



Exploration & Production

## GENERAL SPECIFICATION

### Seismic Acquisition

**GS EP GPA 201**

|                                          |
|------------------------------------------|
| <b>Seismic HSE for Marine Activities</b> |
|------------------------------------------|

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|------|---------|------------------------|
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|      |         |                        |
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## 1. Scope

### 1.1 Purpose

The purpose of this General Specification is to define the main Company HSE standards to be adhered by the Contractors.

These standards, based on IAGC and OGP ones ([OGP Report N°432](#)), concern the HSE Minimum Expectations and the specific requirements for each operation aspect.

### 1.2 Applicability

The following document is part of the Company Referential. It lays down the Company HSE requirements for seismic acquisition operations.

It is a contractual document in seismic operations and specifies the general standards of HSE exhibit (Exhibit A).

Thus this specification is considered by Company as an applicable standard and shall be respected.

### 1.3 Safety Regulations

When working in, and/or around Oil and Gas Field Installations whether belonging to Company or not, Contractor(s) is required to fully comply with all the Safety and Environment Instructions given by the Oil Field Authority, the Standing Instruction Manuals for Marine Operations (if any) and all the related documents and procedures available with the Oil Field Authority Representative and/or with Company Representative.

In this particular situation, Contractor(s) shall observe the following requirements:

- Minimum Safety distances to all installations as defined in the Company's oil and gas safety manual and/or specific requirements such as in situ determination derived from particular methodology ("peak particle velocity").
- Safety inspection and briefing to be conducted before entering or approaching any oil and gas field installations.
- Permanent coordination with the Company's oil and gas field Logistics and/or Safety Departments regarding the operations in progress (e.g. with regard to diving operations, rig moves...).
- Special care and supervision when working close to oil and gas field constructions and pipes.
- The implementation of any equipment on oil or gas field installations shall be considered as an operation in hazardous areas and shall be ruled under the Permit To Work (PTW) system in force on site.
- Operations that involve cutting, welding or burning etc., within the perimeter of any field installations shall not be carried out without obtaining the necessary PTW.
- Personnel H<sub>2</sub>S training, dedicated alarms (detectors), protective equipment (masks) and specific procedures when H<sub>2</sub>S risk is identified.
- Any other specific training when required.



## 2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the Contract.

### Standards

| Reference                | Title                                                     |
|--------------------------|-----------------------------------------------------------|
| ICAO Annex 14 vol I & II | Aerodrome design and operations - Heliports               |
| UKCAA – CAP 437          | Offshore helicopter landing areas – guidance on standards |

### Professional Documents

| Reference        | Title                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------|
| OGP Report N°432 | Managing HSE in a geophysical contract                                                                                    |
| OGP Report N°343 | Managing Health for field operations in oil & gas activities                                                              |
| OGP Report N°398 | Health aspects of work in extreme climates. A guide for oil and gas industry managers and supervisors, OGP, December 2008 |
| JNCC Guidelines  | Guidelines for Minimising the risk of Disturbance and Injury to Marine Mammals from seismic surveys                       |

### Regulations

| Reference            | Title                                                                    |
|----------------------|--------------------------------------------------------------------------|
| MARPOL               | International Convention for the Prevention of Pollution from Ships      |
| WCA 1981             | Wildlife and Countryside Act, 1981                                       |
| Bern Convention 1979 | Convention on the Conservation of European Wildlife and Natural Habitats |
| Directive 92/43/EEC  | Conservation of natural habitats and of wildlife and fauna               |

### Codes

| Reference | Title                                |
|-----------|--------------------------------------|
| ISPS Code | International Ship and Port Security |



## Other documents

| Reference      | Title |
|----------------|-------|
| Not applicable |       |

## Total General Specifications

| Reference     | Title                                                                                  |
|---------------|----------------------------------------------------------------------------------------|
| GS EP LSO 202 | Personnel transfer between watercrafts and between watercrafts and Offshore structures |
| GS EP MED 060 | Onsite medical structures                                                              |
| GS EP MED 061 | Medical support for E&P sites                                                          |
| GS EP MED 062 | Hygiene in bases and living quarters                                                   |
| GS EP MED 063 | Specific risks: clinical and therapeutic elements                                      |
| GS EP GPA 202 | Seismic HSE for Land Activities                                                        |

## 3. General

### 3.1 Vessel age minimum requirements

| Vessel type                                                                                                                                        | Maximum age     | Remark                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Vessel converted to seismic purpose but built originally for other task</p> <p>-----</p> <p>Chase boat –<br/>Support boat –<br/>Supply boat</p> | <b>20 years</b> | <p>Maximum age cannot exceed 20 years</p> <p>Vessels OVPQ (Offshore Vessel Particular Questionnaire) input in the OVID (Offshore Vessel Information Database) of OCIMF (Oil Companies International Marine Forum)</p>                                                                                                                                                                                                                                                               |
| <p>Vessel built for seismic purpose (including source vessel)</p>                                                                                  | <b>None</b>     | <p>Hull <b>less</b> than 20 years old since built : to be inspected by Total Logistic Department (or specialist approved by Total Logistic Department) less than 24 months before mobilization</p> <p>-----</p> <p>Hull <b>more</b> than 20 years old since built : to be inspected by Total Logistic Department (or specialist approved by Total Logistic Department) less than 12 months before mobilization and full history of vessel to be attached to Contractor's tender</p> |



For all vessels engaged in seismic operations, acceptance from Company will depend on an OVID inspection further input in the OVID (Offshore Vessel Information Database) of OCIMF (Oil Companies International Marine Forum).

### 3.2 Emergency towing tests

As the risk of master vessel blackout has been identified as having a low occurrence probability but a high damage potential -with modern seismic vessels-, an emergency towing test is to be performed during the seismic vessel mobilization phase. This test does not request a real towing action (it can be initiated and then achieved till a messenger line is linking the two vessels) but has to ensure the following:

- Efficient communication test between the bridges
- Availability of the minimum towing equipment needed (equipment verified prior testing)
- Competency of the deck crew and bridge personnel engaged on both vessels
- Full understanding of the procedure
- Efficiency of recovery plan in case of incident and related escalation

Before the towing test a tool box meeting (supported by a consistent JRA) is to be held on both vessels to ensure the full understanding of the drill purpose and achievement. The presence of the Company RSES on the towed seismic vessel bridge is mandatory during the tool box meeting and the full test. After test completion, a debriefing meeting with all actors is to be performed on both bridges. Action points raised during these meetings are to be integrated in the master vessels remedial action plan. A written report of the drill is to be written and transmitted to the Company RSES.

Concerning the undershooting operations, as a source vessel is to be mobilized and involved in close passes operation, the towing test involving this vessel and a dedicated towing support vessel (available during the close passes) will be performed depending on the operation JRA conclusions. As the test is mainly a global control of the various means implemented on the fleet by the seismic Contractor, in case a support vessel supposedly assigned to emergency towing task (amongst others) is out of order during the operation, it is the responsibility of the seismic Contractor to replace the vessel by an equivalent one and perform a emergency towing test with the new support vessel.

Emergency towing tests do not need to be performed while seismic gears are deployed.

## 4. Personal Protective Equipment

Contractor shall provide all the necessary and appropriate Personal Protective Equipment (PPE) to all personnel (including Company's personnel and visitors) upon their arrival on the survey area.

In addition to a minimum of two (2) coveralls for each employee, one (1) for visitor a full complete set of PPE shall be provided. This includes but not limited to: helmet, goggles, ear protections, gloves and safety shoes.

Visitors' means: Company Representatives, Auditors, Company Personnel from affiliate, Company Personnel from Head Quarters and all Officials.

Positions like mechanics and any other dealing with hydrocarbons and/or water shall be provided with three coveralls. Bakers, cooks, waiters and all personnel working in the galley shall receive a minimum of two uniforms.



Hard hats shall be replaced as per expiry date or if any crack is observed on it.

Gloves shall be provided at need, as well as dust mask and ear plugs. Safety glasses shall be replaced when worn. Depending on weather and terrain condition, sunglasses and dust masks can be requested by Company Representatives.

A list of PPE and schedule of renovation shall be provided to the Company Supervisor within the first month of operations.

A sufficient stock of PPE(s) shall be present all time on site to avoid any shortage and kept up to date by the HSE Advisor. A log book, or a data base shall be available to ease the PPE(s) management. Once a month a physical inventory shall be done and figures provided to the Company Representative. All worn PPE(s) shall be replaced by the HODs (Head of Department). Contractor is eventually responsible of PPE(s) wearing by all workers regardless of damaged or lost equipment by the employee.

PPE(s) are mandatory where required during work hours, field trips and/or visits.

PPE(s) described as regular PPE(s) needed for specific tasks and worksites are mandatory (see Appendix 1). In some cases some PPE(s) could not be worn because of a specific situation this would be approved or not by the Company Representatives on site.

All specific crews or activities not initially planned or not mentioned in Contractor PPE(s) table, shall be subject to mandatory health and safety hazard analysis to establish list of mandatory PPE(s) together with relevant safe work procedure. Same analysis shall be needed for unusual work conditions or sudden condition changes. Company Representative has to agree on new PPE(s) assignment or change.

## 5. Small Boats Operations

### 5.1 Passengers

A safe successful boat trip requires the crew of a boat to work as a team. Consequently, any passenger should consider himself as part of the team and assist the crew by cooperating with any instructions given. An important part of operating a boat safely is to keep a good lookout; a passenger can assist by staying alert and reporting sightings of other boats, debris in the water or anything considered to be defective or unsafe. Do not move in the boat as it may affect the trim and balance of the boat and make it difficult to steer or unstable.

If passenger feels that something about the journey in the small boat is unsafe he can refuse to travel but shall discuss the reasons with the coxswain or Captain of the mother vessel.

When passengers are transferring from a small boat to another vessel they are not to be put under duress if they feel they cannot do the transfer safely or they are not confident. They have to discuss this with the crew – sometimes a different method can be tried that will make them feel more confident.

#### 5.1.1 PPE's

- Hardhat

Head protection on the mother vessel is mandatory; the most common protection is canoeist type helmets that give some side protection. It is compulsory to wear head protection during hoisting and lowering down in the boat.



- Cold water and weather protection

When the air and the water are cold, passengers shall be provided with a SOLAS approved cold water immersion suit to wear. It is important to wear this properly with all zips and fasteners set up correctly.

Inspection, maintenance and certification register shall be in place.

- Lifejacket

Life Jackets are also called Personal Flotation Device (PFD). They have either automatic or manual activation. All life jackets are to be SOLAS approved with dual chambers.

All passengers shall be briefed on how to activate the PFD if it is a manual activation or if the automatic inflate fails on an automatic PFD.

Inspection, maintenance and certification register shall be in place.

- Emergency Position-Indicating Radio Beacon (EPIRB)

It is recommended to equip crews with lifejackets fitted with a personal EPIRB. It will send a signal so that a search vessel or aircraft can locate the beacon. They are usually set to activate automatically when a person falls overboard. In case the life jackets are not fitted with EPIRB, an independent one can be carried by each person on board small boats. Before embarking (during the tool box meeting) EPIRB tests are to be done, any deficient equipment is to be isolated.

Inspection, maintenance and certification register shall be in place.

- Footwear

In small ancillary boats (FRC, FRB, work boat) safety boots or shoes with anti slippery sole are mandatory.

- Gloves

Gloves are mandatory for all handling operations.

- Glasses

Sunglasses are recommended to reduce the effect of glare and will also shield the eyes from spray.

- Sun screen

Application of sun barrier cream is recommended for trips exceeding 30 minutes to prevent sunburn.

In addition to all PPEs, a sufficient amount of water is to be embarked on board and stock verified at each small boat launch.

### 5.1.2 The Crew

Normally there are two crew members on a small boat in addition to the coxswain. The crew assists the coxswain during vessel operation and shall assist passengers during transfers.

- Pilots

Pilots are masters on board and have authority on personnel.

Pilots shall be trained, qualified and experienced.



Pilots shall be trained for first aid and fire fighting.

Pilots shall be trained and aware of "Man Over Board (MOB)", "Medevac", "Fire", "Lost Vessel", "embarking and disembarking personnel and equipment" and "Refuelling" procedures.

Pilots wear life jacket, coverall, proper shoes and use kill-cord on light boats.

- Coxswain

The coxswain is in charge of the boat and is responsible for the safety of the crew and passengers and for the safe operation of the boat. Industry standards mean that the coxswain shall be trained, qualified and experienced.

- Captain of the mother vessel

The Captain has overriding authority over all operations conducted by and from the vessel including small boats operations.

## 5.2 Boats

The main types of boats used for passenger transfer are Fast Rescue Crafts (FRC) and work boats.

Boat shall be in good conditions with certificate, insurance and documentation on board.

Boat name / number shall be easily readable.

Boat shall be inspected / audited before assigned to operation through a specific check-list.

Boat fleet maintenance and follow up records shall be in place and communicated to Company.

Boat shall be clean, tidy and in good general conditions.

Minimum HSE equipment shall be provided:

- Approved flotation devices for each person and a life ring with 15m rope fixed to vessel
- Fire extinguisher
- Extra line or rope
- Paddles (x2)
- First aid kit (including seasickness tablets)
- Basic tool kit including shear pins and flashlight
- Ample fuel
- Kill-cord (dead-man's handle or switch)
- A waterproof VHF radio
- 2 ropes minimum (front and rear) to moor or attach to other vessel
- One anchor
- Passengers + pilot maximum number displayed in the boat
- Stickers "no smoking", "floatation life jacket mandatory"
- Emergency kit complying with boat category and containing at least: waterproof torch, distress flares, plastic bailer, signalisation mirror, compass.



- Horn or whistle

All boats shall be Diesel twin engine.

"Man Over Board", "Medevac", "Fire" and "Lost Vessel" procedures shall be available onboard.

Prospect and area maps shall be available onboard.

Vessel tracking system shall be GPS based.

Pilot seat is to be fixed.

Fuel tank shall be labelled and free of leak.

Skid surface shall be avoided.

### 5.2.1 Supply Vessel (extra requirements)

Supply vessels are subject to the requirements detailed in section 3.1.

In addition to the scope of an OVID inspection, the equipment required to perform her work will be verified (e.g. bunkering equipment including pipes, hoses, valves etc.).

### 5.2.2 Workboat (extra requirements)

2 workboats are expected for a streamer length above 42 km.

The time of pre launch toolbox meeting shall be planned and communicated to the people involved including passengers. Attendance is mandatory for everybody involved in the operation. Briefing on the trip and distribution of PPE such as hard hat, Personal Flotation Device (PFD) and immersion suit if required will take place. Boarding the boat shall be performed either at the davit or through a dedicated door in the ship side. No one to board the boat until instructed to do so by the crew. Crew shall tell where to stand or sit. When the boat is ready to launch, the davit operator will swing it out from the ships side – the boat may start to swing at this stage and occasionally bounce off the ship side – it is very important to have a good handhold for all the passengers.

- Permit to work and toolbox meeting

If the boat is operated from a mother vessel there should be a toolbox meeting before the boat is launched, at the same time a permit to work form shall be filled out to ensure that it is safe to launch the boat and safe to transfer passengers. At the toolbox meeting, safety issues shall be discussed.

- Journey management

The time of departure shall be recorded and radio contact maintained with the work boat throughout the deployment. If radio contact with the boat is lost, there are procedures to immediately send another boat to investigate.

## 5.3 Hazards

- Movement of the boat

Small boats used in the industry can travel at speeds up to 30 knots; movement of a small boat can easily throw a person out of board it can be unpredictable and rapid. The most uncomfortable place to be is at the bow – the least movement at the stern.



- Pitch, roll and heave

Pitch is the movement of the boat that causes the front of the boat to go up and down; roll of course is the rolling movement from side to side, and heave is the vertical rise and fall of the entire boat.

All these movements can occur at the same time therefore, it is very important to hold a handhold especially when moving in the boat.

- Seasickness

Seasickness is also known as motion sickness. Acute and prolonged seasickness can be life threatening. Seasickness is debilitating and will affect your judgement, situational awareness and physical abilities. Medications are available to prevent seasickness. Most passengers should generally stay into a small boat for a short period.

- Crushing

When a small boat is alongside a ship or another boat, there is the hazard of getting body parts crushed between the boats. Do not let hands on the edges of the boat and follow the instructions for transferring to avoid having feet and legs crushed. When the boat is being lowered or raised it is advisable to stay on the outboard side for this reason. Support vessels usually have large tyres for fenders along their sides, that require being especially careful with.

- Falling

Such hazards are falling overboard from the boat while it is in the water and falling from the boat when it is on the davit or while being hoisted and lowered.

