FMM15<br>IAGC S5 3.16 and<br>S6 3.9   |
| H2S (oil installations and sewage plants)  | If there is a risk of exposure to H2S, the controls recommended by the reference shall be in place, these include:<br>- H <sub>2</sub> S certified training provided;<br>- Portable H <sub>2</sub> S alarms;<br>- PPE as required.  |   | IAGC S5 3.16.2                               |
| Dusts (desert dust, abrasive materials, asbestos)  | Information and induction briefings shall be provided as well as the appropriate PPE.   |   |  |
| Noise  | The following shall be available on the crew to manage noise risks:<br>- information on the noise generated by equipment;<br>- assessment by noise surveys;<br>- a noise meter;<br>- information and signing ;<br>- PPE (hearing protection) and PPE wearing rules.   |   | ISO 2923                                     |
| Cold climates (heat loss)  | Procedures shall be place for working in the cold including the provision of winter PPE.  |   | OGP H6<br>IAGC S5 2.16,<br>3.17              |
| Hot climates (heat stress)   | Procedures shall be place for working in hot climates.  |   | OGP H7<br>IAGC S5 2.5                        |

| <b>2.1 Occupational Health and Medical Care</b> | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>             |
|---|---|---|---|
| Ergonomics                                      | <p>The HRA conducted in 4.1.1 shall include the relevant ergonomic aspects, including but not limited to:</p> <ul style="list-style-type: none"> <li>- assessment of VDUs / instrument room ergonomic design and layout;</li> <li>- assessment of musculo-skeletal strain (lifting, working in difficult terrain) to include: <ul style="list-style-type: none"> <li>- provision of lifting and handling training;</li> <li>- provision of lifting and handling aids.</li> </ul> </li> </ul>    |   | IAGC S5 2.6<br>IAGC S6 2.4<br>OGP M3 OSM30      |
| Working hours and working schedules             | <p>Crew working hours and working schedules will meet the following:</p> <ul style="list-style-type: none"> <li>- compliance with the relevant regulations;</li> <li>- a maximum of 12 hours per day for jobs with significant manual work (line crews, drilling);</li> <li>- a maximum 15 hours per day for crew supervisors and others;</li> <li>- adequate care and planning given to the provision of rest, with a maximum shift length of 26 weeks.</li> </ul>                             |   |   |
| <b>2.1.5 Medical checks and records</b>         |   |   |   |
| Medical fitness checks                          | <p>Medical fitness checks shall cover the following aspects but not limited to:</p> <ul style="list-style-type: none"> <li>- the pre-employment fitness standards;</li> <li>- pre-employment medical to confirm fitness for the work and tasks assigned;</li> <li>- pre-employment drug &amp; alcohol testing for HSE critical positions;</li> <li>- periodic medical checks during employment.</li> </ul>  |   | OGP H4<br>OGP H2                                |
| Medical records                                 | <p>Medical records shall maintained and copies of the relevant records should be kept on the crew, these should include:</p> <ul style="list-style-type: none"> <li>- confidential records on consultations.</li> <li>- medical examination records for all staff.</li> <li>- statistics and reporting of occupational illnesses and other illnesses of interest based on local HRA (e.g. malaria in non-immune and immune workers);</li> <li>- inventory of medicines and supplies.</li> </ul> |   |   |
| <b>2.1.6 Life style and health promotion</b>    |   |   |   |
| Smoking   | <p>A written smoking policy shall be available, disseminated on the crew and be strictly enforced.</p>  |   |   |
| Substance abuse                                 | <p>A substance abuse policy shall be available, disseminated on the crew and be strictly enforced.<br/>Compliance with the relevant legislation and guideline.</p>  |   | OGP H2<br>IAGC S5 2.3 and S6 2.3<br>OGP M3 MAM5 |

| <b>2.1 Occupational Health and Medical Care</b>                 | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|---|--|---|-------------------------------------|
| Recreational and welfare facilities                             | Recreational and welfare facilities should be provided for camps and vessels, which should include: <ul style="list-style-type: none"> <li>- telephone facilities;</li> <li>- television, video and films;</li> <li>- exercise and sporting facilities;</li> <li>- religious facilities if appropriate.</li> </ul> |   |                                     |
| Promotion material available to assist in maintaining standards | An health promotion programme shall be in place, which is appropriate to the level of risk (malaria, smoking, stress, diet, exercise, HIV etc.).   |   |                                     |

| <b>2.2 Environment</b>                    | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|---|---|---|-------------------------------------|
| <b>2.2.1 Planning</b>                     |   |   |                                     |
| Crew Environmental Management Plan (EMP). | Contractor shall develop environmental objectives, targets and implement an Environmental Management Plan (EMP) to meet relevant legal and regulator requirements and for those other environmental aspects considered to be significant to the operation:  |   | OGP E1, E2, E3, E4<br><br>IAGC E6   |
|   | - Contractor and crew management should have an environmental management competence profile in-line with the reference.   |   | OGP M3 FMM3<br>OGP M3 FMM4          |
|   | - recommendations of relevant EIAs shall be taken into account when developing the crew EMP;<br>- the controls shall 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 normal, abnormal and emergency situations.<br>- the controls (mitigation measures) will as a minimum be in compliance with relevant sections of the IAGC E6.  |   |                                     |
| <b>2.2.2 Waste Management</b>             |   |   |                                     |
| Specific Waste Management Plan (WMP)      | The Contractor shall develop a specific Waste Management Plan (WMP) as part of the EMP for the crew, which shall be implemented at crew level in accordance and in compliance with the relevant sections of: <ul style="list-style-type: none"> <li>- the E&amp;P waste management guidelines;</li> <li>- to meet regulatory requirements including MARPOL;</li> <li>- to meet the relevant controls identified by the Relevant EAs and any relevant environmentally significant aspects which have been identified by Company and Contractor.</li> </ul> |   | OGP E5<br>MARPOL Annex IV           |

