



SBU Offshore HSEMS Manual



Managing risks together



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Revisions

Date	Version	Comments
10-2002	6	Re-drafted in full
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01 - 2004	8	Update of MOPO – Update onboard organization chart-update of training matrix
01-2005	9	Update organization chart
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Approval

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0 INTRODUCTION

0.1 PURPOSE AND SCOPE OF THE HSE-MS MANUAL

This manual provides a full description of the CGG Offshore SBU Health, Safety and environmental Management System (HSEMS).

CGG Offshore further believes that safe operations can be achieved through the pro-active management of risk. The purpose of the HSEMS is to provide a system for continuously identifying and controlling hazards and risks that may arise through any aspect of the company's operations. CGG Offshore recognise that their operations may have an impact on the health of personnel or on the environment as well as on safety, and management of these matters is included in the HSEMS.

The HSEMS sets out the system for management of HSE on CGG Offshore seismic acquisition operations. Because of the structure of the company, the system requires the co-operation of all contractors engaged in or in support of such operations. This HSEMS is not designed to replace contractors own systems, but to provide a structure for managing HSE across the multi-company operations typical of CGG Offshore's *modus operandi*.

0.2 COMPANY BACKGROUND AND OPERATING METHODS

Compagnie Générale de Géophysique, the French Geophysical Company, established in 1931, is a seismic contractor with agencies worldwide. CGG's activities focus on acquisition and processing of seismic data, for both land and marine geophysical operations.

The CGG Offshore SBU is the entity managing the Offshore Seismic Acquisition within CGG through CGG Marine and Multiwave. A third branch of the Offshore SBU relates to the Marketing of Non exclusive Marine Seismic Data through its subsidiary CGG Multi Clients based in Houston.

CGG Marine, a subsidiary set up in 1996 is based in Massy, in the Paris region, and has several agencies in the world.

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CGG Marine operates world wide for all major oil and gas exploration companies. At the time of writing the fleet consists of several, fully equipped advanced 3-D acquisition vessels assisted by long-term hired escort vessels. All of the ships are equipped with streamers, a data recording system and integrated navigation system and data processing system.

Multiwave , a subsidiary based in Bergen is the Centre of competence for 4C and 2D within CGG.

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It is the operational centre for vessel management of the 2D fleet, as well as the vessels used for seabed operations.

Within the CGG group, Multiwave is the research and development centre for 4C and seafloor operations, with strong links to the Bergen Research and development community.

Multiwave has cascaded its own policies and QHSE Manual fully consistent with CGG Offshore and CGG Group Policies and QHSE Manuals. Where the general instructions and guidelines set out in this Manual do fully apply in Multiwave, specific issues are adjusted within Multiwave with regards to the specific nature of their Operations to cover their own HSE Processes.

0.3 GENERAL DESCRIPTION OF THE HSEMS

0.3.1 Overview of the Health, Safety and Environmental Management System (HSEMS)

From a health, safety and environmental (HSE) viewpoint, a survey can be viewed as a partnership between parties with shared goals. These parties may include the Client, suppliers, and contractors, and the full participation of all is necessary to achieve safe operations.

Safe operations in the field depend on an effective system operating at all levels, both away from and at the work site.

This HSEMS describes how HSE is managed in CGG Offshore and includes how CGG Offshore manages its contractors and suppliers.

The CGG Offshore system is designed to link with the Client and contractor HSE management system, and CGG Offshore recognise the importance of interfacing with such systems in a manner, which provides a seamless structure for managing individual projects. The corner stone is the link between its HSEMS and the HSEMS of its marine management. Different bridging HSE statements are established with our maritime operators.

0.3.2 HSEMS components

The management of HSE is based on the same principles as management of quality, these being:

- Setting objectives;
- Providing a system to realise the objectives;
- Process approach;
- Defining performance standards;
- Monitoring performance.

To address all of these objectives, the CGG Offshore HSEMS is based on a structure with 8 key elements and 12 processes shown on Figure 1 : CGG Offshore HSE Processes (compliant with industry standards).

Health Safety Environmental Management System - HSEMS



Generic Process	Health, Safety and Environment - HSE	
Sub Systems	Health - HEH	
	Environment - ENT	
Permanent Processes	Human Resources HUR	Documentation DON
	Operation Processes	
	Emergency Response EMR	Human Behaviour HUB
	Helicopter Operations HEO	Vehicles VES
	Seismic Operations SEO	Vessel Operations VEO
		Security SEY

Figure 1 : CGG Offshore HSE Processes

0.3.3 HSEMS and Quality Management System

CGG Offshore applies two management systems, each with its own field of action. The HSE Management System is a sub-system of the Quality Management System. The HSEMS describes the procedures for carrying out the production with due regard to health and safety and the protection of the environment. The Quality System organises such production in such way as to continuously improve Quality. The establishing of HSE processes is a pre-requisite of Quality ones.

0.3.4 HSEMS Manual document reviews

Any modifications to the HSEMS Manual are reviewed by the QHSE Manager and are included in a draft version of the manual. The Executive Vice President of CGG Offshore SBU approves the manual.

Distribution of the amended version is done through the company web site or other appropriate means.

0.3.5 CGG group's HSE policies & objectives

CGG Group's General Management has defined and written up its HSE policies, as well as basic documents, which therefore must apply to all product lines.

The various documents in force are as follows:

- **The CGG Group HSE Policies:** These are declaration of intent by the CGG Group President expressing the Group's commitment as well as the assigned objectives. The Policies are distributed to the entire Group staff
- **The CGG Group Annual HSE Objectives:** These objectives are settled and revisited once a year. CGG Offshore HSE objectives are in line with these ones.
- **CGG Group HSE Procedures:** These documents are for general purpose and are adapted at the level of each Business Unit. The measures of CGG Offshore's HSE Management System are established with due observance of these procedures.