- Struck by

It is possible to be struck by the davit lifting wire arrangement and the hull or superstructure of other boats or ships while alongside.

- Slipping and tripping

All parts of a small boat can become slippery when wet or contaminated with cable oil or grease, even over non skid surfaces. Some support vessels have low freeboard and the decks can become extremely slippery.

- Working at heights

When boarding or disembarking from a small boat on the davit you may be at a considerable height above the water.

- Stinging biting marine animals

A hazard exists from sea snakes, jellyfish and sharks in some parts of the world, mainly in tropical seas. Avoid touching or disturbing marine animals even if they appear to be dead.

- Ropes

If the boat is alongside a wharf or jetty there will be ropes used to secure it alongside. A bight is a loop in a rope. Standing in the bight of a rope is dangerous because when the rope becomes tight you will be trapped in the loop and most probably injured. Synthetic ropes under tension will snap back if they break and can cause severe injuries, stay out of the line of recoil of a rope under tension.



- Noise

Engine noise in some small boats may be above the safe limit, in such case specific PPE(s) have to be worn.

- Cold

In areas where air temperature or water temperature are low, passengers you should be given an immersion suit. A combination of wind, spray and low temperatures can cause hypothermia that develops rapidly.

- High pressure hydraulic hoses and pipes in good conditions
- High pressure air hoses and pipes in good conditions
- Manometers operatives

## 5.4 Emergency

- Boat Emergency Equipment

Small boats should be equipped with emergency equipment as required by industry, flag states, and international maritime regulations. Refer to section 5.2 for details.

- Fire

Fire is a serious situation in a small boat as a fire that cannot be extinguished quickly will mean abandoning the boat. All boats are equipped with a fire extinguisher. Smoking is forbidden.

- Capsize

Activate PFD and EPIRB, stay with the boat, and follow the crew's instructions. FRC type boats and some workboats have self righting equipment that will right a capsized boat – usually an inflatable bag that is activated by the crew.

- Collision

If you see a collision is imminent brace yourself and hold on tight. Boats can collide with other vessels, structures or wharves and jetties.

- Engine failure

Engine failure can be a serious hazard if it occurs close to the side of the mother vessel where the boat can drift back into trailing equipment.

- Sinking

Passengers shall have done a mandatory sea survival course before going offshore. They will have to use the techniques learnt during this training and follow the instructions of the crew.

## 6. Transfer of Personnel

This Work Instruction shall be followed when transferring personnel directly between a Contractor vessel and a supply/support vessel. Transfer of personnel using basket shall be avoided as much as possible. Reference document: [GS EP LSO 202](#).



## 6.1 General

The main risks involved in direct vessel to vessel transfers are that the transferring personnel may fall overboard or are trapped between the vessels. During all transfers of personnel, crew not associated with the transfers are to keep clear of the transfer areas.

### For all direct vessel to vessel transfers:

The Captains of both vessels shall be in command on their respective bridges. Clearance shall be obtained from the Captains of both vessels before any transfer commences.

Good radio communications between the Captain and the deck officer in charge at the transfer point on each vessel shall be established before any transfer commences. Transfers between vessels shall only take place at designated transfer stations.

The deck officer in charge at the transfer point shall ensure:

- That both points of transfer are cleared of all loose items and obstructions.
- That the deck surfaces to transfer areas are not slippery
- That the person(s) transferring and the assistants on both vessels are wearing mandatory lifejackets, suitable clothing and non-slip footwear. Immersion suits are required above latitudes of 32° North or South
- That all personnel transferring have been briefed and know and understand the transfer procedures before the transfer commences.
- That lifebuoys, boat hooks, and heaving lines are made ready for immediate use in case of emergencies.

The person(s) transferring shall do so in their own time and only if they themselves consider it safe. They shall never be coerced into making the transfer.

## 6.2 Personnel briefing

All direct vessel to vessel transfers run the risk of personnel falling overboard. However, by following a few basic safety precautions these risks are minimised and the transfer can be carried out in a safe manner.

Before any transfer the deck officer in charge of the transfer shall brief personnel on vessel to ensure that they know and understand the correct procedures.

### 6.2.1 Personnel Protective Equipment (PPE)

When transferring vessel to vessel the following PPE is mandatory:

- Lifejackets
- Non-slip footwear
- Immersion suits are required above the latitudes of 32° North or South

### 6.2.2 Precautions

Follow all the procedures.

Only transfer if you feel confident and fit enough to do so.



Only transfer if you consider it safe. You must never be coerced into transferring if you are in any doubt about the safety of the transfer.

Never carry luggage when transferring. It shall be transferred separately.

## 6.3 Procedures

### 6.3.1 Swing Rope transfer

Swing ropes will occasionally be encountered and may be used to transfer to and from a small boat to a larger vessel or a platform. Do not attempt to cross until instructed to do so.

- Firmly grasp the swing rope above the first knot above shoulder height and pull down hard to test that the rope is secure
- Keep both hands free. Grab the knotted rope close to your eye level.
- When the boat is at the top of a wave and before it starts to go down swing across by pushing off with your feet – correct timing is important, wait for a few cycles of the boats pitch and roll so you can judge the moment.
- After you are across, release the rope and get clear of the area so the next person can cross.
- Use the swing rope for balance as you step across rather than using it like a “Tarzan” swing.
- **Never get the rope between your legs.**

### 6.3.2 Pilot ladder to and from a support vessel or guard vessel

The persons transferring shall not attempt to transfer until they receive the go-ahead from the coxswain or the crew. It is recommended to have an experienced person performing first the transfer, if possible.

- Correct timing is important, wait for a few cycles of the boats pitch, roll and heave so they can judge the appropriate time.
- If using a boarding ladder, people should board the ladder when the boat is at the top of the swell or wave and climb clear of the small boat as quickly as they can do so safely. If transferring from a support vessel they should stay at a safe height on the ladder that will allow them to step into the small boat when it is at the top of the swell or wave.

## 7. Airguns and High pressure air systems

### 7.1 Integrity of HP air systems including compressors

System shall be certified.

Preventive maintenance plan shall be implemented.

Hydrostatic test shall be done.

Burst disks shall be operational, position/design and operations shall be checked.

Relief valves shall be tested and regularly checked as well as safety devices.

Emergency stops shall be operative.



Flexible hoses shall be well protected.

Manifold valves shall be in good conditions for bypass – leave drain valves open.

Fitters / repairers shall be competent.

## **7.2 Integrity / Design of array systems and airguns**

Arrays shall be designed to minimise manual handling, entrapment and pinch points (ergonomics).

Arrays shall be designed to minimise shock / damage to guns during deployment / recovery.

Preventive maintenance plan shall be implemented.

Local modifications shall not occur.

Inspections routines shall be performed on a regular basis and documented.

## **7.3 Airgun operations / procedures**

Safe system of work for maintenance – procedures shall be applied.

Awareness training on the risks of high air pressure air shall be performed.

Warning signs /signals shall be available when air pressure is active on deck.

Manual handling of guns / heavy parts shall be minimised.

Safe system of work shall be applied in case of firing test.

Aired guns on deck shall be minimised– bled down before recovery to deck.

Medical emergency procedures shall be in place in case of HP air injury.

Lockout / tag out shall be applied for electrical systems during maintenance.

Explosion risk of oil in HP air lines shall be known by the crew. Non-greasing philosophy shall be applied.

# **8. Back-Deck Marine Operations**

## **8.1 Working environment**

Back deck working areas shall be correctly designed, cleaned, kept free from obstructions and maintained.

Protection against adverse weather shall be implemented.

Adequate levels of lighting shall be provided.

High noise areas shall be identified, and PPE warning signs shall be displayed.

PPE, wet/cold weather clothes shall be available.

## **8.2 Fire prevention / detection / protection**

Back deck fire prevention measures shall be implemented.

Smoking permitted areas shall be identified.

PTW for hot-work on back/deck shall be required.



Provision of smoke / heat detection systems shall be sufficient in high risk areas.

Appropriate fire fighting deluge systems shall be installed over high risk areas.

### **8.3 Edge protection / protection from falls**

Fall arrestors shall be used when operating in open slip-ways.

Area shall appropriately be designed.

### **8.4 Protection from dynamics loads**

Design of deck shall minimise exposure.

Dedicated areas shall have a restricted access.

Unnecessary personnel shall be avoided on deck.

Access-ways shall be clear, with adequate width.

Moving parts of equipment shall be guarded.

Wires and ropes shall be certified, and inspected and used by competent persons.

### **8.5 Protection from electrocution from active seismic electronics (streamers)**

Electrical power shall be removed from streamer when (dis)connecting sections.

### **8.6 Emergency response / equipment / communications**

Emergency life raft shall be available / launched from back deck.

Video monitoring of back deck by bridge shall be provided.

### **8.7 Portable equipment / Hand tools**

Low voltage electrical tools shall be used.

Air powered tools shall preferably be used instead of electrical tools.

Preventive maintenance shall be implemented

Portable appliance shall be tested.

### **8.8 Certification / testing of load bearing equipment**

Winches, booms, cranes, wires, chains, cables, tie down points, pad-eyes shall be tested and certified by a recognised body, and maintained during survey. They shall all be identified in a lifting and rigging register.

Any damaged item shall be quarantined.

### **8.9 Procedures for safety critical operations**

Procedures for recovery and deployment of arrays / streamers shall be implemented.

Statement on how/when back deck operations stop or can be re-started shall be clearly expressed, understood and applied.



## 8.10 Housekeeping

Slip/trip hazards shall be minimized.

Proper stowage of equipment shall be done.

Equipment shall be stowed in adverse weather.

## 8.11 Environmental protection

MARPOL regulations and local laws shall be adhered.

Waste shall not be thrown overboard.

Streamer fluid drainage shall be performed in a tank, not over the side.

SOPEP procedure and SOPEP kits shall be available onboard the vessels.

Personnel shall be trained to use such equipment and conducted regular drills.

## 8.12 Handling / storage of batteries

All batteries shall be stored correctly in designated areas.

Procedures shall be established for handling lithium batteries.

Personnel shall be trained in handling batteries.

# 9. In-water repairs and maintenance

## 9.1 Specific training requirements

Workboat operations shall be permitted only when procedures have been specified and validated with training. Workboat crew shall be trained for operating with particular boats and specific in-water repairing. For training purposes, one trainee can be included in the workboat crew, provided this has been agreed between Company and Contractor.

### 9.1.1 Tool box meetings

Tool box meetings shall always be conducted prior to workboat launching for in-water repairing. A risk assessment for the specific operation shall be carried out.

## 9.2 Specific hazards associated with streamer

Hazards specific to workboat operations shall always be assessed as part of procedure development, pre-launch meetings and operations, to include:

- Dangers linked to streamer towing.
- Integrity of section changing hardware.
- Ergonomics of equipment handling along small boats.
- Insulation of streamer power.
- Tangling with streamers at water surface.
- Support / auxiliary vessel safety when towing equipment (tangling props etc.).
- Fire risks (e.g. lithium batteries).



- Quick release of equipment.
- Visibility and adverse weather.
- Dangers linked to in-water flora/fauna.
- Damaging effects of sun/salt/heat/cold on crew.

### 9.3 Prohibited tasks

A Manual of Permitted Operations (MOPO) shall be available for in-water maintenance tasks using workboats.

**It is strictly forbidden that personnel disembark from the workboat onto tail buoys.**

### 9.4 Management of change

If during intervention, it appears that there is a change in the scope of repair operations, the workboat shall return to the mother vessel where a risk assessment for the new operation shall be carried out.

### 9.5 Contingency planning for workboat usage

In the event that extensive in-water maintenance works is envisaged using work boats (e.g. 3D multi streamer operations), the following shall be required:

- 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.
- The support vessel shall be equipped to recover personnel from the water.

## 10. Closed approach and multi-vessels operations

### 10.1 Hazards identification

The offshore installations can include:

- Fixed oil and /or gas production,
- Floating production, storage,
- Semi submersible or jack-up exploration drilling unit,
- Pipe lay barge,
- Well intervention vessel or any other vessel or installation that has a fixed umbilical,
- Connection from surface to the seabed,
- Any other permanent or temporary structure.
- Under water floating lines or constructions (export lines, tower risers...)

In addition to those installations, many other constraints and activities could exist around those areas: Field and rig support vessel activities, tanker loading, helicopter operations, diving operations...

Therefore navigating close to offshore installations requires special attention to ensure the safety of the vessel and installation during the operation. The main hazards of navigating close to those installations are:

- Collision with the installation due to loss of propulsion, strong current or weather change, obstructions in surfaces...
- Collision between sub sea floating lines, structures (Export lines, tower risers...) and ROV cable or basket cable.
- Interferences with helicopter landing operations.
- Interferences with tanker loading operations
- Uncontrolled release of hydrocarbons from production platforms
- Noise and high temperature at short distance (gas flare...)
- Close pass to installations with guns and streamer deployed

## 10.2 Zone definitions

A **restricted area** is defined by the field operator or National Authority requirements around offshore installations. Within the areas, field operator is empowered to put in force regulations and constraints in order to protect its interest without interfering with international and national rules and regulations: Area with a 10 Nautical miles radius around FPSO where navigation is not permitted without permit entry.

In addition, a 500 meters **safety zone** is created automatically by decree around all offshore oil and gas installations. Safety zone field regulations are laid down by the field operator and/or National authority requirements. The zone shall be defined as an area with 500m distance from the perimeter of the installation, not the centre of the installation. Offshore installations may be large or gathered in clusters (2 or 3 platforms linked by bridge). Any entry safety zone and operations within the 500 meter zone can only take place when allowed by the OIM (Offshore Installation Manager) or equivalent.

The seismic vessel operating in the restricted area is drawn to all governing laws and recommendations concerning navigation and marine operations at sea. These laws and recommendations are to be adhered to at all times whether they are international or local. It is the responsibility of each seismic vessel Master to take any action they may deem necessary to cope with their respective obligations. All marine operations shall be done in accordance with the seismic vessel owner HSE Policy and seismic vessel operating manual.

### 10.2.1 Close pass

A "close pass" is considered to be any occasion during survey work, including undershooting where vessel (node, source or streamer vessel) is required to sail within 500 meters of any oil or gas installation (manned or unmanned).

It is the responsibility of each OOW (Officer On Watch) to determine if the vessel is approaching the 500 meters zone and that all necessary confirmation/permission is required from OIM is in order. The functions/responsibilities between the 2 navigators on the bridge, Mate in command and Assisting mate, shall be agreed before entering of the 500 meter safety zone. The Mate in command shall plan the vessel's entering of the 500 meter safety zone and manoeuvre the vessel. The Assisting mate shall control the Mate in command's plans and manoeuvring performance.



The Mate in command can at any time abort the operation if he feels there is danger for the Vessel or installation. The Captain must be present on the bridge when entering/departing the 500 meter zone.

### 10.3 Conditions for entry in the Restricted Area

#### 10.3.1 Entry permit

No vessel either chartered directly by or on behalf of the field operator is authorised to enter within the restricted area to carry out marine operations without prior approval of the Marine Technical Authority or his representative.

The Entry Permit is obtained once the vessel involved in operations has been inspected in accordance with the field operator rules. The Entry Permit could be valid for the duration of the seismic campaign contract.

The Entry permit does not allow the execution of any specific work within the limits of the safety zone (500m Area) of an installation. A specific authorisation or permit to work is delivered by the RSES of the installation.

#### 10.3.2 Radio communications

Vessels working in the restricted areas of offshore installations have to be fitted with a radio installation complying with IMO GMDSS code. In addition all vessels shall be equipped with at least two multi-channel, dual watch VHF radio sets located on the bridge/control room areas. When within the controlled area, watch-keepers on vessels must maintain a continuous radio watch on VHF channel 16 and on the agreed radio frequency for that area. SSB watch has also to be kept on field operator working frequency during all the time the vessel is on charter to or on behalf of the field operator. For seismic vessel fitted with a heli-deck, a helicopter approved VHF is compulsory.

Communication between seismic vessels and Installations of all floating supports shall attempt to contact the appropriate radio operator (marine control) on VHF channel 16, one hour prior to entering the restricted area then again when reaching the restricted area.

Radio communication seismic vessels and installation or seismic vessels / floating support in the restricted area shall be in accordance with good marine practice and shall be limited to the strict necessary.

Vessels operating within the 500m zone of installations involved in oil and gas production are instructed not to use their "High" and "Medium" radio frequencies within 500m of installations. Where practical, VHF radio transmission has to be limited to 1 (one) watt output power in order to minimise interferences between channels.