| <b>2.2 Environment</b>  | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|---|--|---|-------------------------------------|
| Non-hazardous waste from geophysical activities   | WMP to include wastes from offices, operational, residential and camp locations etc.):<br><ul style="list-style-type: none"> <li>- industrial waste (wooden pallets, plastic, cap wire, survey pegs, camp construction waste, scrap metal, etc.);</li> <li>- domestic waste (kitchen waste grey water;</li> <li>- office waste (used stationary, plastics, printer and tone cartridges, tapes and disks).</li> </ul> |   | IAGC E6                             |
| Hazardous waste from geophysical activities   | WMP to include:<br><ul style="list-style-type: none"> <li>- medical waste;</li> <li>- oily waste (spent lube oils, etc.);</li> <li>- chemical waste (batteries, obsolete chemicals shot/uphole drilling mud etc.);</li> <li>- black water and sewage sludge which shall not be disposed of untreated into surface water courses.</li> </ul>  |   | IAGC E6                             |
| Stakeholder mapping including the interaction of seismic operations with third parties) | Identify, 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:  |   | IAGC E6                             |
|   | - competence management (Company, Contractor and crew) to handle media and public relations.   |   | OGP M3 MAM6                         |
|   | - interaction with fishing vessels and general shipping;<br>- interaction with other oil and gas related operations;<br>- interaction with the general public;<br>- interaction on public highways;<br>- interaction with farmers and /or their animals.   |   | IAGC E6                             |

| <b>2.3 Land Transport</b>      | <b>Minimum expectation of the controls</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|--------------------------------|--|---|-------------------------------------|
| <b>2.3.1 Vehicle resources</b> |  |   |                                     |
| Type, selection and design     | Assessment and inventory to cover:<br><ul style="list-style-type: none"> <li>- type, number of units, allocation of units;</li> <li>- diesel powered when possible;</li> <li>- load limits defined and marked;</li> <li>- speed limits on and off road defined and clearly marked;</li> <li>- recommended tyre pressures clearly marked;</li> <li>- segregation, positioning and securing of freight;</li> <li>- to be used off road yes/no;</li> <li>- for carrying passengers yes/no, (max capacity clearly marked;</li> <li>- passenger seating arrangement.</li> </ul> |   | IAGC S5<br>OGP S4 App.1             |



| 2.3 Land Transport  | Minimum expectation of the controls   | Remark, alternative or exception   | Reference(s) to requirements                      |
|---|---|--|---|
| <b>2.3.2 Vehicle safety equipment</b>                                     |   |  |   |
| Seat belts and other recovery measures in vehicles (including crew buses) | Compliance with guidelines, requirements and practices in the reference documents.  |  | IAGC S5 6.1 item 13 and 6.5                       |
| In vehicle monitoring system (IVMS)                                       | Vehicles shall be equipped with IVMS (VDR), which include but not limited to : <ul style="list-style-type: none"> <li>- speed distribution;</li> <li>- vehicle and driver identification;</li> <li>- number of km driven;</li> <li>- management system to collect, analyse and report the data to management and drivers.</li> </ul>  |  |   |
| Vehicle tracking system   | A vehicle tracking system (VTS) should be fitted to vehicles operating in high risk environments. which includes but not limited to <ul style="list-style-type: none"> <li>- a VTS central system / operator to monitor and control crew vehicle journeys in real time.</li> </ul>  | Optional:<br>Company must explicitly request this enhanced land transport control measure. |   |
| <b>2.3.3 Vehicle maintenance</b>  |   |  |   |
| Vehicle maintenance   | Maintenance programme tied to hours/km on vehicle shall be in place including: <ul style="list-style-type: none"> <li>- vehicle log book/records;</li> <li>- daily inspection (signed off) by drivers;</li> <li>- defect reporting system;</li> <li>- regular inspection by mechanic.</li> </ul>  |  | IAGC S5 6.1 item 6<br><br>OGP S4 App. 8           |
| <b>2.3.4 Vehicle drivers</b>  |   |  |   |
| Drivers competence and selection  | Drivers competence shall be assessed and documented including their: <ul style="list-style-type: none"> <li>- physical, (medical examination including a vision test), mental and psychological capability;</li> <li>- character and background;</li> <li>- qualities and experience;</li> <li>- document checks, driving tests, (theory and hands on);</li> <li>- special skills such as terrain and climatic experience.</li> </ul> |  | OGP S4 App. 2                                     |
| Driving Permits and records   | Driver records shall be maintained, including: <ul style="list-style-type: none"> <li>- personal and employment details;</li> <li>- types of vehicle licensed to drive;</li> <li>- operating conditions (terrain) approved to drive;</li> <li>- types of cargo licensed to carry.</li> </ul>  |  | IAGC S5 6.1<br>OGP S4 App. 2                      |
| Driver induction and training   | Driver training is inline with the referenced modules.  |  | OGP M3<br>OSM1, OSM2<br>OSM3                      |
| Driver performance monitoring and improvement                             | Drivers are periodically re-assessed to identify deficiencies, analyse causes and select appropriate retraining including: <ul style="list-style-type: none"> <li>- review of IVMS and VTS data with drivers and crew management;</li> <li>- driving performance monitoring records are maintained.</li> </ul>  |  | OGP M3<br>OSM1, OSM2<br>OSM3<br>OGP S4 Appendix 3 |

| <b>2.3 Land Transport</b>  | <b>Minimum expectation of the controls</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|--|---|---|-------------------------------------|
| <b>2.3.5 Third Parties and Local Communities</b>                       |   |   |                                     |
| Third party awareness of crew vehicle traffic risks                    | Briefing should be made to relevant third parties and local communities on land transport safety.   |   |                                     |
| <b>2.3.6 Vehicle operations / procedures</b>                           |   |   |                                     |
| Journey management procedures  | Compliance with guidelines, requirements and practices in the reference document including a documented procedure covering: <ul style="list-style-type: none"> <li>- driving after dark (not normally permitted except in urban areas or in close support of night time vibroseis operations);</li> <li>- off-road driving;</li> <li>- journey reporting;</li> <li>- breakdown rules;</li> <li>- convoy rules;</li> <li>- documented limit to number of driving hours permitted in 24 hrs.</li> </ul> |   | OGP S4 Appendix 9<br>IAGC S5 6.2    |
| Additional requirements for different types of vehicles and operations | Compliance with guidelines, requirements and practices in the reference document for:   |   |                                     |
|  | - all Terrain Vehicles, (ATV's);  |   | IAGC S5 6.8                         |
|  | - snowmobiles;  |   | IAGC S5 6.9                         |
|  | - truck mounted Vibrators.  |   | IAGC S5 5.2.1                       |

| <b>2.4 Water Transport</b>               | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b>   | <b>Reference(s) to requirements</b> |
|--|--|---|-------------------------------------|
| <b>2.4.1 Small boat resources</b>        |  |   |                                     |
| Design considerations                    | The design of small boats used for seismic operations shall be in accordance with the relevant sections in the reference.  |   | IAGC/OGP S2                         |
| Inventory                                | An inventory of all small boats on the crew shall be maintained and shall as a minimum include: <ul style="list-style-type: none"> <li>- type, size and capacity;</li> <li>- built-in buoyancy characteristics;</li> <li>- load limits;</li> </ul> maximum passenger capacity. |   |                                     |
| <b>2.4.2 Small boat safety equipment</b> |  |   |                                     |
| General safety equipment                 | All small boats shall as a minimum comply with the equipment guideline in the reference document.  |   | IAGC S5 7.1                         |
| Vessel tracking system                   | A tracking system should be fitted to all small boats operating in high risk environments, including but not limited to: <ul style="list-style-type: none"> <li>a VTS central system/ operator to monitor and control crew vehicle journeys in real time.</li> </ul>           | Optional:<br>Company must explicitly request this enhanced transport control measure. |                                     |
| <b>2.4.3 Small boat maintenance</b>      |  |   |                                     |
| Small boat maintenance                   | Small boat maintenance shall be carried out in accordance with the reference.  |   | IAGC/OGP S2                         |
| <b>2.4.4 Small boat drivers and crew</b> |  |   |                                     |
| Drivers competence                       | All small boat drivers shall be deemed competent for the type of craft they are driving in accordance with the reference.<br>Their competence shall be periodically re-assessed.   |   | OGP M3 OSM7, OSM8,                  |
| Small boat crew competence               | All small boat crew shall comply with the training and competence requirements in the reference.   |   | IAGC/OGP S2                         |

| <b>2.4 Water Transport</b>                                    | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>                      |
|---|---|---|--|
| Driving permits and records                                   | Driver / coxswain records shall be maintained and shall include: <ul style="list-style-type: none"> <li>- personal and employment details</li> <li>- types of boats the coxswain is licensed to drive.</li> </ul>   |   |  |
| <b>2.4.5 Small boat operations / procedures</b>               |   |   |  |
| Journey management  | All small boat operations shall be carried out in accordance with a journey management system. The journey management system shall define conditions under which operations are approved (sea state, currents, wind, permitted driving hours, visibility, etc.).<br><br>Operating guidelines to be followed and precautions to be taken are described in the references.  |   | IAGC S5 6.2<br>IAGC S5 7.1<br>IAGC/OGP S2<br>IAGC/OGP S2 |
| Additional requirements for specific types of boat operations |   |   |  |
| Small boat operations (land)                                  | Small boat operations shall comply with local river transport laws and regulations.<br>Procedures shall be in place for controlling land specific hazards, e.g.: <ul style="list-style-type: none"> <li>- traffic;</li> <li>- predators;</li> <li>- debris;</li> <li>- low hanging limbs;</li> <li>- tides;</li> <li>- shallow water;</li> <li>- currents;</li> <li>- blind corners;</li> <li>- smaller craft being swamped.</li> </ul> |   |  |
| Small boat operations (Transition Zone)                       | Operations are in compliance with guidelines, requirements and practices in the reference document  |   | IAGC S5 7.3  |
| Airboat operations  | Operations are in compliance with guidelines, requirements and practices in the reference document as well as the following: <ul style="list-style-type: none"> <li>- all seats to be fitted with seat belts</li> <li>- safety shroud is fitted around the propeller;</li> <li>- procedures in place for controlling unique hazards, (back wash from propeller, large wake, slow to come to a stop)</li> </ul>                          |   | IAGC S5 7.2<br>OGP M3 OSM 9                              |

| <b>2.5 Marine seismic and support vessels</b>          | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>     |
|--|--|---|---|
| Vessel design and certification                        | The vessel shall be built and equipped to the requirements of a recognised International Classification Society and/or Government, and shall have valid certification issued by this Classification Society and/or Government for the type and area of operation.<br>All relevant certificates and ship documents should be available on the vessel. |   | Class Requirements                      |
| Manning / competence                                   | The vessel crew shall be certified for the vessel class, size, area and type of operation, The flag state's minimum manning requirements shall be fulfilled.   |   | Flag State Requirements<br>IMO STW      |
| Emergency equipment / Life saving appliances - General | The vessel(s) shall be appropriately equipped for its class with life saving appliances complying with, and in accordance with the references.<br>All emergency equipment onboard shall be maintained in a state of readiness at all times, including regular testing.<br>The relevant personnel onboard shall be trained in it's use                |   | Class Requirement,<br>SOLAS,<br>IMO STW |
| Life Rafts   | Whether or not lifeboats are fitted, life-rafts shall be provided with an aggregate capacity of at least 200% of the total number of berths on board.<br>The life-raft capacity on either side of the vessel shall be sufficient to accommodate the total number of berths on board.<br>All rafts are to be fitted with hydrostatic releases.        |   |   |
| Survival Craft   | Where applicable the preferred type of rigid hulled life boat(s) is the Totally Enclosed Motor Propelled Survival Craft (TEMPSC).  |   | SOLAS Ch III                            |
| Life Jackets   | Life jackets 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.<br>The life jackets' position and donning instructions shall be clearly displayed.  |   | SOLAS Ch III                            |
| Survival Suits (with insulation)                       | Where operational conditions demand their use, the vessel shall be equipped with survival suits of appropriate sizes for all persons on board.<br>The survival suits shall be readily accessible and their position and donning instructions shall be clearly displayed.   |   | SOLAS Ch III Reg 33                     |
| Smoke Hoods  | All cabins shall be equipped with smoke escape hoods for which donning instructions shall be clearly displayed.  |   |   |
| Man Overboard Life-raft                                | An emergency man overboard life raft shall be provided in the optimum position to clear trailing gear.   |   |   |

| <b>2.5 Marine seismic and support vessels</b> | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|---|---|---|-------------------------------------|
| Rescue Boat                                   | A rescue boat with nominated crew shall be readily available for immediate launching whilst survey operations are taking place:<br><ul style="list-style-type: none"> <li>- water jet propulsion is preferred;</li> <li>- rigid hull preferred;</li> <li>- diesel powered.</li> </ul>         |   | SOLAS Ch III Section V (Reg 38)     |
| Safety Harnesses                              | Safety harnesses approved to suitable International Standards shall be provided for personnel working in areas where there is a danger of them either falling or being dragged overboard.<br><br>The harnessed shall have suitably positioned and safe attachment points.                     |   |                                     |
| Fixed fire protection system                  | The preferred type of fixed fire protection system is the self monitoring type.   |   |                                     |
| Transfer of Personnel at Sea                  | Documented procedures shall be in place.<br>Personnel shall not be transferred to and from the vessel at sea unless agreed to do so by Contractor and Company. The consent of the persons transferring shall also be obtained. Such transfers shall comply with locally enforced regulations. |   |                                     |
| Loading/offloading                            | Documented procedures shall be in place for offloading / loading at main vessel or quayside, to include but not limited to:<br><ul style="list-style-type: none"> <li>- cargo;</li> <li>- fuel.</li> </ul>  |   |                                     |