List of radio channels (Contacts) used by the different installations, vessels working in the restricted area shall be posted in the bridge

#### 10.3.3 Planning

Movements of vessels inside the restricted area shall be planned so that:

- A vessel under way does not enter the installation 500 meters zone if this is impracticable; prior clearance shall be received from the installation supervisor.
- During the approach, berthing, loading and un-berthing operations of export tankers, the navigation is strictly prohibited inside the loading buoy or tandem safety zone



- No interference with others vessels working in the area.
- No interference with helicopter operation (1000m safety perimeter from any other installation when helicopter landing on an installation).
- No interference with diving operation (1500m safety perimeter from divers when shooting)

#### 10.4 Mitigation strategy

Communication before seismic operation to be properly established between different parties involved Officer On Watch responsible to make sure that all necessary permissions required to enter in the safety zone are in order.

Specific procedure for navigating inside the Safety Zone to be drawn up by the seismic Contractor and posted in the bridge. (Hot Permit To Work, smoking, radar...).

Offshore installations, vessels working in the field of operations to be listed before the beginning of operations

Obstructions (loading buoy, anchors chains, floating pipes...) and relative hazards proper to the field to be identified

Activities that should take place in the field during the seismic operations to be identified

All hazards related to operation in vicinity of offshore installation to be identified and included on the Hazard Register of the Contractor.

All risks related to hazards identified to be assessed and include in the risk assessment of the Contractor.

Restricted areas and rules that will apply inside to be properly defined by field operator and communicated to the seismic Contractor.

Vessel must comply with all international rules and regulations and field operator own rules

Entry in the 500m area of offshore installation only permitted by the Offshore Installation Manager or his delegate.

It is the responsibility of each OOW to ensure that in the Restricted Area or safety zone a MOPO is to be drawn up according to the rules and constraints given by the field operator

A toolbox meeting shall take place involving the OOW, HSEA, PC and Client Rep. to ensure that authorization, planning, communication and special rules have been set up.

Vessel shall be set up with manual steering and Officer On Watch shall have full control of the vessel. Indeed during shooting, vessel is in navigation auto steering mode. (The Officer On Watch just adjusts the crab angle)

If applicable, vessel with a retractable bow azimuth thruster should have it deployed for back up in case of problem with the two stern thrusters

Minimum distance from installation is taken from perimeter of the installation.

Adjustments shall be done according to the dimensions of the offshore installation and its headings

Movable installations can be asked to adjust their heading according to the heading line to limit the distance to the obstruction



To maintain line shooting heading, vessel can sail on a crab position (according to currents...). It can be disturbing for some vessels, installations... that can have the feeling that vessel is coming in their direction. Therefore proper communication and explanations are compulsory to avoid misunderstanding and incidents

Drilling rig, not properly plotted on the Spectra, information of drill rig movement to be given to the seismic Contractor.

No close pass for towed equipment by recording vessel closer than 100m from offshore installations allowed (50 m for source vessel)

Specific Procedure for close pass set up in accordance with field regulation has to be included in the crew HSE plan and bridging document. (Minimum distances, notification, towed equipment ...)

24 hours notices from the OIM before entering close pass

Captain knows and understands the procedure for close pass and the field regulation

All support vessels involved in the operation properly informed about close pass procedure

Positions of obstructions in the vicinity of the installation to be checked and confirmed

Position in the navigating system of the seismic vessel bridge to be correctly plotted and checked regularly with the navigation Department, and field planning

System of navigation (Gator, Spectra...) on the bridge and navigation department to include limit of the safety perimeter, minimum distance from installation...

Positions of obstructions in the vicinity of the installation to be checked and confirmed between bridge (Using radar) and navigation system (Gator Spectra...)

All control measures of vessel true motion in place (radar, navigation screen with plot of installation, visual control...)

Emergency towing equipment ready to use. Marine crew ready to start up an emergency towing procedure. Machinery spaces manned by Chief engineer and Chief electrician

Vessel set up in DP2 mode, when vessel equipped, (Redundancy of engines, thrusters, command controls, operator...)

OIM to confirm that all activities that may interact with the seismic operation have been advised and are completed (i.e. Diving, helicopter, supply...)

Communication with installation to be established 1 hour before the close pass when entering inside the 500 m zone, when going out the 500 m zone

Crew advised that smoking is prohibited on deck. Incinerator shut down Hot work and use of naked lights prohibited on opened deck. Bow search light on during night

For close pass vessel should be set up in manual steering

Checklist with all points mentioned above to be performed before every close passes and signed conjunctly between captain and Party Chief.

## 10.5 Navigation inside the Safety Area

No navigation allowed inside the 500m area of an installation without previous authorisation given by the OIM of the installation.



The RSES has to ensure that vessel's Master is well aware of any particular marine hazards such as exposed risers, platform discharges, helicopter landing, flaring, floating pipes, mid water export lines, diving operation or any other activity carried out on the installation.

Radio communication rules of seismic vessels and installation or seismic vessels/floating support in the restricted area shall be in accordance with good marine practice and shall be at least similar of the point 10.6.2.

## **10.6 Planning and coordination of seismic operations related to field activities**

Seismic operation coordination with others field activities shall be under the responsibilities of seismic Contractor and RSES (Company Representative). Furthermore seismic Contractor and RSES shall have to ensure that the additional regulations and constraints set up by the field operator are known and properly followed.

- Seismic Contractor in line with RSES in charge to organize planning and coordination between seismic operations and field activities
- Kick off meeting to be organized between Contractor and field operator before the beginning of the operations.
- Field operator to provide position of any fixed installations and obstructions (Surface, Sub Sea...) to the seismic Contractor. Field operator to provide regular and updated planning of moving installations and field work (Drilling rig, Field support Vessels...), SIMOPS, helicopter operations, tanker operations... to the seismic Contractor.

### **10.6.1 Multi-vessel operation**

When planning a multi-vessel operation, the following points shall be considered:

- Marine coordinator have to be nominated to ensure the coordination between all the vessels during the implementation of a SIMOPS process
- Communications including language used, radio frequencies and incident communication
- Bridge requirements for normal deployment/recovery operations, production, and shooting
- Line change procedures for each vessel
- Propulsion failure for any of the vessels
- Incidents including single vessel or more than one vessel
- Small boat activities (work boats, crew boats, supplies, surfers...)
- Fishing activities (pirogues, trawlers, long lines...)
- In-water obstructions including but not limited to pipelines, platforms, wellheads, and flare pipes, buoys

### **10.6.2 Communications**

Various field activities, upon which the seismic operation may impact, shall be identified:

- Diving operations.
- Construction and pipe laying operations, pile driving.
- Tanker rails and loading schedule.



- Supply vessel movements and back loading.
- Radio silence periods.
- Platform drill and exercises.
- Platform alarms.

It should be noted that “radio silence” period associated with platform activities, such as well perforations, normally includes all radio installations within the 500 metre zone and will therefore affect the seismic activity.

Platform H<sub>2</sub>S and abnormal hydrocarbon vapour detection will also result in exclusion from the 500 metre zone. Care must also be taken when working down wind of flares.

These activities, together with relevant responsible persons, and contact details of all vessels and platforms (radio channels and telephone numbers) shall be identified and posted on the bridge and other prominent positions. Contact schedules shall be agreed. The contact list shall be posted near the radio sets onboard and a communication log established.

In many areas, platforms are unmanned. Communications shall be established with any control platform or shore based facility, where possible.

When appropriate, a briefing document shall be drawn up for the benefit and information of key oil field personnel and 3<sup>rd</sup> parties affected by the operation. Likewise, we will request a briefing document from the operator to familiarise vessel/operations personnel with all required activities of the field.

Charts of the seismic programme, together with line designations, shall be made available to the installation contact personnel to assist in communication.

When approaching a manned platform contact has been established with the control point for the platform, the following communication shall take place. Prior to the start of each line involving close approach, the following (minimum) communication sequence shall be initiated:

- The Oilfield Coordinator shall be transferred by radio channel to the applicable vessel.
- The Oilfield Coordinator shall be informed of the ETA of the vessel at the 500 metre zone, and the minimum distance shall be given.
- At 1 Km. from the installation the Oilfield Coordinator shall be advised of an updated ETA and confirmation of the minimum approach distance.
- Advisory message on clearance of all equipment and vessel(s) from the 500 metre zone.
- If at any time the boat pass is likely to be significantly closer to the installation than the information previously given, then this shall also be communicated. Similarly, if the boat pass is aborted, the Oilfield Coordinator shall be advised without delay.

## 10.7 Emergency Procedures

An “Emergency Situation” can be defined as follows:

“Any critical circumstances or situations which pose a threat to life or to equipment or to the normal control of operations”

This procedure shall be applied in the following emergency situations:

- Risk of collision during close approaches to field installations, night and day operations



- Risks of collision during multi-vessel operations

Always notify installation and other units in vicinity in case of emergency onboard, take actions to avoid drifting on installation and try to recover gear in the water if there is any chance. Make preparations for emergency towing and use all available resources to avoid a bigger emergency.

There are obvious hazards associated with “close approaches” to obstructions. Human error or mechanical failure could result in the seismic vessel or its equipment coming into contact with the offshore installation/obstruction.

The closer the nearest point of approach, the smaller the margin there is for human mistake, and the less time is available to recover from equipment or machinery failure that may result in temporary loss of control of the vessel.

If the vessel appearing to be unable to maintain its intended track, the boat pass shall be aborted immediately

During close passes, the vessel shall be operating with automatic pilot. One person shall be designated to standby the manoeuvring controls in the event that it becomes necessary to assume manual operations

The engine room shall be on contingency alert with a designated, qualified engineer standing by

The bow thrusters shall be placed on-line and ready for immediate use

Contingency Plans shall be in place and fully understood by the Bridge and Engineering Officers and all crewmembers

#### **10.7.1 Contingency Plan**

Following points shall be considered for the contingency plan:

- Oilfield Coordinator on watch on bridge
- RSES on master vessel to be continuously informed
- Work permit obtained
- Tool box meeting held with all involved personnel
- All communications tested and working
- Automatic pilot on
- Back navigation system on
- Radar fix on obstruction
- Back radar on stand by
- Bow search light on (at night)
- Support vessel on stand by
- Engine room engineer on stand by
- Bow thrusters on
- Back up generator running



- Secondary bridge on watch for manual steering
- Linesman at station
- Cable cutter ready and manned
- RSES (Oilfield) informed
- Vessel track and trailing equipment to be suitable for the close approach
- Currents, wind direction, sea state and weather conditions to be suitable
- Vessels and towed equipment have to pass with sufficient clearance from the installation
- The position of all the obstructions has been checked and confirmed
- The area is clear from any other obstructions (such as: other vessels travelling in the survey area, floating debris, canoes, fishing boats, etc.)
- No hot work is on going
- Crew has been advised that smoking is prohibited on deck
- Incinerators have been shut down
- All other vessels aware of the contingency plans

The following points could be reported and signed by all parts (Contractor party chief and oilfield coordinator/RSES) with the operation date and entering time in red zone:

- Navigation system down

Helmsman informs linesman

Helmsman steers vessel to clear area

Stop cable deployment

- Buoy up cable and mark position

RSES, Party Chief and Oilfield coordinator informed

Issue full report

- Engine failure

Helmsman informs linesman

Navigator marks position

Helmsman with thrusters steers vessel to clear area

- Stop cable deployment

Buoy up cable and mark position

RSES, Party Chief and Oilfield Coordinator informed

Issue full report

- Generator Failure

Helmsman informs linesman

Navigator marks position



Switch to back up generator

Helmsman with thrusters and main engine steers vessel to clear area

Issue full report

- Steering system Failure

Helmsman informs linesman

Navigator marks position

Switch to manual steering

Helmsman with thrusters and main engine steers vessel to clear area

## 10.8 Responsibilities

Party Chief and Marine Coordinator are responsible of the coordination of the operational sequence

The Party Chief on the master vessel will manage on operational, timing, contractual matters, etc. with the client.

The Captain on the master vessel shall have final authority on operational matters.

It is the responsibility of the Party Chief to be in attendance on the bridge whenever the vessel or towed equipment is in a specific zone area.

It is the responsibility of the Captains of the respective vessels to coordinate all external matters relating to passing traffic, navigation rules and limits, environmental conditions, and communications with rigs, platforms and diving operations etc.

Each Captain has responsibility for safety on his respective vessel.

The OIM(s) for the platform(s) (or equivalent) has ultimate and legal authority within the 500 metre (or other) exclusion zone of any offshore installation.

## 11. Helicopter operations

### 11.1 General

Total operates installations located in several countries and is required to conform to various local regulations.

According to Company's rules any vessel with an helicopter landing area shall comply with ICAO international standards ([ICAO Annex 14 vol I &II](#)) but also take account of certain adjustments taken from national regulations ([UKCAA – CAP 437](#)), the main aim being the quest for safety combined with maximum flexibility of operation.

However, this rule is written so that it may provide useful guidance on minimum standards applicable for the safe operation of helicopters to offshore helidecks throughout the world.

Helicopters enable us to work in normally inaccessible areas. Since safety depends on communication and education, safety meetings shall be held frequently with all crew members. Each new crew members shall receive a complete safety briefing before beginning any operational work with or around helicopters. It is essential to have a good understanding of hazards and to follow safe, consistent practices when using helicopters. There are two rotor assemblies on a helicopter: the main rotor and the tail rotor.



The main rotor rotates in an almost horizontal plane. It provides the lift required for flight and creates a strong rotor downwash on takeoff and landing. This blast of air can blow hard hats, plywood, metal sheet or any other lightweight material around landing area causing injury to people and damage to the helicopter. On flat ground, the main rotor blades can also "droop" dangerously close to the ground in landing and when the helicopter is being shut down.

The tail rotor is a high-speed propeller and, unlike the main rotor, is almost invisible when operating. It operates perpendicular to the ground either at chest or head height and has its own rotor wash.

Other potential hazards are hot gases from exhausts and excessive noise. All these factors, plus the fact that people are not accustomed to a propeller on the tail of an aircraft, make the tail rotor extremely hazardous. No one should approach a working helicopter without a comprehensive briefing. Stay in direct eyesight of the pilot at all times and approach the helicopter as directed by the pilot. Never approach from the rear.

## **11.2 Training requirements**

All personnel transferring via helicopter shall have attended industry recognized sea survival and Helicopter Underwater Escape Training (HUET), both having to be renewed every four years.

The designated Helicopter Landing Officer (HLO) shall have attended a recognized and certified HLO course.

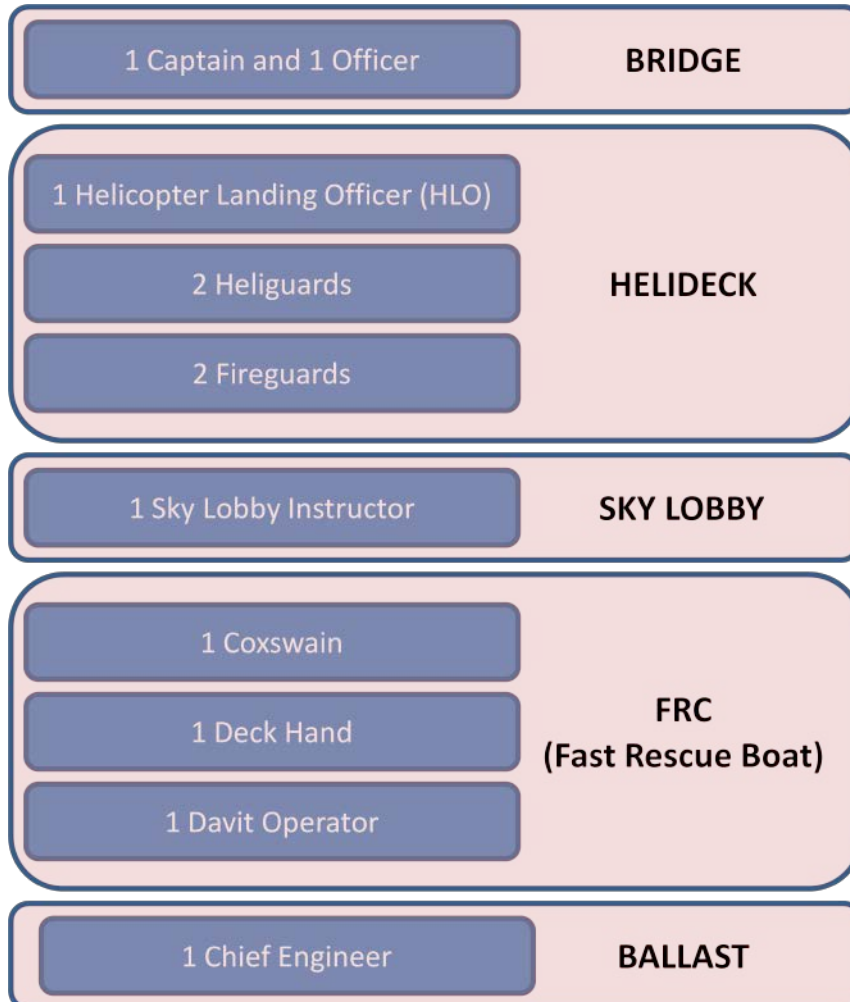
There should be at least of two HDAs (Helicopter Deck Assistant) onboard who have completed an approved training course.