| <b>2.6 Air Transport</b>                 | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|--|---|---|-------------------------------------|
| <b>2.6.1 Air operations / procedures</b> | The air operation(s) shall be in compliance with the relevant guidelines, requirements and practices in the reference document. |   | OGP S1                              |
| <b>2.6.2 Audit of air operations</b>     | A competent aviation expert shall conduct an independent audit at the start of operations (by Company or Contractor).           |   |                                     |

| <b>2.7 Camps and field workshops</b>       | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference: IAGC S5 8.0</b>                                      |
|--|--|---|--|
| <b>2.7.1 Electrical</b>                    | A competent person must be identified as responsible for all electrical aspects on the crew.<br><br>Compliance with guidelines, requirements and practices in the reference document.  |   | IAGC S5 8.1.1<br>IAGC S6 4.8<br>IEE 16th series or IEC 60364 (1-3) |
| <b>2.7.2 Camp sites and site selection</b> | Camp sites should be located with suitable regard to safe access, environmental impact, community impact, and general safety.<br><br>As far as possible, the camp site should be left in the same condition as it was found. |   | IAGC E6<br>IAGC S5 8.1.13  |

| <b>2.7 Camps and field workshops</b>                            | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference: IAGC S5 8.0</b>                               |
|---|--|---|---|
| <b>2.7.3 Ladders and scaffolds</b>                              | Compliance with guidelines, requirements and practices in the reference document: <ul style="list-style-type: none"> <li>- designed to support load;</li> <li>- non-conducting ladder for electrical work;</li> <li>- safety feet and rubber tips for extension and straight ladders;</li> <li>- step ladders not to be used as straight ladders;</li> <li>- PPE: tool belts or pouches.</li> </ul>  |   | IAGC S6 4.15<br>IAGC S5 8.2.2                               |
| <b>2.7.4 Welding, Burning, Cutting - General Safe Practices</b> | Compliance with guidelines, requirements and practices in the reference document.  |   | IAGC S6 4.14<br>IAGC S5 8.2.3                               |
| <b>2.7.5 High pressure Air, Water and hydraulic systems.</b>    | Procedures shall be in place, which include but not limited to the following controls: <ul style="list-style-type: none"> <li>- competent personnel;</li> <li>- designated area with warning signs;</li> <li>- fan belts and pulleys protected;</li> <li>- inspection/ maintenance programmes;</li> <li>- no unattended operation.</li> </ul>  |   | IAGC S6 3.1.1<br>IAGC S5 5.2.2                              |
| <b>2.7.6 Storage of Chemicals Oxidants and Acids</b>            | Procedures are in place which include the following controls: <ul style="list-style-type: none"> <li>- an inventory of all hazardous materials is maintained by the crew: relevant Manufacturers Safety Data Sheet (MSDS) to be available at the storage location, work location if appropriate, and at a location accessible to all crew;</li> <li>- stored according to MSDS;</li> <li>- isolated from offices, accommodations, and other work areas;</li> <li>- appropriate PPE available near storage;</li> <li>- eye wash station;</li> <li>- chemicals clearly labelled and stored in proper containers;</li> <li>- adequate ventilation;</li> <li>- fire extinguisher.</li> </ul> |   | IAGC S5 2.19, 3.16, 9.13<br>IAGC S6 3.9, 3.11<br>OGP M1 4.3 |
| <b>2.7.7 Battery Charging</b>                                   | Battery charging procedures shall be in place, which include the following controls: <ul style="list-style-type: none"> <li>- designated, separate area;</li> <li>- area well ventilated;</li> <li>- smoking prohibited;</li> <li>- appropriate PPE available;</li> <li>- training requirements.</li> </ul>  |   | IAGC S6 3.11<br>IAGC S5 2.19, 3.16.1                        |
| <b>2.7.8 Fuel Transfer or Storage</b>                           | Procedures shall be in place, which include the following controls: <ul style="list-style-type: none"> <li>- designated area(s);</li> <li>- separation of hazardous areas;</li> <li>- containment system(s);</li> <li>- high visibility warning signs;</li> <li>- appropriate fire fighting equipment positioned within 15m of pumps or dispensers</li> <li>- only approved fuel tankers to be used;</li> <li>- tankers adequately grounded during fuel transfers;</li> <li>- appropriate PPE;</li> <li>- designated and trained fuel clerk.</li> </ul>  |   | IAGC S5 2.19, 6.3, 9.3<br>IAGC S6 4.6, 6.8                  |

| <b>2.7 Camps and field workshops</b> | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference: IAGC S5 8.0</b>                   |
|--------------------------------------|--|---|---|
| <b>2.7.9 Fuelling operations</b>     | Procedures shall be place for fuel handing, including:<br><ul style="list-style-type: none"> <li>- fuel quality (control and testing);</li> <li>- fuel storage (including spill containment);</li> <li>- fuel transport;</li> <li>- refuelling.</li> </ul> |   | IAGC S5 6.3, 9.3<br>IAGC S6 4.6, 6.8            |
| <b>2.7.10 Compressed gases</b>       | Procedures shall be place for compressed gases, including:<br><ul style="list-style-type: none"> <li>- segregation;</li> <li>- safe distances;</li> <li>- hydrostatic testing;</li> <li>- labelling;</li> <li>- storage;</li> <li>- handing.</li> </ul>    |   | IAGC S5 2.19.3, 8.2.3<br>IAGC S6 4.14.1, 4.14.2 |

| <b>2.8 Security (land and marine)</b>   | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|---|---|---|-------------------------------------|
| Assessment  | Before the survey start-up, the security of the operation shall be assessed or re-assessed in the event of changing conditions.   |   |                                     |
| Procedures  | Security procedures shall be in place covering a range of situations including:<br><ul style="list-style-type: none"> <li>- assault;</li> <li>- robbery / theft;</li> <li>- abduction / Missing persons;</li> <li>- vandalism / sabotage;</li> <li>- war / terrorism / piracy;</li> <li>- civil disobedience / strikes.</li> </ul>  |   | IMO Piracy                          |
| Personal awareness  | Personnel involved in the operation to be trained in basic preventive measures to reduce potential security incidents.  |   |                                     |
| Potentially aggressive interference or intervention of third parties with the seismic operation | 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 Company and Contractor procedures. Events to be addressed might include:<br><ul style="list-style-type: none"> <li>- interference with vessels /vehicles/ equipment by a third party;</li> <li>- radio contact from a suspicious third party;</li> <li>- third party puts themselves or crew members in danger;</li> <li>- third party shows aggression towards the crew;</li> <li>- third party attempts to take possession of crew property.</li> </ul> |   | OGP M7<br>OGP M8                    |

| <b>2.9 Natural hazards</b>             |   |  |   |
|--|---|--|---|
| Weather and terrain<br>Fauna and flora | <p>The relevant natural hazards shall be identified and assessed and effective control and recovery measures shall be place, including where relevant:</p> <ul style="list-style-type: none"> <li>- which activities will be permitted in adverse weather;</li> <li>- weather (sun, ice, snow, rain, fog, lightning, hail, wind, heat, cold);</li> <li>- weather secondary effects (floods, landslides, sandstorm, static electricity);</li> <li>- geological (volcanoes, earthquakes, water tsunamis, radon, methane, H2S, cave-ins, quicksand);</li> <li>- avalanche (snow, ice, rock);</li> <li>- tides and currents (river bores, coastal effects);</li> <li>- fauna (venomous, poisonous, aggressive);</li> <li>- flora (poisonous, penetrating[sharp], barrier).</li> </ul> |  | <p>IAGC S5 2.7</p> <p>IAGC S5 2.16,<br/>IAGC S5 3.15,<br/>IAGC S5 3.17<br/>OGP H6<br/>OGP H7</p> <p>IAGC S6 2.6</p> |

| <b>2.10 Shot hole drilling</b>                               | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|--|--|---|-------------------------------------|
| Drill unit resources: type, selection and design.            | An assessment shall be available for the required drill unit, which should cover the lithology, terrain, required depth and ergonomics.  |   |                                     |
| Safety equipment for drill / ramming units                   | Compliance with guidelines, requirements and practices in the reference document.  |   | IAGC S5 4.1.3                       |
| Maintenance  | Compliance with guidelines, requirements and practices in the reference document.  |   | IAGC S5 4.1.2                       |
| Operators competence and selection                           | Perform an assessment inline with reference document of drilling operator experience, training on the specific unit(s) used.   |   | OGP M3<br>OSM20A OSM20B             |
| Heliportable drilling loadmasters                            | Heliportable drilling operators shall be trained as helicopter loadmasters.  |   | OGP M3<br>OSM11                     |
| Operational procedures for different types of drilling units | <p>Procedures shall be in place for the specific drill units being used , which are in compliance with guidelines, requirements and practices in the reference document:</p> <ul style="list-style-type: none"> <li>- truck mounted drills;</li> <li>- buggy mounted drills;</li> <li>- airboat mounted drills;</li> <li>- marsh buggy mounted drills;</li> <li>- ramming rigs;</li> <li>- heliportable drills.</li> </ul> |   | IAGC S5 4.1.1,<br>4.1.4, 4.2        |
| Clean up / Move up   | Compliance with guidelines, requirements and practices in the reference document.  |   | IAGC S5 4.1.6<br>IAGC E6            |



| <b>2.11 Explosives</b> | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>References: IAGC S5 5.1 IAGC S6 3.3 &amp; 3.0</b>                                     |
|------------------------|---|---|--|
| <b>2.11.1 Planning</b> | The relevant laws governing the storage, transportation and use of explosives in seismic operations are known, available on the crew and shall be complied with.  |   |  |
|                        | Supervisors responsible for operations where explosives are used shall meet the competencies defined in the reference.  |   | OGP M3 FMM14   |
|                        | All personnel handling explosives shall be qualified and certified to perform the allotted explosives handling tasks.   |   | OGP M3 OSM21   |
|                        | The distances of explosives storage facilities from other structures, buildings and infrastructure and shall meet the recommendations as stated in the reference.   |   | Institute of Maker of Explosives (IME) American distance tables Vol 2 June 1991.         |
|                        | Shot point locations shall 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);  |   | IAGC Contract Manual 2000  |
|                        | The measures including safety distances for the prevention of radio frequency radio frequency radiation hazards in the use of electric detonators shall meet the recommendations in the reference.  |   | IAGC S5 3.13 Institute of Maker of Explosives (IME) American distance tables Vol 20 1988 |
| <b>2.11.2 Type</b>     | Criteria of choice includes, amongst others: <ul style="list-style-type: none"> <li>- avoid nitro-glycerine based products (more hazardous, adverse health effects);</li> <li>- buoyancy (buoyant charges may be a problem);</li> <li>- self-destruction time (in case of misfire);</li> <li>- type of packaging, feasibility of using anchor plugs.</li> </ul> |   |  |

| <b>2.11 Explosives</b>                             | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>References: IAGC S5 5.1 IAGC S6 3.3 &amp; 3.0</b> |
|--|---|---|--|
| <b>2.11.3 Transportation (land, water and air)</b> | <p>Procedures shall be in place for explosives transportation (land, water and air), which shall include the following controls:</p> <ul style="list-style-type: none"> <li>- route to be planned to avoid populated areas;</li> <li>- journey management;</li> <li>- transport to be parked at safe distance from any sensitive area.</li> <li>- no night transportation;</li> <li>- no smoking during loading transportation or unloading;</li> <li>- no transportation of explosives during thunderstorms;</li> <li>- no other dangerous or flammable materials conveyed;</li> <li>- no unnecessary passengers;</li> <li>- transport should not be loaded beyond its authorised capacity;</li> <li>- licensed, and competent driver;</li> <li>- driver to be trained in fire fighting;</li> <li>- dedicated transport for transportation of explosives;</li> <li>- good mechanical condition;</li> <li>- transport regularly inspected;</li> <li>- visibly marked with danger and no smoking signs;</li> <li>- equipped with at least 2 fire extinguishers;</li> <li>- do not use petrol engines in transport;</li> <li>- dynamite and detonators shall be transported separately;</li> <li>- detonators shall be carried in appropriate containers (Faraday Cage);</li> <li>- explosives may be transferred from one carrier to another within the project area, provided this is done under proper supervision and not done in congested or populated area.</li> </ul> |   | <p>OGP S1 17.11.0 42/46<br/>IAGC S5 9.9, 9.12</p>    |
| <b>2.11.4 Storage</b>                              | Storage of explosives shall comply with local regulations.  |   | IAGC S5 5.1.3  |
|  | Only competent personnel shall be made responsible for the control of explosive inventories.  |   | OGP M3 FMM14   |
| Storage - locations                                | <p>Explosives storage location(s) shall be:</p> <ul style="list-style-type: none"> <li>- at safe distances from occupied places;</li> <li>- in areas clear of any combustible material for at least 15 m.</li> </ul>  |   |  |
| Magazines  | <p>Explosives Magazines shall comply with the following:</p> <ul style="list-style-type: none"> <li>- be of sound construction;</li> <li>- efficient lightning conductor;</li> </ul>  |   | IAGC S5 3.15   |
|  | <ul style="list-style-type: none"> <li>- adequate earthing;</li> <li>- controlled access and adequate security;</li> <li>- temperature extremes controlled;</li> <li>- adequate ventilation around explosives;</li> </ul>   |   |  |