## **11.3 Responsibilities**

### **11.3.1 Helicopter**

The helicopter pilot shall comply with the aeronautical requirements for helicopter operations and pilot standards of both the country of registration of the helicopter and the country where it is operating. The safety of the helicopter remains at all times the responsibility of the pilot.

### 11.3.2 Crew vessel required for helicopter landing operations



The precise composition of helideck crews required for offshore helideck operations is a matter for the Installation Dutyholder, MODU or vessel owner to decide. The primary objective is to ensure the safety of the helicopter passengers and crew, the helideck crew and the Installation, MODU or vessel. British Helicopter Advisory Board (BHAB) recommend a helideck crew comprising of an HLO to supervise the helideck operations plus three HDAs (in effect a monitor operator to give top cover plus two personnel to effect a rescue)

The Captain is responsible for the overall safety of the ship. He is assisted by 1 Officer. Clearance for any specific helicopter operation and permission for the helicopter to land onboard are at the Captain's discretion.

The Helicopter Landing Officer (HLO) is responsible for periodically inspecting and maintaining safety equipment reporting deficiencies to the Captain. The HLO shall make sure that emergency crews have received the appropriate training and drills are conducted to test crew readiness in the event of an emergency.

Prior to any helicopter operations, the HLO shall ensure:

- Emergency and fire fighting equipment ready to use.



- Operational readiness of the helideck.
- Passengers are briefed and understand this procedure.
- Passenger and freight documentation is completed.
- Control of personnel and freight on and near the helideck.
- Management of refuelling phases
- HLO shall also ensure radio contact with helicopter crew and/or radio operator

### 11.3.3 Passengers

All personnel shall wear appropriate PPE during helicopter operations:

- Ear defenders.
- Coveralls or Fire suits.
- Steel toe boots.
- Gloves (if handling cargo & luggage).
- Passengers – life jacket and immersion suits, if required.

Only designated personnel are allowed on the helideck.

### 11.4 Hazards

The following hazards can be expected during helicopter operations:

- Strong rotor downwash on takeoff and landing.
- Hot gases from exhaust and excessive noise.
- Main rotor blades can “droop” dangerously close to the deck on landing and when helicopter is being shut down.
- Tail rotor is high-speed propeller and, unlike the main rotor, is almost invisible when operating.

### 11.5 Safety Equipments

#### 11.5.1 Helideck requirements

Helicopter Operations shall comply with local requirements for reporting and authorization to fly.

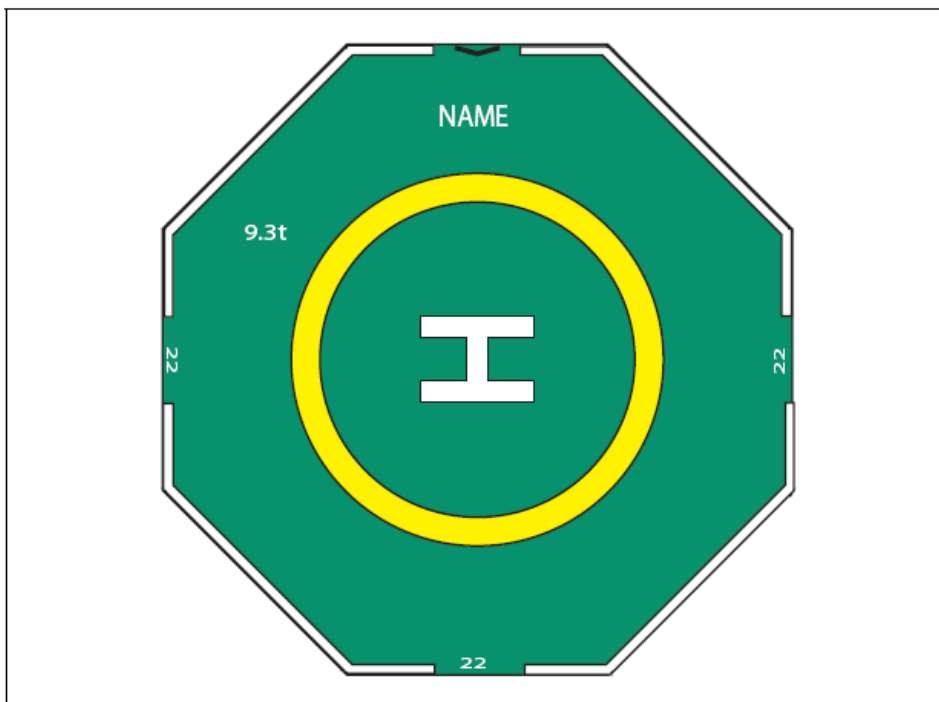
Certification requirements differ according to country and region. North Sea operations (UK, Dutch and Norwegian sectors) may allow certification to be carried from a neighbouring state. Operations Management shall ensure that appropriate certification has been granted for area of operation.

Helideck shall be painted dark green or grey with non-slip material added to the paint. Other markings are as follows:

- White “H” at the centre of the aiming circle.
- Aiming circle, clear zone and manoeuvring circle painted yellow at thickness of 20 centimetres.

- An obstacle free sector marked by a black chevron.
- High obstructions painted with yellow and black stripes.
- Vessel's name on or close to helideck and clearly visible from the air.
- Maximum take-off weight values indications as per local regulation

Drainage openings and scuppers on the perimeter of the helideck to be kept clear to prevent any build-up of surface water. All drains from the helideck shall discharge into the sea.



### 11.5.2 Fire-fighting equipment

The national authorities may request specific emergency equipment associated with the helideck. Such requirements should be met, but regardless of any national requirements, the following MINIMUM fire fighting equipment shall be provided, periodically maintained and available during any helicopter operation:

- At least two dry powder portable fire extinguishers with an aggregate capacity of 45 kg.
- Carbon dioxide extinguishers with an aggregate capacity of not less than 18 kg.
- Extinguishers shall be available near the helideck, but may be stored at sheltered locations to reduce exposure to the elements.
- Two sea water hydrants, with hoses capable of reaching extremities of the helideck.
- Foam application system (fixed or portable) capable of delivering a foam solution to the extremities of the helideck.
- Foam system may be part of an aft deck foam deluge system or may be provided by portable applicators connected to the fire hoses.
- Minimum of two fire blankets.



- Minimum of two fire suits.
- 2 breathing apparatus according to the minimum equipment list of the crash box + two reserve cylinders.
- One fireman's axe.
- One safety harness and fire-proof lifeline.

### 11.5.3 Emergency equipment (crash box)

The following equipment shall be stowed in a secure locker adjacent to the helideck and be available:

- An aircraft type axe.
- A large axe.
- A heavy duty hacksaw with blade.
- Two spare hacksaw blades.
- A grab hook.
- A quick release knife.
- A crowbar.
- A pair of 24 inch bolt croppers.
- Fire blankets.
- Wheel chocks.
- Set of screwdrivers.
- Side cutting pliers.
- Adjustable wrench.

### 11.6 Pre-flight preparation

Good communication is essential for safe helicopter / ship operations. Early contact between the Company and the helicopter operator shall include the following vessel information:

- Approximate area of operation of crew.
- Requested flight dates and timings.
- Anticipated status of the vessel: passage, anchored, shooting etc.
- Restrictions on manoeuvrability, I.E. speed with gear deployed, shooting directions etc.
- Vessel landing area: details of the certification, the "D" value, obstacle-free angle of the helideck and landing net type and size.
- Vessel's communications equipment (ability to monitor the aeronautical band of 118-136 MHz) and details of vessel's non-directional beacon (NDB) frequency code.
- Details of other installations in the area with NDB frequencies and codes.
- Details of any re-fuelling facilities in the area.



- Anticipated number of passengers, weight of baggage and freight, and freight type.

#### **11.6.1 Helicopter Operator provided information**

Helicopter type, weight and rotor length.

Operating frequency of the helicopter radio.

Helicopter call sign.

Estimated time of departure and arrival.

Instructions on whether or not a landing net is to be rigged.

Pitch, roll and heave limits of the helicopter

#### **11.6.2 Vessel Operator provided information**

##### **Vessel**

Position in degrees and minutes, block number, or relative position.

Speed and direction in knots and degrees from true north.

##### **Weather**

Wind speed and direction in knots and degrees from true north.

Cloud cover.

Air temperature.

Visibility in metres or nautical miles.

Sea state either in feet or Beaufort scale.

##### **Vessel motion**

Pitch in degrees either side of horizontal.

Roll in degrees either side of vertical.

Heave in metres.

##### **Loading**

Number of passengers.

Weight of passengers.

Baggage weight.

Freight weight.

Total weight.

#### **11.7 Procedural steps prior arrival of helicopter**

##### **11.7.1 Emergency readiness**

A state of emergency readiness shall be maintained during the following activities:

- Any landing or take off.



- Any time the helicopter is on deck with its rotor turning.
- Any engines start up.

A state of emergency readiness will include these minimum activities and precautions:

- Any assisting vessel (chase boat or guard ship) positioned in a safe but close proximity.
- Rescue craft made ready for launch and crew standing by with gear donned.
- Fire hoses lay out, fire main and foam systems pressurized.
- Portable extinguishers made ready.
- Two firemen dressed and ready (the total protection suit may be worn with hood and gloves ready for donning to reduce heat fatigue).
- Additional fire fighting equipment checked and immediately accessible.
- Emergency locker open and equipment checked and immediately accessible.
- Man overboard lifebuoys and raft adjacent to the helideck checked and free for immediate deployment.

#### 11.7.2 Passenger briefing

All passengers shall be given a briefing prior to boarding the aircraft. This may be written guidance and a verbal briefing by the HLO or by means of video material supplied by the helicopter operator. In the event of no video material being available for helicopter operations in general or the specific aircraft type and configuration to be used, then the following topics shall be covered as a minimum in the pre-flight briefing:

- Clear labelling of freight and luggage, name, address and destination.
- Restrictions on the carriage of certain article including as appropriate, lighter fuel, matches/gas lighters, aerosols, mercury thermometers, firearms and knives.
- Restrictions on the carriage and use of electrical items during the flight.
- Restrictions placed on the carriage of certain items as freight which are classified as dangerous goods, including:
  - Flammable liquids
  - Corrosives
  - Radioactive materials
  - Explosives
  - Poisons
  - Magnetic materials
  - Compressed gases
- Use of any immersion suit provided.
- Donning and use of the lifejackets.
- Emergency procedures to be followed on the helicopter.



- Position of and operation of emergency exits, life rafts and other safety equipment.
- Safety instruction card / information provided on the aircraft.
- Route and procedure to be followed whilst boarding the aircraft.
- Hazards presented by the rotors and down draught.
- No smoking.

#### **11.7.3 Prior to aircraft arrival (ETA – 30 minutes)**

Prior to helicopter departure from shore base (or 30 minutes before ETA if later), the HLO shall ensure:

- Helideck railings, aerials, stern mast or rigging anywhere near the operating area are lowered.
- Landing net (if used), laid out and secured, tension checked (it should not be possible to raise any part of the net by more than approximately 250 mmm above the deck surface when applying a vigorous vertical pull by hand).
- Pennant or wind sock hoisted (where it will be clearly seen by pilot).
- Ensure that all deck cranes are in the stowed positions.
- Helideck and the surrounding area are clear of obstructions and loose objects.
- Landing lights and floodlights operative
- Fire fighting and emergency equipment checked, connected and ready.
- Rescue/MOB craft ready for immediate launching.
- Crew in a state of readiness with gear donned.
- Radio check.
- Supporting vessel(s) are requested to "close-up" and "stand-by" for helicopter operations but outside of 210° sector.
- Passengers briefed and wearing appropriate immersions suits (if applicable) and life jackets.
- Snow / ice cleared (if applicable).

#### **11.7.4 Prior to aircraft arrival (ETA – 10 minutes)**

Start fire pumps and pressurize main hoses.

Fire team and freight handlers made ready.

Access to and exit from helideck/operating area cleared.

HLO to inform OOW vessel's readiness ('Green Deck').

OOW shall monitor assigned radio frequency for contact from the helicopter when in range.

OOW shall inform helicopter of vessel's present position, with speed and heading



### 11.7.5 Landing on vessel

Clearance to land shall be given to the helicopter pilot by the HLO (or through the OOW) after final checks are made and the deck party is ready.

### 11.7.6 Personnel and cargo

Example of boarding/disembarking procedures when rotors are turning: passengers may board or disembark either with the rotor in movement or with the rotor at standstill.

The pilot indicates the HLO the authorisation to approach by showing a thumbs-up.

The HLO then proceeds as follows:

- He approaches the helicopter either front-on or side-on 1.
- He hands over the passenger boarding list to the pilot.
- He opens the doors for the passengers disembarking, helps them recover their luggage from the hold and directs them away from the helisurface leaving by the front or side of the helicopter
- He collects the life jackets from the cabin and distributes them to the passengers boarding outside the helisurface
- He accompanies the passengers boarding, helps them install their luggage in the hold and closes it
- He ascertains that each passenger boarding has fastened his seat belt, then closes the doors.
- He requests confirmation from the pilot that the door closing lights have gone out, and returns to his position at the helisurface access point.
- He checks the helisurface is free of all obstacles and that no part of the helicopter is caught up in the net.
- He gives the pilot the thumbs-up signal or notifies him by radio that the helicopter may take off.
- Depending on the type of helicopter, this operation may be undertaken by the co-pilot

Unless the helicopter shuts down its engines, the vessel is to remain at standby status whilst the helicopter is on the helideck, with:

- Fire main pressurized, other fire fighting gear ready and fire squad in position.
- Rescue craft ready to be launched with crew standing by.
- Deck squad under supervision of HLO, to facilitate passenger and freight handling.

If the helicopter pilot shuts down the engines, the HLO shall ensure no one approaches the aircraft until the rotors have stopped turning. The flight crew shall be responsible to carry and use lashings for the aircraft. The HLO shall place himself in view of the pilot, in order to give and receive hand signals.

The following applies to personnel on the helideck:

- Nobody, unless directed by the HLO, shall approach the aircraft whilst the red anti-collision beacons are flashing.



- Always approach from the side or front in direct sight of the flight crew.
- Never wear any unsecured objects (hats).

The deck party shall keep clear of the helideck until the aircraft has landed and the pilot has indicated that it is safe to approach.

When required, chocks / sandbags maybe inserted under the main wheels after landing.

Passengers will disembarked (clear of helicopter danger areas), and freight unloaded under the supervision of the flight crew.

Under the supervision of the HLO and flight crew, all freight and baggage to be loaded (previously weighed and accompanied by documentation). 'Dangerous goods must be notified to the helicopter operator'.

If there is no flight attendant, the HLO should check that passengers are correctly strapped in.

The HLO shall ensure that the baggage and cargo are loaded securely and according to trim requirements as requested by flight crew.

All passengers and cargo will be detailed in the helicopter manifest. Two copies shall be given to the flight crew and one copy retained on board for the duration of the survey.

#### **11.7.7 Aircraft departure**

The HLO shall ensure that:

- Helideck cleared of all personnel except deck crew.
- Chocks removed when requested by pilot.
- All doors and hatches are closed and secured.
- Helideck is cleared and safety net does not interfere with the landing gear.
- Advise OOW and signal all clear to pilot by "thumbs up" sign with right arm fully extended.

#### **11.8 Emergency procedures**

The Air Operator and, where applicable, the Company should establish an emergency response plan using all the available resources in the event of an incident during the course of seismic operations.

ERP should include at a minimal the following:

- Established quick flow chart for downed/ditched aircraft, injured or lost personnel and Medevac callouts.
- Aircraft overdue.
- Loss of communications.
- Established procedures upon receiving a May-Day/distress transmission.
- Aircraft Accident/Ditched Aircraft.
- Establish procedures for precautionary landing, ie chip-light, hydraulic, low fuel.
- Medevac and SAR (Search and Rescue) Procedures.
- Means to coordinate with local emergency agencies on location response.



- Establish roles and responsibilities. (vessel crew,...)
- Emergency Response Procedures practice/drill.
- Hijack procedures.

This includes call-out procedures within the local aviation community and local emergency responders and shall also consider establishing a response team within the seismic crew in the event of a delayed response from local author.

The following is sufficient for most operations performed on board. Incidents with unusual hazards may require different or more specific response information:

- If necessary, activate the fire alarm to initiate an organized evacuation.
- Call designated numbers, from a safe location, to summon emergency response and communicate the nature of the emergency.
- If safe to do so, take measures to prevent the spread of the accident, e.g. turn off hazardous equipment or energy sources that could cause the situation to escalate.
- Send someone to meet the emergency responders. Do not assume that they can find you.
- Contact the Duty phone or any member of Emergency Response Team directly.

Report the incident to the appropriate line managers.

## 12. Marine Mammals Preservation

With regard to marine wildlife, Company as a member of OGP/IAGC abides by the principle of precaution toward conservation of all marine mammals, including seals, whales, dolphins and porpoises.

Therefore, in areas world-wide where these animals can be found, Company requests that Contractor applies mitigation measures during the seismic survey based on the procedures defined in the [JNCC Guidelines](#).

[JNCC Guidelines](#) could be used as the best practice and are mandatory for every survey performed in an area covered by JNCC legislation.

- “Look and Listen” at least *30 minutes* before beginning to fire the seismic source, and 60 minutes in water depths > 200 m
- Soft start (“ramping up or slow building up”) of the seismic source at least *20 minutes* before starting a line,
- Apply an exclusion zone around the source of *500 m* in radius,
- But acquisition to continue if Marine Mammals are entering the exclusion zone when the acquisition has already started,
- Recording forms should be filled in every time observations can be made in the survey area. Specific forms shall be used and a copy will also be included in the acquisition final report.

This minimum specification can be modified or superseded if required by local or regional regulations.



These guidelines aimed at minimising acoustic disturbance to marine mammals from seismic surveys and other operations where acoustic energy is released. Application of the guidelines is required under some licence conditions. However, member companies of the UK Offshore Operators Association (UKOOA) and the International Association of Geophysical Contractors (IAGC) have indicated that they will comply with these guidelines in all areas of the UK Continental Shelf (UKCS) and in some cases elsewhere. The guidelines apply to all marine mammals, including seals, whales, dolphins and porpoises. All surveys using higher energy seismic sources (including site surveys as well as large scale seismic surveys) should comply with these guidelines.

Seismic surveys at sea do not necessarily constitute a threat to marine mammals, if care is taken to avoid situations which could potentially harm the animals.

## 12.1 Planning stage

When a seismic survey is being planned, operators shall contact the Joint Nature Conservation Committee (JNCC – Dunnet House, 7 Thistle Place, Aberdeen, AB10 1UZ (fax. 01224 621488; e-mail [tasker\\_m@jncc.gov.uk](mailto:tasker_m@jncc.gov.uk)) and/or follow the advice resulting from the specific ESIA to determine the likelihood that marine mammals will be encountered.

In sensitive areas, the JNCC may request precautions in addition to those outlined below (for example, the special conditions attached to some oil and gas licences).

In areas which are important for marine mammals, operators shall seek to provide the most appropriately qualified and experienced personnel to act as marine mammal observers on board the seismic survey vessel. As a minimum, it is recommended that observers should have attended an appropriate training course.

If advised to do so by the JNCC, discuss the precautions which can be taken to reduce disturbance, and the design of any scientific studies with the Sea Mammal Research Unit. In areas where marine mammals are abundant, properly conducted observation and recordings using qualified observers carried out before, during and after the seismic survey, can provide valuable information on its effect.

## 12.2 Seismic survey

Modern large-scale surveys are conducted using towed arrays of "air-guns" - cylinders of compressed air. Each cylinder contains a small volume (typically between 10 and 100 cubic inches) at a pressure of about 2000 psi. The array, typically containing some tens of such cylinders, is discharged simultaneously, to generate a pressure pulse which travels downwards into the sea bed. Some of this acoustic energy is emitted into the wider marine environment; however, the designers of air-gun arrays seek to maximise the transmission of energy into the sea bed, with the result that the energy dissipated into the wider environment is reduced. As a survey proceeds, the air-gun array is recharged with air from a compressor on board the towing vessel. The process is repeated at intervals of approximately ten seconds - the timing dependent on the objectives of the survey.

### Potential effects of acoustic disturbance on cetaceans:

The most prevalent form of acoustic disturbance in UK waters is probably the noise generated by boats; however, the noise caused by boat traffic is so widespread that many cetacean populations may have become used to it, although this does not necessarily mean that the animals are unaffected. The limited research on the effects of disturbance due to the passage of

vessels shows there is some evidence that cetaceans will avoid approaching ships and may alter migration routes in response to marine traffic.

### 12.2.1 Potential effects

The extent to which seismic disturbance from airguns affects cetaceans is not well known for all species, since only a limited amount of research has been done. Most published research relates to the effect on large whales (particularly bowhead whales) of older air-gun arrays, which were different from those currently in use.

Seismic air-guns are designed to produce low frequency noise, generally below 200 Hz, used to build up a picture of the seabed and the underlying strata. However, recent research has shown that high frequency noise is also produced (Goold 1996a). Low frequency noise is more likely to disturb baleen whales than toothed dolphins; baleen whales communicate at frequencies mostly below 3 kHz, which are likely to overlap with the dominant frequencies used by seismic air-guns. The sensitivity of toothed dolphins to sound falls sharply below 1 kHz, and sounds below 0.2 kHz are probably inaudible to them. The sounds used by dolphins for communication are often above 4.8 kHz, and echolocation sounds can occur up to 200 kHz. Goold (1996a) found significant levels of energy across the recorded bandwidth up to 22 kHz. This high frequency noise, incidental to seismic operations, will overlap with the frequencies used by toothed dolphins, and could potentially cause disturbance. There is some evidence of disturbance of dolphins by seismic activity (Goold 1996b, Stone 1997, 1998).

Seismic activity could have a number of different effects on small cetaceans: it may interfere with communication or alter behaviour. In the worst case, there is some risk of physical damage in the immediate vicinity of air-guns. There is no evidence to suggest that injury has occurred to any cetacean in UK waters as a result of seismic activity, although such injuries may be difficult to detect. Seismic surveys may have indirect effects on local cetacean populations because of changes they may cause in the distribution of prey species.

The risk to cetaceans is increased by their natural inquisitiveness, and the fact that they may be attracted to areas of human activity where seismic surveying is about to take place.

### 12.2.2 Mitigation strategy

#### 12.2.2.1 Existing protection

Section 9 of the [WCA 1981](#) prohibits deliberate killing, injuring or disturbance of any cetacean (equivalent in Northern Ireland is Article 10 of the Wildlife Order 1985). This reflects the requirements of the [Bern Convention 1979](#) and Article 12 of the [Directive 92/43/EEC](#). This directive has been transposed into UK national laws by means of the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended), the Conservation (Natural Habitats, & c.) Regulations (Northern Ireland) 1995 (as amended) and the Offshore Marine Conservation (Natural Habitats & c.) Regulations 2007.

In addition, the UK is a signatory to the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas and has applied its provisions in all UK waters. Amongst other actions required to conserve and manage populations of small cetaceans, the Agreement requires range states to "work towards....the prevention of ...disturbance, especially of an acoustic nature".



### 12.2.2.2 Clues for detecting the presence of cetaceans

Even when quite close to vessels, cetaceans are often difficult to detect. The following points should help in ensuring that an adequate search has been made:

Seismic operators should allow adequate time (at least 30 minutes) for sightings to be made prior to commencement of any use of the seismic sources

The ease of detecting cetaceans declines with increasing sea state, so care should be taken to ensure an adequate search has been made in the prevailing conditions.

Searches should be made from a high vantage point with a clear all-round view, e.g. the bridge roof or crow's nest. If necessary use two or more vantage points to give an all-round view.

The sea should first be scanned slowly with the naked eye and then scanned slowly with binoculars.

Hydrophones are a useful aid to detecting cetaceans. Cetaceans communicate with each other using whistles, creaks, chirps and moans which may be heard over considerable distances. Trains of clicks are used for echolocation and while foraging. They may be heard with a hydrophone at distances of several kilometres. In areas which are known to be frequented by small cetaceans, any hydrophones used should be capable of receiving the high frequency sounds used by these animals.

Submerged cetaceans are much more at risk than those on the surface. This makes it particularly important to use a hydrophone whenever possible to detect vocally active animals that may be invisible from the surface.

Dolphins and porpoises generally surface 2-3 times per minute in order to breathe. Dive times and surfacing behaviour are more erratic when they are feeding, but most dives are unlikely to exceed 5 minutes. Large whales surface less often and may remain submerged for some time.

Splashes may be a clue to the presence of cetaceans, although in seas rougher than sea state 2 cetacean splashes may be difficult to detect and distinguish from wave splashes.

Blows of large whales may be more obvious, but still may be difficult to detect in strong winds.

Some species may be attracted to boats from some distance away, probably by engine noise. They may accompany a vessel for a considerable period and even bowride if it is fast-moving. If possible, look over the bow of the ship to check for cetaceans which may be hidden from view from the normal vantage points. The arrays of hydrophones which are towed by survey vessels may also be attractive to dolphins.

Feeding seabirds can sometimes be evidence of the presence of cetaceans. Species which are likely to associate with cetaceans include gannets, kittiwakes and Manx shearwaters, although any flock of birds should be checked for the possible presence of cetaceans.

An oily slick at the sea surface may signify the presence of cetaceans. These slicks may also be attractive to birds such as fulmars and storm petrels.

Cetaceans are capable of brief swimming speeds of 30 knots (34 mph), and sustained movement at 8 knots (10 mph), although some may swim at much slower speeds. If disturbed, they may alter their heading rapidly.

### 12.2.2.3 Guidelines

#### Pre-shooting search:

The pre-shooting search should be conducted over a period of 30 minutes before commencement of any use of the airguns. The MMO should make a visual assessment to determine if any marine mammals are within 500 metres of the centre of the airgun array. In deep waters (>200 m) the pre-shooting search should extend to 60 minutes due to the fact that deep diving species (e.g. sperm whale and beaked whale) are known to dive for longer than 30 minutes. A longer search time in such areas is likely to lead to a greater detection and tracking of deep diving marine mammals.

To facilitate more effective timing of proposed operations, the pre-shooting search can commence before the end of the survey line (whilst the airguns are still firing, however, still termed the 'pre-shooting search'); this condition may be necessary for surveys which have relatively fast turn times, or in deeper waters that require a 60 pre-shooting search. If a marine mammal is detected during the search, whilst airguns are still firing, there is no requirement to stop firing airguns; the MMO will advise to delay the commencement of the soft-start if they believe the marine mammal is likely to be within the mitigation zone when the airguns have stopped firing. If PAM is used in conjunction with visual monitoring the PAM operatives should ensure the system is deployed and being monitored for vocalisations during this time period.

**Delay if marine mammals within the mitigation zone (500 metres):** If marine mammals are seen within 500 metres of the centre of the airgun array during the pre-shooting search the soft-start of the seismic sources should be delayed until their passage, or the transit of the vessel, results in the marine mammals being more than 500 metres from the source. In both cases, there should be a 20 minute delay from the time of the last sighting within 500 metres to the commencement of the soft-start to determine if the animals have left the area. If PAM is used it is the responsibility of the PAM operatives to assess any acoustic detections and determine if there are likely to be marine mammals within 500 metres of the source. If the PAM operatives consider marine mammals are present within that range then the start of the operation should be delayed as outlined above. If marine mammals are detected within 500 metres of the centre of the airgun array whilst the airguns are firing, either during the soft-start procedure or whilst at full power, there is no requirement to stop firing the airguns. In situations where seal(s) are congregating around a drilling or production platform that is within the survey area, it is recommended that the soft-start should commence at a location at least 500 metres from the platform.

#### The soft-start:

Where equipment allows, the soft-start is defined as the time that airguns commence shooting till the time that full operational power is obtained. Power should be built up slowly from a low energy start-up (e.g. starting with the smallest airgun in the array and gradually adding in others) over at least 20 minutes to give adequate time for marine mammals to leave the area. This build up of power should occur in uniform stages to provide a constant increase in output. There should be a soft-start every time the airguns are used, the only exceptions being for certain types of airgun testing (see [JNCC Guidelines](#)), and the use of a 'mini-airgun' (single gun volume less than 10 cubic inches), these are used on site-surveys. The duration of the pre-shooting search (at least 30 minutes) and the soft-start procedure (at least 20 minutes) should be factored into the survey design. General advice to follow for soft-starts: To minimise additional noise in the marine environment, a soft-start (from commencement of soft-start to commencement of the line) should not be significantly longer than 20 minutes (for example,



soft-starts greater than 40 minutes are considered to be excessive, and an explanation should be provided within the MMO report).

Where possible, soft-starts should be planned so that they commence within daylight hours.

Once the soft-start has been performed and the airguns are at full power the survey line should start immediately. Operators should avoid unnecessary firing at full power before commencement of the line.

If, for any reason, firing of the airguns has stopped and not restarted for at least 10 minutes, then a pre-shooting search and 20 minute soft-start should be carried out (the requirement for a pre-watch only applies if there was no MMO on duty and observing at this time, and if the break in firing occurred during the hours of daylight). After any unplanned break in firing for less than 10 minutes the MMO should make a visual assessment for marine mammals (not a pre-shooting search) for marine mammals within 500 metres of the centre of the array. If a marine mammal is detected whilst the airguns are not firing the MMO should advise to delay commencement, as per the pre-shooting search, delay and soft start instructions above, if none are present then they can advise to commence firing the airguns.

When time-sharing, where two or more vessels are operating in adjacent areas and take turns to shoot to avoid causing seismic interference with each other, the soft-start and delay procedures for each vessel should be communicated to, and applied on, all the vessels involved in the survey.

### **Soft-start requirements for site survey or Vertical Seismic Profiling (VSP):**

Surveys should be planned so that whenever possible the soft-start procedures for site surveys and Vertical Seismic Profiles (VSP's) commence during daylight hours. Whilst it is appreciated that high resolution site surveys / VSP operations may produce lower acoustic output than 2D or 3D surveys it is still considered desirable to undertake a soft-start to allow for marine mammals to move away from the seismic source. For ultra high resolution site surveys that only use a 'mini-airgun' (single airgun with a volume of less than 10 cubic inches) there is no requirement to perform a soft-start, however, a pre-shooting search should still be conducted before its use. For site surveys and VSPs, a number of options are available to effect a soft-start.

The standard method where power is built up slowly from a low energy start-up (e.g. starting with the smallest airgun in the array and gradually adding in others) over at least 20 minutes to give adequate time for marine mammals to leave the vicinity.

As the relationship between acoustic output and pressure of the air contained in the airgun is close to linear and most site surveys / VSP operations use only a small number of airguns a soft-start can be achieved by slowly increasing the air pressure in 500 psi steps. From our understanding the minimum air pressure which the airgun array can be set to will vary, as this is dependent on the make and model of the airgun being used. The time from initial airgun start up to full power should be at least 20 minutes.

Over a minimum time period of 20 minutes the airguns should be fired at an increasing frequency (by decreasing the Shot Point Interval (SPI)) until the desired firing frequency is reached.

### **Soft-starts and airgun testing:**

Airgun tests may be required before a survey commences, or to test damaged or misfiring guns following repair, or to trial new arrays. Individual airguns, or the whole array may need testing, and the airguns may be tested at varying power levels. The following guidance is provided to clarify when a soft-start is required:



If the intention is to test all airguns at full power then a 20 minute soft-start is required.

If the intention is to test a single airgun on low power then a soft-start is not required.

If the intention is to test a single airgun, or a number of guns on high power, the airgun or airguns should be fired at lower power first, and the power then increased to the level of the required test; this should be carried out over a time period proportional to the number of guns being tested and ideally not exceed 20 minutes in duration.

MMOs should maintain a watch as outlined in the pre-shooting search guidance before any instances of gun testing.

### **Line Change:**

Seismic data is usually collected along predetermined survey lines. Line change is the term used to describe the activity of turning the vessel at the end of one line prior to commencement of the next line. Depending upon the type of seismic survey being undertaken the time for a line change can vary. Line changes are not necessary for all types of seismic surveys, for example in certain regional surveys where there is a significant distance between the lines, and are irrelevant for VSP operations. The guidance relating to line change depends upon the airgun volume.