| <b>2.11 Explosives</b>          | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>References: IAGC S5 5.1 IAGC S6 3.3 &amp; 3.0</b> |
|---------------------------------|---|---|--|
| Temporary Field Storage         | Temporary storage facilities for explosives in the field shall have: <ul style="list-style-type: none"> <li>- adequate security;</li> <li>- adequate weather protection;</li> <li>- adequate ventilation;</li> <li>- up to date inventory.</li> </ul>   |   |  |
| Separation from other materials | Explosives to be stored in isolation of other materials.<br>Detonators always stored away from explosives.  |   |  |
| Housekeeping                    | Area to be kept clean.<br>Empty boxes to be removed from site.  |   |  |
| <b>2.11.5 Shot hole loading</b> | Compliance with guidelines, requirements and practices in the reference document.   |   | IAGC S5 4.1.5  |
| <b>2.11.6 Shot Firing</b>       | Compliance with guidelines, requirements and practices in the reference document.<br>Procedure for misfires shall be in place.  |   | IAGC , 5.1.5   |
| <b>2.11.7 Disposal</b>          | Procedures shall be in place for explosives, which shall include: <ul style="list-style-type: none"> <li>- consulting manufacturer for large quantities or badly deteriorated explosives;</li> <li>- safe distances;</li> <li>- lookouts posted;</li> <li>- no mixed explosive types during disposal by detonation;</li> <li>- small controlled quantities;</li> <li>- deteriorating safety fuses to be burned</li> </ul> |   |  |

| <b>2.12 Vibroseis</b>         | <b>Minimum expectation required to control the hazard(s) / risk(s)\</b>                                  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements: IAGC S5 5.2</b> |
|-------------------------------|--|---|--|
| Training                      | Driver and mechanic training to be conducted.  |   | OGP M3 OSM3<br>OGP M3 OSM17                      |
| Awareness                     | All employees involved with vibrators to be aware of the risks of high pressure.                         |   | OGP M3 AM24                                      |
| Maintenance                   | Maintenance schedules shall be defined.  |   |  |
| Force                         | Distances and force values shall be pre-defined avoid environmental damage to structures like buildings. |   |  |
| Environmental Impact / Spills | Procedures shall be in place to minimise impact in case of a hydraulic spill.                            |   | IAGC E6  |

| <b>2.13 Survey and line operations</b> | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|--|---|---|-------------------------------------|
| <b>2.13.1 Surveying</b>                | Compliance with guidelines, requirements and practices in the reference document:   |   | IAGC S5 3.13                        |
|  | - brush cutting;  |   | IAGC S5 3.13.1                      |
|  | - tree felling and chain saw operations;  |   | IAGC S5 3.13.2                      |
|  | - bridging;   |   | IAGC S5 3.13.3                      |
|  | <ul style="list-style-type: none"> <li>- A comprehensive set of procedures for working on steep slopes shall be developed if working on steep slopes, which shall include: <ul style="list-style-type: none"> <li>- surveyors to identify hazardous areas and indicate on pilot sketchlines;</li> <li>- the use of specialists (Andinists or Alpinists) for very steep terrain;</li> <li>- training of personnel on techniques for working on slopes;</li> <li>- go/no-go instructions;</li> <li>- Medevac preparations adapted to terrain, e.g. helicopters with winches for evacuation;</li> <li>- PPE for working on slopes including boots with ankle support and proper non-slip soles.</li> </ul> </li> </ul>   |   |                                     |
| <b>2.13.2 Mine clearance</b>           | <p>A mine clearance plan shall be developed based on Company's specialised assessment of the area:</p> <ul style="list-style-type: none"> <li>- A comprehensive set of mine clearance procedures shall be developed, to include but not limited to:</li> <li>- compliance with relevant local military and civil regulations;</li> <li>- qualified specialists will be contracted to locate and destroy mines;</li> <li>- provide visible marking of hazardous zone</li> <li>- strict enforcement of procedures on access to mined areas;</li> <li>- go/no-go instructions;</li> <li>- daily report on mine clearance and accessible areas;</li> <li>- training and meetings on the danger of mines and identification of restricted areas;</li> <li>- provision and use of specialist mine clearance PPE.</li> </ul> |   |                                     |

| <b>2.13 Survey and line operations</b>   | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b> |
|--|---|---|-------------------------------------|
| <b>2.13.3 Water and river operations</b> |   |   |                                     |
| Competence                               | All exposed personnel to be swim tested before being exposed to water or river operations.  |   | IAGC S5 2.12                        |
| Operations / procedures                  | Documented procedures shall be in place for water borne operations, creek and river crossing: <ul style="list-style-type: none"> <li>- all crossing points are approved by crew management before use and clearly marked;</li> <li>- prohibition against water crossing alone;</li> <li>- prohibition against bathing in unauthorised areas.</li> </ul> |   |                                     |
| Recovery (PPE)                           | All exposed staff to wear approved PFDs.  |   | IAGC S5 2.11                        |
| Boat operations at night                 | Compliance with guidelines, requirements and practices in the reference document.   |   | IAGC S5 3.18.2                      |
| <b>2.13.4 Ice operations</b>             | Compliance with guidelines, requirements and practices in the reference document.   |   | IAGC S5 3.17.6                      |

| <b>2.14 Land recording operations</b>                                    | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>             |
|--|---|---|---|
| Safety equipment   | All recommended PPE to be worn according to conditions.<br>Recorder cabins to be fitted with fire extinguishers, carbon monoxide detectors (where appropriate). |   | OGP M2 App V Table V.5<br>IAGC S5 2.10 and 2.11 |
| Communications between base-camp and field operations                    | Compliance with guidelines, requirements and practices in the reference documents.  |   | OGP M2 App V Table V.3<br>IAGC S5 3.11          |
| Cable pick up / lay out by (vehicle and manual)                          | Compliance with guidelines, requirements and practices in the reference document.   |   | IAGC S5 3.14                                    |
| Line Checking  | In areas of high risk, (swamp, very rough terrain), line checkers to work in pairs as a minimum, using the buddy system.  |   |   |
| Environment  | Cable pick up crew to ensure that no trash has been left on line location.  |   | IAGC E6   |
| Additional requirements for different types of land recording operations | Compliance with guidelines, requirements and practices in the reference documents for the following types of operations:  |   |   |
|  | - night operations;   |   | IAGC S5 3.18.1                                  |
|  | - helicopter operations;  |   | IAGC S5 9                                       |
|  | - road operations;  |   | IAGC S5 3.18.3                                  |
|  | - operations during electrical storms.  |   | IAGC S5 3.15                                    |

| <b>2.15 Cranes / lifting devices</b>                                 | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements IAGC S6 4.13</b> |
|--|--|---|--|
| Integrity of cranes, davit, winches and other lifting systems        | <p>The following shall be in place to demonstrate the integrity of cranes:</p> <ul style="list-style-type: none"> <li>- lifting register of equipment;</li> <li>- valid certification / approved type;</li> <li>- preventive maintenance system in place;</li> <li>- structural condition of foundations / lifting points;</li> <li>- SWL ratings for dynamic loads lifted from seaways (marinised systems);</li> <li>- regular inspection/reports on condition of stops and limit switches;</li> <li>- pull tests for winches carried out at regular intervals.</li> </ul>  |   |  |
| Integrity of lifting wires / slings/ pallets / hooks / barrel clamps | <p>The following shall be in place to demonstrate the integrity of lifting wires / slings/ pallets / hooks / barrels:</p> <ul style="list-style-type: none"> <li>- preventive maintenance plan;</li> <li>- lifting register to identify wires / slings;</li> <li>- all hooks shall have safety latches.</li> </ul>   |   |  |
| Control systems  | <p>All cranes and lifting devices shall have:</p> <ul style="list-style-type: none"> <li>- clear controls (centre sprung);</li> <li>- remote control systems – interlocks / accidental operation security of spare systems;</li> <li>- safe positioning of controls with respect to load;</li> <li>- cranes shall have limit stop switches and alarms.</li> </ul>  |   |  |
| Operations / procedures  | <p>The operation of all cranes and lifting equipment shall be carried out with:</p> <ul style="list-style-type: none"> <li>- permit to work / lockout tagout procedure in place during maintenance;</li> <li>- inspection routines in place;</li> <li>- trained and competent operators;</li> <li>- assigned operators/banksmen;</li> <li>- standardised signals;</li> <li>- suitable communication means;</li> <li>- use of appropriate PPE;</li> <li>- safe working angles / loads clearly marked;</li> <li>- use of tag lines;</li> <li>- dropped object protection of safety critical equipment /personnel.</li> </ul> |   | OGP M3<br>OSM18 A & B                            |

| <b>2.16 Airguns and High Pressure air systems</b> | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements IAGC S6 Section 3.1</b> |
|---|--|---|---|
| Integrity of HP air systems including compressors | <p>The integrity of air compressor and high pressure (HP) air systems shall be demonstrated by:</p> <ul style="list-style-type: none"> <li>- certification of system;</li> <li>- preventive maintenance plan;</li> <li>- hydrostatic testing;</li> <li>- position / design and operation of relief valves / burst disks;</li> <li>- operation of shut downs / emergency stops;</li> <li>- protection of flexible hoses (minimise in design);</li> <li>- testing of relief valves and safety devices;</li> <li>- condition of manifold valves for bypass – leave drain valves open;</li> <li>- competence of fitters / repairers.</li> </ul>  |   | Class (if denoted)<br>OGP M3 OSM17                      |
| Integrity /design of array systems and air guns   | <p>The integrity of the air gun array systems and air guns shall be demonstrated by:</p> <ul style="list-style-type: none"> <li>- design of array to minimise manual handling / ergonomics;</li> <li>- design of array to minimise shock / damage to guns during deployment / recovery;</li> <li>- preventive maintenance plan;</li> <li>- no local modifications;</li> <li>- inspection routines.</li> </ul>  |   |   |
| Airgun operations / procedures                    | <p>Airgun operational procedures shall be in place, which shall include:</p> <ul style="list-style-type: none"> <li>- safe system of work for maintenance – procedures;</li> <li>- awareness training in the risks of high pressure (HP) air;</li> <li>- warning signs /signals when air on deck;</li> <li>- ergonomics – manual handling of guns / heavy parts is minimised;</li> <li>- safe system of work if test firing;</li> <li>- minimisation of aired guns on deck – bled down before recovery to deck;</li> <li>- medical emergency procedures in place in case of HP air injury;</li> <li>- lockout / tagout of electrical systems during maintenance;</li> <li>- awareness of explosion risk of oil in HP air lines / non-greasing philosophy.</li> </ul> |   | OGP M3 OSM17<br>OGP M3 OSM30<br>OGP M3 AM24             |