Seismic surveys with an airgun volume of 500 cubic inches or more:

If the line change time is expected to be greater than 20 minutes, airguns should be terminated at the end of the line and a full 20 minute soft-start undertaken before the next line. A pre-shooting search should also be undertaken during the scheduled line change, and the soft-start delayed if marine mammals are seen within 500 metres of the centre of the array.

Seismic surveys with an airgun volume of 180 cubic inches or less (site surveys):

If the line change time is expected to be greater than 40 minutes, airgun firing should be terminated at the end of the line and a full 20 minute soft-start undertaken before the next line. The pre-shooting search should also be undertaken during the scheduled line change, and the soft-start delayed if marine mammals are seen within 500 metres of the centre of the airgun array. If the line change time is expected to be less than 40 minutes, airgun firing can continue during the turn, but the Shot Point Interval (SPI) should be increased (longer duration between shots). Ideally, the SPI should not exceed 5 minutes during the turn.

Depending upon the duration of the line turns and the nature of seismic survey it may be necessary to vary the soft-start procedures. If an applicant determines that an effective line change cannot be achieved using the above methods please contact JNCC at the earliest possible opportunity to discuss the proposed alternative, and include the details of the agreed procedure and the consultation with the JNCC in the application for survey consent.

### **Undershoot operations:**

During an undershoot operation, one vessel is employed to tow the seismic source and a second vessel used to tow the hydrophone array, although the main vessel will still tow the hydrophone array. This procedure is used to facilitate shooting under platforms or other obstructions. The MMO may be too far away from the airguns to effectively monitor the mitigation zone, and it is therefore recommended to place the MMO on the source vessel. If this is not possible, for example for logistical reasons, or the health and safety implications of transferring personnel from one vessel to another, the application should explain that the recommended procedure cannot be followed in the application for the survey consent, or the application for a variation of that consent. Irrespective of the MMO location agreed with the

pre-shooting search and soft-start procedures should still be followed prior to undertaking an undershoot operation.

### 12.2.3 Acoustic Monitoring

Visual observation is an ineffective mitigation measure during periods of darkness or poor visibility (such as fog), or during periods when the sea state is not conducive to visual mitigation, as it will not be possible to detect marine mammals in the vicinity of airgun sources. Under such conditions, PAM is considered to be the only available mitigation technique that can be used to detect marine mammals. Current PAM systems can be particularly helpful in detecting harbour porpoises within the 500 metre mitigation zone, although the systems have their limitations and can only be used to detect vocalising species of marine mammals. PAM systems consist of hydrophones that are deployed into the water column, and the detected sounds are processed using specialised software. PAM operatives are needed to set up and deploy the equipment and to interpret the detected sounds.

PAM can provide a useful supplement to visual observations undertaken by MMOs and JNCC may recommend that it is used as a mitigation tool when commenting on applications for survey consents. However, in many cases it is not as accurate as visual observation for determining range, and this will mean that the mitigation zone will reflect the range accuracy of the system. For example, if the range accuracy of a system is estimated at  $\pm 300$  metres, animals detected and calculated to be within 500 metres from the source could, in reality, be  $500 + 300 = 800$  metres, but their detection would still lead to a delay in the soft-start. Although, at present it is not possible to express the range accuracy of most PAM systems in numerical terms, this example serves to illustrate that it is in the operator's best interests to use the most accurate system available, and for the PAM operative to factor in a realistic estimate of the range accuracy. Some PAM systems do not have a reliable range determination facility or can only calculate the range for some species. In such cases, the detection of a confirmed cetacean vocalisation should still be used to initiate postponement of the soft-start if the PAM operator is to make a judgement about the range of the marine mammal from the airgun source, because of their experience gained in differentiating between distant and close vocalisations. In the absence of PAM systems capable of range determination, this expert judgement will constitute the basis for deciding whether an area is free from cetaceans prior to the soft-start. In all cases where PAM is employed, a brief description of the system and an explanation of how the applicant intends to deploy PAM to greatest effect should be included in the application for survey consent. In the last few years, software that processes and analyses cetacean sounds has been developed. PAMGuard is open source software that has been developed as part of the International Association of Oil and Gas Producers Joint Industry Project (JIP).

### 12.2.4 Report

A report detailing marine mammals sighted (standard forms are available from JNCC), the methods used to detect them, problems encountered, and any other comments will help increase our knowledge and allow us to improve these guidelines. Reports should include the following information (Marine Mammal Recording Forms are available in Appendix 2):

- Date and location of survey.
- Number and volume of airguns used.
- Nature of air-gun discharge frequency (in Hz), intensity (in dB re.  $1\mu\text{Pa}$  or bar metres) and firing interval (seconds), or details of other acoustic energy used.

- Number and types of vessels involved in the survey.
- A record of all occasions when the air-guns were used, including the watch beforehand and the duration of the soft-start (using standard forms).
- Details of any problems encountered during marine mammal detection procedures, or during the survey.
- Marine mammal sightings (using standard forms).
- Details of watches made for marine mammals and the seismic activity during watches (using standard forms).
- Reports from any observers on board.

## 13. Occupational Health and Medical care

### 13.1 Worksite environment

Following fields of action shall be addressed by Contractor before operations and means of control and recovery documented and available at worksite:

- Noise: noise analysis shall be performed at each noisy work site. Ambient noise, average noise and peak noise shall be monitored in dB (A) following a noise analysis method.
- Hot/Cold climates: as per local occupational health regulation, working temperature indoor must be controlled within comfort range, depending on exposure duration and air moisture (kitchens, workshops, tent based workshops, offices...). Outdoor working temperature cannot be controlled, but must be monitored to adapt work and rest periods and adapted clothing and PPE(s). Prevention and proactive measures shall be proposed by Contractor wherever identified as significant hazard. Rest periods, PPE(s), limitation of exposed people and efficient Medevac plan are main basement. Working in a hot/cold environment shall respect the specifications of **GS EP MED 063**. In addition, please refer to **OGP Report N°398**.
- Stress at work to be taken into account (long work hitches, high expected production, security threat, poor entertainment, work conditions, living conditions...).
- Task monotony and break periods to be assessed.
- Lighting: lighting shall be adapted to activity such as meticulous work (as in cable repair), office work, work on computer, kitchen work...
- Ergonomics: all existing and new worksites shall be designed with due consideration to basic ergonomic parameters such as above mentioned once, and body positions (seats, standing up), repeated movements, loads, handles locations, information location (screen, gauge...), task monotony and break periods, etc.
- Worked hours: balance between worked hours and rest/sleeping time.
- Rest periods (holidays): duration of work periods on the crew and holidays adapted to local regulation.
- Entertaining and communication to family: entertainment on the crew is recommended. Exercising and TV are recommended. Wherever applicable, Contractor should make easier communication between employees and family.



- Quality, quantity, temperature and variety of food shall be controlled by crew Doctor and catering department.

As a supplement to points above, refer to **GS EP MED 062**.

### 13.2 Company Health Standards

Medical personnel and crew management shall be aware of local and international laws and regulations concerning medical support on sites.

Medical and first aid facilities (clinic, equipment, drug,...), evacuation capabilities, presence of the Doctor, the hygiene aspects shall respect the specifications of **GS EP MED 060**, **GS EP MED 061**, **GS EP MED 062** and **GS EP MED 063**.

Contractor shall demonstrate evidence of a medical fitness control policy and shall be responsible for its implementation. Contractor shall perform all relevant assessments to ensure that Contractor's Personnel involved in the SERVICES is medically fit for the job it is assigned to. Medical certificates shall be made available to Company upon request.

An initial state of local (or regional) medical support in place including planned Medevac facilities (local hospital, clinic, victim transportation means: ambulance, aircraft, etc.) shall be conducted by the Contractor's and/or Company's medical staff prior to the start of the work (according to the Company's standards in that case).

Contractor shall be responsible for providing medical services and first aid facilities as mentions in **OGP Report N° 343** for all Contractor's and Subcontractor's personnel employed on the survey unit for the performance of the work. Contractor shall also provide such services and facilities for Company's personnel.

Contractor shall authorize Company to perform at any time audits of Contractor's medical services and first aid facilities.

First-Aid kits shall be placed in all vessels, small boats, galleys, workshops. Kits shall be inspected and replaced as needed by the Medical staff (refer to **GS EP MED 061**).

In order to comply with Company's policy on the prevention of asbestos hazards, Contractor shall provide proof from an independent certified inspection organisation that no asbestos or suspected presence exists on any craft involved in the operations.

Smoking policy shall be aimed at minimising the adverse safety and health effects, including social effects, of tobacco smoke and designate communal non-smoking areas.

A substance abuse policy shall be implemented by the CONTRATOR.

#### 13.2.1 Job description for medical personnel

Please refer to **GS EP MED 061** § 3.

#### 13.2.2 Medical Emergency Plans

Please refer to **GS EP MED 061** § 8.

##### 13.2.2.1 Medical transportation

Please refer to **GS EP MED 061** § 4.



### 13.2.2.2 Transporting contagious patients

Please refer to **GS EP MED 061** § 8.2.4.

### 13.2.2.3 Emergency First Aid training requirements

Please refer to **GS EP MED 061** § 6.

Information concerning the particularities of tropical environments is given to all personnel who are to stay in tropical countries both when preparing for the journey and during the stay. It shall include information on:

- Malaria, how it is transmitted, the prophylactic measures to be taken.
- Infectious diseases (transmitted sexually, and vector-borne, water-borne, food-borne or air-borne diseases).
- Hygiene in tropical environments.

### 13.2.3 Medical structure and equipment

#### Construction and layout

Please refer to **GS EP MED 060** § 4.

#### Specific Equipments and furniture

Please refer to **GS EP MED 061** § 5.

## 14. Environment

Company Environmental Standards and Concerns are of the utmost importance. Contractor must strictly obey to the Local Environmental Laws and Regulations, the IAGC and OGP recommendations, the **MARPOL** regulations and the Contract requirements.

Where required by the local Law, and the Company policies and/or by the local Environmental Authorities, an "Environmental Base Line Study" (EBS) and/or an "Environmental and Societal Impact Assessment" (ESIA) have been preliminary conducted by Company. Copies of the EIA will be provided to Contractor who will be required to strictly observe the ESIA recommendations.

In all cases, Company considers environment preservation as first priority before production. Contractor has to refer to preliminary EBS/ESIA conclusions for EMP implementation.

To minimize the consequences of any spill, SOPEP procedure and SOPEP kits shall be available onboard the vessels. Personnel shall be trained to use such equipment and conducted regular drills.

### 14.1 Waste Management

Prefer biodegradable material when possible.

Do efforts to reduce the material consumption.

MSDS (Materiel Safety Data Sheet) of all material available on work site.

Wastes are to be segregated.



Contractor to provide a waste management plan to Company before operation start. The management plan shall address all waste types produced by the seismic crew and Sub-Contractors and method(s) of disposal for each material/type including all hazardous material as mechanic or medical.

WMP (Waste Management Plan) shall include waste reduction plan and targets.

Biodegradable waste to be burnt or buried according to local laws.

Non biodegradable waste (metal, wood, rubber, tyres, plastic, ...) to be segregated as well as hazardous waste (medical, batteries, acid, spray paint, contaminated soil, waste oil...).

Non biodegradable waste and hazardous waste to be delivered to local facilities if possible and applicable re-cycled.

Waste disposal log to be kept up to date.

Monthly amount of waste produced to be included in the HSE monthly report.

## 14.2 Water Management

Measure taken to reduce water consumption (ie: automatic taps).

Water consumption monitored.

Procedure for grey and black waters disposal management and/or treatment implemented.

## 14.3 Environment, Fauna, Flora and History

Respect of local resources is mandatory.

Harassing wild life is forbidden.

Fishing is forbidden.

Feeding wildlife is forbidden.

All kind of flora is to be respected.

Noise map is to be done onboard ships/vessels.

Follow the latest applicable [JNCC Guidelines](#) for Marine Mammals protection as minimum specification, unless otherwise dictated by local regulation (source ramping up, exclusion zone etc.).

In sensitive areas the Contractor shall have to show evidences of identification, preservation procedures and reporting ones concerning: preserved sites, protected areas and/or any particular sites (such as: geological curiosities, fossils, dinosaur remains, etc.) encountered during the operations.

All sensitive areas encountered during the operation shall be reported to the Company representative.

Every recognized site is to be respected by the crew personnel.

Hazardous material spills are to be reported.

Hazardous materials are to be isolated from water bodies.

Environmental Emergency Response Plan is to be implemented.



## 14.4 Societal issue

Operations' effects on/from third parties and environment shall be taken into account.

Any press release referring to the operation or Contractor's involvement in Company's activities shall be agreed upon by Contractor and Company's legal and communication department prior to release.

## 15. Onshore transport

Please refer to **GS EP GPA 202**, chapter 7.

## 16. Security

### 16.1 Summary of security management policy

The General Manager of the Company subsidiary shall approve the organization and the subsequent plans.

This organization has the following basic goals:

- Help the Company developing a Security Plan to ensure protection of the lives of all persons involved in the seismic operations and effectively reduce loss of assets due to criminality and other factors by ensuring the application and "building-in" of all relevant security guidelines and directives at all phases of the operations.
- Develop measures to ensure that the application of security requirements by the Company, the Company personnel, Contractors and Contractor personnel, Sub-Contractors and Sub-Contractors personnel alike are in agreement with the overall seismic operations deliverables within the framework of the General Corporate and seismic operations specific security aspirations and Respect for Human Rights.
- Ensure compliance with all applicable International and National Security Regulations.

These goals are achievable through:

- Identifying all security tasks for all seismic operations phases with clear assignment of responsibilities and time frames in cooperation with the Company,
- Developing early warning systems in concert with E&P security to ensure that seismic operations personnel receive the relevant security advice for all seismic operations locations,
- Increase awareness of all seismic operations personnel for personal security and knowledge of general seismic operations security requirements,

and by :

- Respect of the National laws and regulations and security policies for every seismic operations location,
- Respect of **ISPS Code** for the vessels involved in the seismic operation and submit to the Code. Implementation of the Code and dedicated Plan on the survey area,
- Respect of relevant supplementary International Rules and Regulations including as a minimum the Voluntary Principles on Security and Human Rights (VPSHR),
- Ensuring adoption of all relevant Corporate security guidelines and specifications,



- Ensuring that seismic operations security activities are in phase with the subsidiary goals.

While realising that the security of personnel and assets on a Contractor worksite is the primary responsibility of the Contractor, the Company shall ensure that differences arising from the Company recommendations and Contractor security practices are solved through the issuance of relevant Bridging Documents stating the procedures to address such differences. The Bridging Documents shall clearly outline the definition of responsibilities for security.

Such Bridging Documents shall be approved by the General Manager of the Company subsidiary in liaison with Total E&P Security Department.

## 16.2 Security management process

In order to address the specific threats listed above, a comprehensive security approach is to be processed throughout the preparation and conduct of seismic operations.

### 16.2.1 Responsibilities

Three levels of responsibility are considered: Country national authorities, Company, and Contractor.

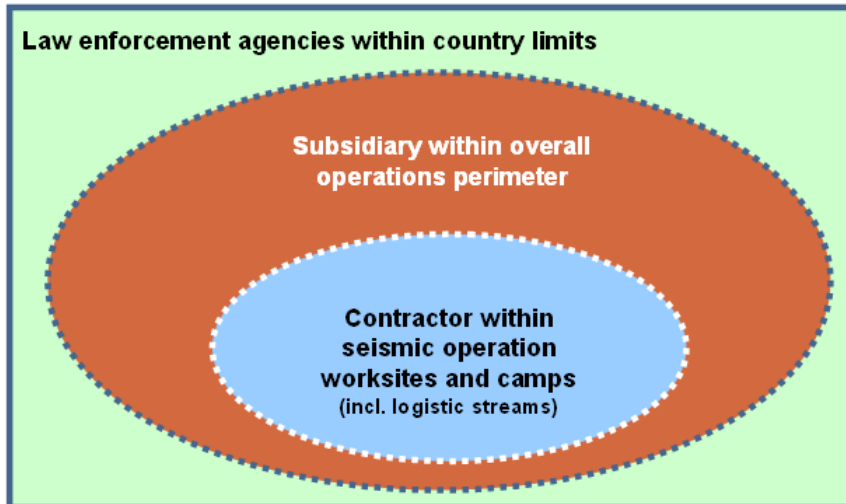
1. The National Authority ensures the general security of seismic operations area, thus allowing freedom of work and movement. Conditions of security assistance of national agencies towards the Company are organised and implemented by the Company directing management. Security policies and procedures are implemented in accordance with the Universal Declaration of Human Rights, with the international and National laws and with the Voluntary Principles on Security and Human Rights.
2. The **Company** overlooks the seismic operations security perimeter with C2i function (control, coordination and information). The Company liaises with the seismic operations supervisor/manager in order to control and supervise the Contractor security arrangements and liaises with the National Authority for all issues related with security of the seismic operations.
3. **Contractor** is responsible for the execution of the seismic operations and therefore ensures the development of the Seismic Operations Security Plan, the control, supervision and integration of Subcontractors security plans (if applicable) and the development and maintenance of appropriate security measures at all owned or operated locations where Corporate, Company subsidiary or seismic operations personnel have activities or have personnel supervising activities.