| <b>2.17 Backdeck marine operations</b>   | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>                                     |
|--|--|---|---|
| Working environment  | Working areas (Back deck) should be designed and maintained to achieve: <ul style="list-style-type: none"> <li>- protection from adverse weather;</li> <li>- adequate levels of lighting;</li> <li>- identification of high noise areas with PPE warning signs;</li> <li>- deck areas maintained and cleaned and kept free from obstructions;</li> <li>- PPE – wet/cold weather wear available.</li> </ul> |   | IAGC S6 3.2 and 3.5   |
| Fire prevention/detection / protection   | Back deck fire prevention measures shall include but not limited to: <ul style="list-style-type: none"> <li>- identification of where smoking is permitted;</li> <li>- PTW for hot-work on b/deck;</li> <li>- provision of smoke / heat detection system in high risk areas;</li> <li>- appropriate deluge systems shall be installed over high risk areas (streamers).</li> </ul>                         |   | Class requirements<br>OGP M3<br>AM15, FMM7, OSM<br>26,28<br>IAGC S6 3.8 |
| Edge protection / protection from falls  | Use of fall arrestors when operating in open slip-ways – signed appropriately.   |   | IAGC S6 3.5   |
| Protection from dynamic loads  | The risk of injury from dynamic loads shall be reduced by use of the following but not limited to: <ul style="list-style-type: none"> <li>- design of deck to minimise exposure;</li> <li>- restricted access areas;</li> <li>- no unnecessary personnel on deck;</li> <li>- clear access-ways with adequate width;</li> <li>- guarding of equipment;</li> <li>- correct use of wires / ropes.</li> </ul>  |   | IAGC S6 3.2 3.5<br>OGP M3<br>OSM 14,<br><br>OSM18B                      |
| Protection from electrocution from active seismic electronics (streamer)               | All power to be removed from streamer when (dis)connecting sections;   |   | IAGC S6 3.5-21  |
| Emergency response / equipment / communications  | Emergency life raft available / launched from back deck.<br><br>Video monitoring of b/deck by bridge.  |   |   |
| Portable equipment / hand tools  | Use of low voltage electrical tools, RCCBs, air powered tools preferred; preventative maintenance/ portable appliance testing.   |   | IAGC S6 2.9 Tools<br>OGP M3<br>FMM11                                    |
| Certification/testing of load bearing equipment  | Winches, booms, cranes, wires, chains, cables, tie down points, pad-eyes and devices proof tested and maintained under survey.   |   | See 2.15Cranes / lifting devices  |
| Defined procedures for safety critical operations; limitations on back deck operations | Procedures for recovery, deployment<br>Clear statement on how/when b/deck operations stop or can be re-started.  |   | IAGC S6   |
| Housekeeping   | Minimisation of slip/trip hazards.<br>Proper stowage of equipment.<br>Equipment tied down in adverse weather.  |   | IAGC S6   |



| <b>2.17 Backdeck marine operations</b> | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>  | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements</b>                        |
|--|---|---|--|
| Environmental protection               | No rubbish to be thrown overboard.<br>Streamer fluid drainage to tankage, not over the side; spills kit available on b/deck; personnel trained in use.          |   | MARPOL<br>IAGC S6<br>OGP M3<br>AM26, FMM3,                 |
| Protection from HP air risks           | Identification of HP air hazards, identification of when HP air is present/in use on deck.  |   | OGP M3 AM24,<br>FMM16, OSM17                               |
| Handling / storage of batteries        | All batteries to be stored correctly in designated areas.<br>Procedures established for handling lithium batteries.<br>Personnel trained in handling batteries. |   | IAGC S6 3.11<br>OGP M3 AM26,<br>FMM24<br>See Section 2.7.7 |

| <b>2.18 In-water repairs and maintenance</b>                              | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements IAGC S6 3.6</b> |
|---|--|---|---|
| General Operations  | Operational planning and execution shall be carried out in accordance with reference.  |   | See Section 2.4                                 |
| Specific training requirements  | All workboat crew shall have undergone training in the operation of the particular workboat type and specific in-water repair operation.<br><br>For training purposes, one trainee can be included in the workboat crew, provided this has been agreed between Company and Contractor.   |   |   |
| Tool box meetings   | Tool box meetings shall always be conducted prior to launch of workboats for in-water repair where a risk assessment of the specific operation shall be carried out.   |   |   |
| Specific hazards associated with streamer / in-water equipment and repair | Hazards specific to workboat operations shall always be assessed as part of procedure development, pre-launch meetings and operations, to include: <ul style="list-style-type: none"> <li>- dangers of being towed by streamer;</li> <li>- integrity of section changing hardware;</li> <li>- ergonomics of handling equipment over side of small boat;</li> <li>- isolation of streamer power;</li> <li>- tangling with surfaced streamers;</li> <li>- navigation of small boat relative to the streamer not the vessel(s);</li> <li>- support / auxiliary vessel safety when they take equipment in tow (tangling props etc.);</li> <li>- boarding of in-water gear;</li> <li>- fire risks (e.g. lithium batteries);</li> <li>- quick releases of equipment;</li> <li>- visibility and adverse weather;</li> <li>- dangers of in-water flora/fauna;</li> <li>- affects of sun/salt/heat/cold on crew.</li> </ul> |   |   |
| In-water repair procedures  | Workboat operations shall be permitted only where procedures have been specified and validated in exercises.   |   |   |

| <b>2.18 In-water repairs and maintenance</b> | <b>Minimum expectation required to control the hazard(s) / risk(s)</b>   | <b>Remark, alternative or exception</b> | <b>Reference(s) to requirements IAGC S6 3.6</b> |
|--|--|---|---|
| Prohibited tasks                             | <p>A Manual of Permitted Operations (MOPO) shall be developed for in-water maintenance tasks using workboats. Such a manual for example would not permit the following in-water maintenance tasks:</p> <ul style="list-style-type: none"> <li>- air gun arrays;</li> <li>- lead-ins;</li> <li>- doors, paravanes, pullavanes.</li> </ul> <p>Personnel should not be allowed to disembark from the workboat onto tailbuoys.</p>         |   | IAGC/OGP S2                                     |
| Management of Change                         | <p>If the scope of the repair operations does change significantly, the workboat shall return to the mother vessel where a risk assessment for the new operation shall be carried out.</p>   |   |   |
| Contingency planning for workboat usage.     | <p>In the event that extensive in-water maintenance work is envisaged using work boats (e.g. 3D multi streamer operations), the following shall be required.</p> <p>A full time support vessel shall act as a rescue craft to be stationed in close proximity to the workboat while performing in-water maintenance tasks.</p> <p>The support vessel shall be equipped to recover personnel from the water (e.g. scoop or cradle).</p> |   | IAGC/OGP S2                                     |

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## **What do we do?**

Our purpose is to:

- provide information about the oil and gas exploration and production industry;
- represent our members' interests at global and regional regulatory bodies; and
- develop operating guidelines.

## **What are our aims?**

We aim to:

- increase understanding of the industry;
- work with international regulators to develop workable proposals which take full account of industry views;
- contribute to continuous improvements in industry operating standards;
- be a visible and approachable organisation to which governments and others refer on matters relating to the industry;
- maintain a large, diverse and active membership; and
- communicate issues affecting members to international bodies and the public.



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