Contractor has to organise the security within their perimeter of activity such as camps, yards and transportation between the locations of different sites of work. Contractor has to issue and to implement their security plan taking into account the Company Security Standards. This plan has to be submitted to the Company subsidiary's General Manager.

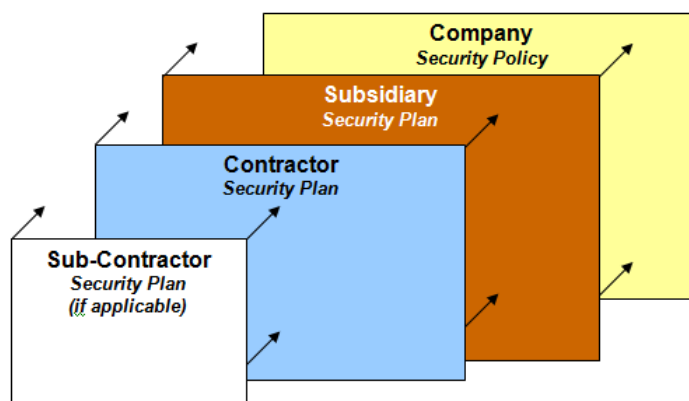
The ability of Contractors to endorse this responsibility should be a primary requirement in the award of contracts.

**The organization of seismic operations security is described by a Seismic Operations Security Plan, which is to be integrated in the Company Security Plan.**

## Perimeters of responsibility



## Integration of security plans



### 16.2.2 Security of employees

The following principle shall be respected: "The security and protection of employees must be the overriding priority of all business activity".

Throughout the seismic operations, security of lives and protection of well-being of personnel shall be a primary goal. Adequate procedures and control measures shall be put in place to achieve this goal.

These shall include the following actions as a minimum:

- Ensure the development and maintenance of adequate personnel protection procedures and measures at all locations where the Company and Contractor will have permanent activities or have Corporate personnel supervising activities,
- Develop and maintain adequate personnel-on-board (POB) databases for all seismic operations locations,



- Ensure the existence of facilities to achieve the Corporate Security recommendations for personnel evacuation,
- Develop and maintain adequate Site Emergency Response and Crisis Management plans.

#### **16.2.2.1 Corporated owned and/or operated sites**

For the Company owned and/or operated sites, the Company shall be responsible for taking seismic operations personnel into account in the POB and evacuation procedures and other emergency response measures.

Contractor shall be responsible for ensuring the security of their personnel during transfer from their point of entry into the country to the Corporate operated site.

#### **16.2.2.2 Contractor operated sites**

Contractor sites shall have and shall maintain an up-to-date personnel security and evacuation plan covering, as well as their own personnel, all TOTAL Corporate and subsidiary personnel. In situations where the Contractor may not be able to manage the required logistics for such an effort, the Contractor has to develop a minimum plan that shall ensure the Security of the personnel until such time as the Company can safely and securely evacuate the personnel from the Contractor site or develop plans that shall enable the Contractor to safely and securely deliver the personnel to a pre-identified the Company evacuation point.

Contractor shall provide a dedicated security plan for the Company's Subsidiary approval for all operated sites where personnel are permanently assigned and accommodated or where personnel are present for temporary assignments or short term spot visits. This Contractor security plan shall be developed accordingly and regularly updated and may be audited by the Company at commencement of work on the site.

#### **16.2.3 Respect for human rights**

The following principle shall be respected: "Security policies and procedures must be implemented according to the Universal Declaration of Human Rights, the international and national laws, and the Voluntary Principles on Security and Human Rights. Respect for human dignity is paramount at all times."

The Company and Contractor subscribe to the Voluntary Principles on Security and Human Rights. Guarantees to ensure that the Human Rights are respected shall be enforced through:

- Developing awareness of VPSHR and requirements for seismic operations personnel and Contractors through the Company organised awareness and SG/DSG directives,
- Ensuring that the seismic operations activities are in phase with the Corporate VPSHR implementation action plan,
- Development of conflict management procedures by Contractor and Sub-Contrator (if applicable),
- Inclusion of riots and crowd management procedures in security plans,
- Ensuring that community related issues are captured in global HSE and sustainable development efforts that relate to the seismic operations (This is in realisation of the fact that community related actions/protests generally impact security and human rights issues),



- Ensuring clear definitions in the deployment and use of security forces (see below).

All security procedures and practices that are developed during the seismic operations shall ensure that respect for human rights is sustained. The possible impact of all security related seismic operations activities shall be carefully identified and appraised in order to be mitigated as fast as possible.

#### **16.2.4 Security responsibilities**

The following principle shall be respected: "Line management must be continually aware of and take responsibility for the security aspects of its business activities. Security organisation and resources must reflect this commitment."

Contractor and all persons on the seismic operations shall be made aware of and fully understand the individual and group responsibilities to ensure his/her personal security. To ensure this, a Security Induction shall be implemented on the seismic operations. This Security Induction shall include:

- Awareness of basic requirements to ensure individual security,
- Security of Corporate and the subsidiary assets and information,
- Security implications of his/her action on other Corporate and the Company personnel and image.

This security awareness/induction shall be organised for each seismic operations person already on the operations as well as all new entrants.

##### **16.2.4.1 The company's subsidiary general manager**

- Provides the necessary management support to ensure the effective implementation of Security for the seismic operations. He checks and approves Company and Contractor Security plans. He is in charge of the implementation of agreements/arrangements with the National Authority regarding security of the operations, including commitment to VPSHR considerations,
- Appoints a Security Coordinator (recruitment to be approved by Total Corporate Security) to implement the Operations Security Plan,
- With support and assistance of DGEP/HSE/SEC, defines a structure for security organisation, including the different security forces deployed for the seismic operations protection,

To report any security issues to DGEP/HSE/SEC and Corporate Security Division.

##### **16.2.4.2 Security Coordinator for seismic operations**

The Company's Subsidiary Security Coordinator for seismic operations directly manages the Security content of the seismic operations. His principal tasks shall include:

- First line approval of all Security related documents and activities in the seismic operations,
- Ensures coherence of Security requirements with seismic operations security plan,
- Manages interfaces between Security with other operational managers,



- Informs the Company's Subsidiary General Manager of the current local Security levels, status of travel restrictions,
- Provides feedback on other Security issues to the Company's Subsidiary General Manager.

The Company's Subsidiary Security Coordinator for seismic operations shall also provide advice and assistance on Security issues across the complete spectrum of the seismic operations by:

- Issuing and implementing Security Plan for the seismic operations in close coordination with DGEP/HSE/SEC,
- Liaising with DGEP/HSE/SEC for all issues related to Security Plan and procedures,
- Identifying International and National Security requirements that impact the seismic operations,
- Ensure that the mines and UXO(Unexploded Ordnance) threat is thoroughly addressed through due assessment and mine-clearing operations,
- Liaising with DGEP/HSE/SEC for follow-up of Corporate and Security recommendations,
- Notifying the Company's Subsidiary HSE Manager of any restrictions for travel/missions to seismic operations locations,
- To report security issues including incident and near miss to the Company's Subsidiary General Management,
- Controlling the update of the seismic operations personnel-on-board information with Contractor,
- Providing seismic operations personnel with specialist security advice and support,
- Providing Contractor with the threat assessments issued by Corporate Security,
- Preparing and reviewing the security aspects of future tender documentation and Contractor selection,
- Auditing and reviewing the security activities of seismic operations Contractors,
- To ensure that where armed security guards are used on the Company or Contractors sites, the National rules of engagement (RoE) are displayed and known by everybody. These rules must be clear and should not contain any ambiguous instructions for the use of force. RoE must stipulate when and how force can be use. The RoE must:
  - Respect human dignity and human rights of all persons,
  - Give priority to non-violent means first. Force is used only when necessary,
  - Use only the minimum force required that should be proportional to the threat.
- To ensure that none of the security measures is oppressive towards members of local communities,
- To identify international and national security requirements that will impact the seismic operations,
- To interface between Contractor and National Authorities regarding dedicated protection provided by local Army,

- In case of local Army deployment, to make sure that all armed personnel deployed for the seismic operations protection are trained and briefed on their mission, the VPSHR and the RoE,
- To assist, support and control Contractor for the implementation of a Seismic Operations Security Plan,
- To coordinate rescue and evacuation plans for the whole seismic operations perimeter of activity,
- In liaison with DGEP/HSE/SEC, to provide Contractor with guidance for the design of security and the specification of security equipments throughout the seismic operations different phases,
- To follow up the situation where the Contractor activities are carried out and to provide threat assessments throughout the different phases of the seismic operations, to adjust the level of alert accordingly and to provide recommendations and directions to Contractor regarding security,
- To integrate this Seismic Operations Security Plan in the Company security plan,
- To liaise and coordinate with the Country authorities. It is emphasised that the Company is the only mandated level of coordination for issues related to the overall seismic operations,
- To control security organisation and security procedures of Contractor,
- To audit regularly the security organisation of the seismic operations.

#### **16.2.4.3 Seismic operations personnel**

Seismic Operations personnel shall abide by Security recommendations relating to the seismic operations activities as well as regulations and guidelines guiding Security behaviour while on Corporate official assignment.

#### **16.2.4.4 Contractor's security responsibilities**

Each Contractor has the responsibility and duty to ensure that all Security aspects/requirements within his area of activity are properly identified, assessed and implemented in accordance with the Company's Subsidiary security plan and requirements. Contractor is also to take responsibility for the actions of their Sub-Contractors.

Contractor shall be required to produce and maintain their own Security Plan and dedicated site bridging documents which shall document the Security procedures, processes, studies and activities which shall be undertaken to comply with the requirements of this Security Plan especially for sites where Corporate will have personnel on a permanent basis.

The development of this Security Plan shall require that the Contractor nominates/dedicates senior specialist in his organisation to manage the Security resources of the Site and where necessary seek the advice of the Company's Subsidiary Security Coordinator.

Contractor shall ensure its personnel and activities comply with all Corporate and International recommendations in its area of activity, participate in and abide by recommendations of Security audits.



#### 16.2.4.5 Control and coordination with sub-contractors

Each Sub-Contractor is liable for making its own security arrangements under the supervision and responsibility of the Contractor. The organization of that control and coordination system is part of the contractor's security plan.

#### 16.2.5 Security prevention priority

The following principle shall be respected: **“Prevention must be the first priority. Threats analysis and risk evaluation should be carried out on a continuous basis.”**

One of the primary goals of Security requirements is to ensure that the risks to personnel and assets are as low as reasonably practicable. In order to meet this goal, assessment of Security risks shall be continuously undertaken throughout the design process and shall continue throughout the remaining life of the seismic operations.

In order to meet these goals, Security management tools such as Security studies shall be carried out during the different seismic operations phases. Security risk assessments shall be regularly carried out with input from DGEP/HSE/SEC for the different seismic operations locations especially where Corporate personnel will be based, or where the Corporate will intend to carry out permanent activities.

##### 16.2.5.1 Security Management Tools

Throughout all seismic operations phases, a number of key Security Management tools are utilised. These shall include:

- The Company's Subsidiary and Contractor's Security plans:

The Seismic Operations Security Organization is presented herein, a Seismic Operations Security Plan has to be developed accordingly. Contractor shall maintain a Security plan for any site where Corporate, subsidiary and Contractor personnel are permanently assigned or accommodated. These plans shall be submitted to the Company for comment and approval. Where substantial differences exist between Contractor Security practices and the Company recommendations, these shall be itemised and a bridging document issued to address them.

- Security reporting:

Security activities undertaken on each site under the Company recording perimeter shall be reported. Lessons learnt as well as status of implementation of Security action plans shall also be captured. Serious security related events have to be reported immediately.

- Security audits:

The Company shall maintain Security audit tools which shall be used for audits to measure compliance with recommended preventive actions and where necessary develop remedial action plans to complement the risk assessment action plans.

- Risk Assessment:

The Company shall ensure that Security risks for every seismic operations phase are periodically analysed. Where necessary, expert advice on Security assessment models and resources will be sought from SG/DSG. The use of Company and seismic operations personnel in each work location will be subject to the requirements of the SG/DSG recommendation for country level risk analysis. Adequate arrangements shall be implemented to ensure the Security of personnel on missions or permanently present in work locations and accommodations.



### 16.2.6 Security preparedness

The following principle shall be respected: **“Preparedness is essential to mitigate incidents rapidly and effectively. Response plans must be developed and tested to deal with assessed risks.”**

#### 16.2.6.1 Seismic operations general security arrangements

Security preparedness involves a deliberate effort to ensure that all security requirements are captured, put in time lines and responsibilities assigned. The global Security Management system is handled by this document.

Security travel advisory services shall be put in place by the Company and be accessible to all Contractor personnel on request. This analyses the security conditions of the locations where the seismic operations are being carried out and apply the proper SG/DSG recommendations.

#### 16.2.6.2 Evacuation and emergency planning

Majority of the work to be carried out on onshore sites shall be on Contractor locations.

Contractors shall develop evacuation or shut-down plans to manage cases of evacuation resulting from security crises in their sites. The Company shall ensure that the Contractors evacuation plans are capable of handling evacuation of both Contractor and Company employees.

Where Contractor and Company personnel are present on Contractor locations and evaluation has shown that the Contractor lacks the resources to provide safe evacuation, the Contractor shall produce a bridging document showing that additional resources and plans are in place to:

- ensure the safety of the Contractor and Company personnel on its site until such time as the local subsidiary is able to safely and securely evacuate the personnel,

or

- safely and securely move the Contractor and Company personnel to a place of safety or a Company location.

This plan shall include a provision to provide on a daily basis, the name and location of any Contractor and Company personnel working or accommodated on site. The extent of the information given will depend on the local conditions and area security level.

These evacuation plans shall be approved by the Company.

#### 16.2.6.3 Drills and Exercises

Periodic drills and exercises shall be organised for sites. Drills and exercises shall be organised with the objective to test response of all persons and action groups in emergencies.

Each Contractor shall maintain the details of drills and exercises as well as schedules for the site as part of the general Security Plan.

### 16.2.7 Validation of security measures

The following principle shall be respected: **“Security measures and procedures must be submitted to regular inspections, validations and verifications by security specialists so as to maintain high levels of security standards in TOTAL Operations worldwide.”**



### 16.2.7.1 Inspections and Audits

Security audits shall be carried out for all key areas of the seismic operations. A program of internal Security audits shall be proposed by each Contractor within the Contractor's Security Plan and submitted to the Company's Subsidiary for review and inclusion into the specific bridging document.

To ensure that the relevant Company recommendations for Security protection of personnel and assets are followed and enforced on the site to generate early warning systems and instigate the necessary remediation measures, Contractor shall develop and maintain an appropriate audit ranking document especially for sites where Contractor or Company will have permanent presence or a number of personnel.

### 16.2.8 Professionalism, knowledge and staff integrity

The following principle shall be respected: **"The level of professionalism, knowledge and integrity of staff involved in security matters on behalf of TOTAL must be tightly controlled and exemplary. Appropriate training plans, recruitment and contracting procedures must be established and implemented."**

Security awareness training shall be vigorously pursued during all seismic operations phases and activities. All persons shall be made aware of the minimum Security requirements relating to individual Security, knowledge of Security regulations and Security of Corporate and Company assets and image.

The Company's Subsidiary Security Coordinator shall develop a Security training content to the seismic operations personnel to impact the required staff knowledge and assure integrity of persons.

General Security information and guidelines shall be developed showing the basic knowledge of Security behaviour for personnel. Relevant country specific advisory in form of pocket booklets may be distributed to Contractor staff.

### 16.2.9 Incident reporting

The following principle shall be respected: **"All incidents, including security breaches and irregularities must be reported and recorded. Corrective action should be taken and followed up through the regular verifications to improve the overall security standard."**

All Security incidents and occurrences relating to seismic operations activities shall be reported.

All incidents involving Security forces shall be both immediately reported and formally documented in the Contractor Incident Report database.

All incidents/actions in violation of this procedure shall be investigated and appropriate sanctions imposed for each defaulter. Where proven cases of abuse exist by a Security agent, the Company's Subsidiary shall take efforts to ensure that the Security agent is removed from the seismic operations.

The Contractor has the responsibility to ensure that appropriate incident reporting forms exist on site. Each reported incident shall be investigated and proper reports forwarded by the responsible Contractor Security person on site to the Company's Subsidiary Security Coordinator.

The Company's Subsidiary reserves the right to carry out its own investigation into incidents or verify the reports received from the site. In this case, the Contractor and its personnel shall

cooperate fully and shall provide all facilities and assistance necessary to complete the investigation.

#### 16.2.10 Use of security forces

The following principle shall be respected: **“Generally security forces used by TOTAL are non-armed guards. However if no other alternative exists to properly manage the risk, armed guards could be used within the scope of legally and governmentally approved practices. Armed guards must be selected carefully, trained regularly and supervised closely”**

The use of Security forces shall be guided by the following basic actions, in accordance with Corporate policies.

##### 16.2.10.1 Define a structure for Security organisation

A structure shall be defined for Security organisation showing the different Security Forces used and the responsibilities for each.

The Security organisation for each Contractor site where Contractor or Company will have permanent personnel shall be defined. This structure shall show all the different personnel that make up the Security team and ensure that all Security personnel fully understand their roles and responsibilities, and that such understanding is based on structured rehearsal.

##### 16.2.10.2 Define the process of requesting and deployment of Security forces

The Security forces to be used at all phases of the seismic operations and for the affected sites should be selected to ensure that individuals with past criminal records are not recruited. Where Government Security forces are to be used, their activities shall be monitored to ensure that they respect applicable national laws and regulations.

The Company's Subsidiary shall implement control mechanisms and eliminate all actions that may blemish the image/reputation of the Company. The Company's Subsidiary shall ensure that the coordination of Security forces on their site is in line with applicable national regulations. The Company's Subsidiary shall ensure too that training programmes, induction and bridging instructions will be developed, updated and administered to security forces at the beginning of their assignment where lapses are found to exist.

##### 16.2.10.3 Define rules of engagement

Where armed Security personnel are used on Company or Contractor sites, the national rules of engagement and site guidance containing clear and unambiguous instructions for the use of force by the security forces must be maintained on the site. This instruction shall stipulate when and how force may be used and that specifically they must:

- respect human dignity and the human rights of all persons,
- attempt non-violent means first; only use force as a final resort,
- use only the minimum force required, and keep it proportional to the threat,
- operate strictly within the law and the authority given to them to use force,
- minimise damage and injury,
- be told that they will be accountable for any excessive use of force.



Security forces shall be issued with pocket-sized cards detailing the requirements for the use of force.

#### 16.2.10.4 Use of firearms on the premises

As a general rule, Company and Contractor employees are not allowed to bear firearms while on the Company and Contractor premises or operated sites. The carriage and use of firearms is restricted to law enforcement authorities and armed forces, who will have been issued with the relevant rules of engagement and guidelines on use of force.

#### 16.2.10.5 Security forces operations

While it may not be possible to list every scenario, the basic principle for all phases of the seismic operations and applicable sites is that threat scenarios or situations that arise shall be estimated by combining the aggressors' capability and intent with the possibility that their actions will:

- endanger life,
- damage equipment, shut down operation or cause other financial loss,
- prevent free access or egress of persons and goods,
- damage the Corporate reputation.

In every case, Contractor shall concentrate the security efforts on protecting Contractor and Company personnel and property and shall ensure that the security forces are acting accordingly. These guards shall be made fully aware of what they are to protect, and the manner in which they are to protect it, in line with the applicable regulations in particular that force should be used only when strictly necessary and to an extent proportional to the threat.

Contractors for sites where Company or Contractor will have a permanent presence shall develop and maintain similar instructions as part of their security plan.

#### 16.2.10.6 Impact of security measures on local communities

The following principle shall be respected: **“Mindful of the need to introduce security measures to protect its employees and local personnel, TOTAL nonetheless makes every effort to minimise the impact of these measures on local communities.”**

The security measures to be adopted for the seismic operations shall have the primary goal of protecting personnel and assets. No security measure shall be implemented with the goal of intimidating or harassing local communities.

Activities of security forces shall be routinely monitored to ensure that this objective is adhered to. Where a security measure is identified to be oppressive to innocent members of local communities, efforts shall be made to modify that security measure and remove the unwanted aspects.

Contractor shall be encouraged to maintain cordial relationships with the local communities and abide by this regulation.

### 16.3 Information Security

Contractor shall maintain, in separate locations, duplicate files in either hard copy or electronic format of all project correspondence and documents, including electronic data and information.



These files shall be maintained in a current state and in a fireproof environment. Contractor shall provide for Company's review its Document and Information Security System.

Contractor's Procedures shall include the following:

- Identification of areas of exposure,
- Methodology for classifying Confidential Information,
- Methodology for handling, securing, storage, restriction of access, and disposal of confidential information provided by Company, Contractor, and third parties,
- Requirement for a written confidentiality agreement between Contractor and third parties prior to release of Confidential Information,
- Methodology for ensuring that all employees having access to Confidential/Restricted information are obliged by an employment contract to honour the confidentiality requirements of the contract,
- Segregation of Company's Confidential/Restricted Information from information belonging to Contractor or received from others by Contractor,
- Implementation of computer security controls and protection of electronic information.

#### **16.4 Contractors security quick evaluation questionnaire**

##### **Organisation:**

- Does the Contractor have a security policy?
- Does the Contractor have a Security Manager?
- Are site or subsidiary employees familiar with his/her role?
- Does the Security Manager report directly to the General Manager?
- Is there a written reporting procedure for security events?
- Are there any procedures for the selection and the appointment of security firms?
- Is there a written reporting procedure for near-misses to help the Contractor anticipate a deteriorating situation and inform the Corporate?
- Is the Contractor and its Security Manager familiar with the Group/subsidiary security policy and how to implement it?
- Does the Contractor have a business continuity plan (BCP)?

##### **Staff security:**

- Does the Contractor have an emergency response plan (risk assessment, emergency communications, emergency response, stand-fast and evacuation, etc.)?  
When were these procedures last tested?
- Does the Contractor maintain an up-to-date list of employees including those on business travel and visiting family?
- Are there written procedures on the reception of visiting and/or rotational staff?  
Are these procedures applied in the field?
- Are security inductions organized?



### Reputation issues:

- Does the Contractor use armed guards?
- If so, is there a procedure for checking what training they have received?
- Are the Contractor and its Security Manager familiar with the *Voluntary Principles On Security and Human Rights* and ensure that they are applied?
- Does the Contractor have regular contacts with the local authorities?
- Has the Contractor established selection procedures for the appointment of security firms?
- Has the Contractor set up a monitoring system to anticipate events that could tarnish its Corporate image (communications, legal services, etc.)?

### Site Security:

- This is an overview, refer to separate questionnaire for specific site security issues if necessary.
- Has a plan for protection against hostile acts been drawn up for sensitive sites? At the very least, does it include access control procedures?
- Do facilities subject to the ISPS code have a valid certificate of compliance with the provisions of the code?
- If the site is responsible for a pipeline, is it covered by a security plan?

### Information Security:

- Does the Contractor have implemented and communicated basic rules for information security (offices) and ensure they are applied?  
(Such as wear a badge at all times and ensure it is visible, systematically escort visitors to and from reception, lock all lockers and offices every time you leave even briefly, protect sensitive information by encryption, locked cabinets or double envelope system, shred all sensitive material,...)
- Is the Contractor management aware of the need for information security?
- Are the computers of key personnel equipped with an encryption software?
- Are the laptops used outside Contractor premises equipped with an encryption software?  
Is data encrypted?

### IT Security:

- Industrial computer systems:

Is the Contractor familiar with the Industrial Network Security briefing and are the recommendations applied?

Does the Contractor employ a consultant Industrial IT manager who is not a member of staff?

Is the industrial IT network protected by a special barrier?

Are there procedures for managing industrial IT systems?



- Intranet Site (if the Contractor has developed an Intranet site):

Are there written procedures for setting up local intranet sites and are they part of detailed specifications that include security and information protection ?

Are there procedures for managing the confidentiality and content of information published on the intranet?

Are there procedures for checking what type of information is accessible on the intranet sites of the Contractor facilities?

Are there procedures for managing the closure of an intranet site with a view to protecting the information published on the site?

## 17. Night working procedure

There are no additional restrictions for night time operations but all vessels should be made aware that:

- Some surface installations may not be fully lit,
- A sharp lookout should be kept for unlit dugout canoes.

## 18. Diving operations

It is important to inform divers when a seismic survey occurs in the vicinity of a diving zone.

When seismic survey is conducted in the vicinity of diving activities, the safe distance between the seismic source and divers shall be 1 500 meters, when source is airgun or gas gun type and its capacity is not greater than 4 400 cubic inches or equivalent.

The psychological effect of a seismic source shot upon a diver in the water could be significant.



## Appendix 1 Personal Protective Equipment

|                                                     |                                                                                                                                                                                                                        |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cooks and assistants                                | 100% cotton white uniform – anti-slipping safety toe shoes – paper hats or caps                                                                                                                                        |
| Waiters                                             | 100% cotton shirt and trouser – anti-slipping safety toe shoes                                                                                                                                                         |
| Mechanics                                           | 100% cotton overall – helmet – goggles – strong gloves – safety shoes                                                                                                                                                  |
| Welder                                              | 100 % cotton overall with long sleeves – leather welding gloves – leather apron – safety shoes – black goggles or mask                                                                                                 |
| Grinder                                             | 100% cotton overall with long sleeves – leather – safety shoes – safety glasses – face shield – ear protection – cap, woollen hat or bandana                                                                           |
| Electrician                                         | 100% cotton overall – helmet – goggles – strong gloves – safety shoes – electrician high voltage gloves                                                                                                                |
| Crane operator / helper                             | 100% cotton overall – helmet – goggles – strong gloves – safety shoes                                                                                                                                                  |
| Batteries handler                                   | 100% cotton long sleeves overalls – rubber gloves – goggles–safety shoes                                                                                                                                               |
| Painter / compressed air operator                   | 100% cotton overall with long sleeves – cap – dust mask – goggles – safety shoes                                                                                                                                       |
| Helicopter Landing Officer (HLO)                    | 100% cotton overall with long sleeves – helmet with shine strap or canoeist type and with VHF radio integrated ear protection – gloves – eye protection – reflective vest with 'Helicopter Landing Officer' marking.   |
| Helideck Assistant (HDA)                            | 100 % cotton overall with long sleeves – helmet with shine strap or canoeist type – gloves – eye protection – reflective vest with 'Helideck Assistant' marking.                                                       |
| Helicopter passenger                                | Survival suit (when applicable) – lifejacket – ear protection.                                                                                                                                                         |
| Boat pilot (FRC, work boat)                         | 100% cotton overall with long sleeves – immersion suit (when applicable) – life jacket – anti slipping shoes – canoeist type helmets – dead-man switch (when relevant) – eye protection or sunglass if needed – gloves |
| For water body areas and for all boats passengers   | 100% cotton overall with long sleeves – immersion suit (when applicable) – life jacket – anti slipping shoes – canoeist type helmets – eye protection or sunglass if needed – gloves                                   |
| For working on back deck during deployment/recovery | 100% cotton overall with long sleeves – helmet – eye protection – strong gloves – safety glasses – life jacket – harness/inertia reel – anti slipping shoes                                                            |
| For working at height                               | Approved industry harness, lanyard, carabiners, inertia reels.                                                                                                                                                         |
| For working in confined spaces                      | Approved industry breathing apparatus.                                                                                                                                                                                 |
| For rainy areas                                     | Poncho, raincoat or waterproof wet weather clothing, rubber boots for field personnel                                                                                                                                  |
| For hot and sunny areas                             | Caps, straw hats provided to field personnel. Good quality sun glasses provided to the drivers and field personnel                                                                                                     |



## Appendix 2 Marine Mammals Recording Forms

### Marine Mammal Recording Form - Location and Effort Data

Ship .....Ship type (seismic/guard etc.)

Observer(s) .....Survey type (site, 2D, 3D etc.)

Please record the following information every day, regardless of whether marine mammals are seen or not.

| Date | Block number | Number of daylight hours during which a watch for marine mammals was kept | Length of time seismic guns were shooting during the watch | Wind force (Beaufort) and direction | Sea state<br>Choose from:<br>G = glassy<br>S = slight<br>C = choppy<br>R = rough | Swell<br>Choose from:<br>O = low<br>M = medium<br>L = large | Visibility<br>Choose from:<br>P = poor<br>M = moderate<br>G = good |
|------|--------------|---------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|
|      |              |                                                                           |                                                            |                                     |                                                                                  |                                                             |                                                                    |
|      |              |                                                                           |                                                            |                                     |                                                                                  |                                                             |                                                                    |
|      |              |                                                                           |                                                            |                                     |                                                                                  |                                                             |                                                                    |
|      |              |                                                                           |                                                            |                                     |                                                                                  |                                                             |                                                                    |
|      |              |                                                                           |                                                            |                                     |                                                                                  |                                                             |                                                                    |



## Marine Mammals Recording Form - Record of Operations

Ship: ..... Company: ..... Contractor: .....

Complete this form every time the airguns are used, whether for shooting a line or for testing or for any other purpose. Times should be in GMT.

| Date | Who carried out a search for marine mammals?<br>(Job title) | Time when pre-shooting search for marine mammals began | Time when search for marine mammals ended | Were hydro-phones used? | Were marine mammals seen before the airguns began firing? | Time when marine mammals were last seen | Was there any reason why marine mammals may not have been seen?<br>(e.g. swell, fog, etc.) | If marine mammals were present, what action was taken?<br>(e.g. delay shooting) | Time when soft start began | Time when airguns reached full power | Time when airguns stopped |
|------|-------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------|-------------------------|-----------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------|--------------------------------------|---------------------------|
|      |                                                             |                                                        |                                           |                         |                                                           |                                         |                                                                                            |                                                                                 |                            |                                      |                           |
|      |                                                             |                                                        |                                           |                         |                                                           |                                         |                                                                                            |                                                                                 |                            |                                      |                           |
|      |                                                             |                                                        |                                           |                         |                                                           |                                         |                                                                                            |                                                                                 |                            |                                      |                           |
|      |                                                             |                                                        |                                           |                         |                                                           |                                         |                                                                                            |                                                                                 |                            |                                      |                           |
|      |                                                             |                                                        |                                           |                         |                                                           |                                         |                                                                                            |                                                                                 |                            |                                      |                           |
|      |                                                             |                                                        |                                           |                         |                                                           |                                         |                                                                                            |                                                                                 |                            |                                      |                           |
|      |                                                             |                                                        |                                           |                         |                                                           |                                         |                                                                                            |                                                                                 |                            |                                      |                           |



## Marine Mammals Recording Form - Record of Sighting

Options *in italics* should be circled or underlined as appropriate

|                                                                                                                                                                                                                                                                    |                                 |                                                                                                                                                             |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Date:                                                                                                                                                                                                                                                              |                                 | Time:<br>(GMT)                                                                                                                                              |  |
| How did this sighting occur? (please tick box)<br>While you were keeping a continuous watch for marine mammals <input type="checkbox"/><br>Spotted incidentally by you or someone else <input type="checkbox"/><br>Other (please specify) <input type="checkbox"/> |                                 |                                                                                                                                                             |  |
| Ship:                                                                                                                                                                                                                                                              |                                 | Observer:                                                                                                                                                   |  |
| Ship's position (latitude and longitude):                                                                                                                                                                                                                          |                                 | Water depth (metres):                                                                                                                                       |  |
| Species:                                                                                                                                                                                                                                                           |                                 | Certainty of identification:<br><br><i>Definite/probable/possible</i>                                                                                       |  |
| Total number:                                                                                                                                                                                                                                                      |                                 | Number of adults:<br><br>Number of juveniles:                                                                                                               |  |
| Description (includes features such as overall size; shape of head; colour and pattern; size, shape and position of dorsal fin; height, direction and shape of blow):                                                                                              |                                 | Photograph or video taken:<br>Yes/No                                                                                                                        |  |
|                                                                                                                                                                                                                                                                    |                                 | Direction of travel of animals in relation to ship (draw arrow):<br><br> |  |
| Behaviour                                                                                                                                                                                                                                                          |                                 | Direction of travel of animals (compass points):                                                                                                            |  |
| Activity of ship:                                                                                                                                                                                                                                                  | Airguns firing:<br><br>Yes / No | Closest distance of animals from airguns (metres):<br><br>(Record even if not firing)                                                                       |  |