☞ ***Annex A CGG Group HSE Policy***

☞ ***Annex B: CGG Group HSE Objectives***

☞ ***Annex C: CGG Group Environment Policy***

☞ ***Annex D: CGG Group Drug & Alcohol Policy***

☞ ***Annex E: CGG Group Smoking Policy***

1 LEADERSHIP AND COMMITMENT

The Executive Vice President and Senior Management of CGG Offshore SBU undertake to provide strong and visible leadership and are committed to providing the resources necessary to develop, operate and maintain the HSEMS in accordance with the corporate HSE policies and objectives. The management ensures that full account is taken of HSE policy requirements and provides full support for local actions to protect health, safety and the environment.

CGG Offshore believe that safe operations depend on a company-wide culture that supports the objectives and methods described in the HSEMS, based on:

- desire to achieve the highest possible standards of HSE performance,
- motivation to continuously improve HSE performance,
- acceptance of individual responsibility and accountability for HSE performance,
- participation and involvement at all levels in HSEMS development,
- commitment to an effective HSEMS.

CGG Offshore is committed to and supports a culture that:

- promotes a healthy lifestyle amongst all its employees,
- develops safety awareness and responsibility at all levels,
- protects the environment.

Employees of both CGG Offshore and its contractors shall be involved in the creation and maintenance of such a supportive culture.

To achieve this culture the Executive Vice President and Senior Management of CGG Offshore SBU undertake to:

- include HSE as an integral part of business planning,
- allocate the necessary time and financial resources to HSE matters,
- set a personal example in day-to-day work,
- meet regularly at all management levels to discuss and review HSE matters and performance,
- be actively involved in HSE activities and reviews, at both local and remote sites,
- define objectives and standards,
- recognise performance when objectives are achieved,
- encourage by acting swiftly on employees' suggestions for measures to improve HSE performance,
- ensure good communication throughout the company and with contractors,
- keep up to date on HSE law, and industry guidelines, trends and initiatives,
- participate in internal and external initiatives.

CGG OFFSHORE shall take all necessary HSE precautions related to and arising out of the performance of a seismic contract in order to protect the environment and personnel and property of CGG OFFSHORE, the Client, the contractors and all third parties.

In addition to the above, leadership and commitment is further demonstrated by:

- emphasising plans for achieving HSE objectives and participating in their execution,

- nominating high potential key personnel, experienced and competent with a high level of HSE awareness and consciousness, to develop and maintain the HSEMS,
- regular crew visits and conducting HSE audits and inspections,
- participating in accident/incident investigation,
- communicating with subcontractors on HSE matters,
- receiving and acting on HSE reports and holding HSE review and analysis sessions.

CGG OFFSHORE ensures that all the personnel under its control and authority (i.e. including subcontractors) are briefed and understand CGG OFFSHORE and Client policies on Health consideration, Safety prevention and Environmental protection, and act accordingly.

CGG OFFSHORE takes all necessary precautions to reduce as reasonably as possible risks to health and safety, and to protect the environment. This includes respect to all international (ex: MARPOL) and local government regulations, IAGC and OGP (ex E&P Forum) guidelines.

Local customs, cultural and religious requirements are respected, avoiding challenge, contradiction and/or criticism thereof.

More specifically for environment, CGG OFFSHORE prevents the collection, removal, purchase and utilisation directly or indirectly of local environmentally protected resources, including plants, animals, antique artefacts etc, for consumption, profit or any other purpose by its own personnel or subcontractors' personnel.

2 POLICY AND STRATEGIC OBJECTIVES

This section addresses the CGG Offshore intentions, principles of action and aspirations with respect to health, safety and environment and the aim of improved HSE performance.

These are specified within the CGG Offshore SBU (strategic Business Unit) Policies and Objectives that apply to all entities within CGG Offshore SBU.

The HSEMS policies are created:

- to establish procedures to reduce the risks and hazards to health, safety and the environment of its activities to levels which are as low as reasonably practicable,
- to define practical means for taking into account and minimising the impact of our activities,
- to train our personnel in Health and Safety prevention and protection of the Environment before and during all types of activity.

To analyse performance against these policies, adequate objectives are associated and monitored.

The HSE policies and strategic objectives are broadly disseminated. All employees understand the CGG corporate and CGG Offshore HSE policies and strategic objectives and these are on display within the company premises in prominent locations.

2.1 HSE POLICY

The CGG Offshore SBU¹ is committed to continuously promote and perform services worldwide while protecting the people and the environment in which they work and live.

HSE is part of our business culture and we believe that striving to continuously improve our HSE Performance is key to our business success.

We believe that all accidents, industry related illnesses and losses can be prevented.

We recognize the importance of reducing risks and we plan and perform our activities ensuring risks are assessed, controlled and kept as low as reasonably practicable.

To implement this Policy we will :

- Provide strong, visible commitment, leadership and personal involvement in HSE.
- Define the organisational responsibilities and make available the resources necessary to achieve our HSE objectives.
- Comply with applicable laws and regulations while aspiring to higher standards.
- Strive for Best in Class HSE training for all employees.
- Encourage sound HSE behaviour through dedicated awareness programs.
- Perform comprehensive risk assessment to reduce HSE risks and mitigate the impact of operations on HSE matters.
- Manage suppliers and contractors to ensure that their products and services meet applicable HSE standards.
- Ensure active participation from all employees through performance reviews, incidents reporting and inspections.
- Actively participate in Industry Initiatives.
- Monitor our performance and take actions to address deficiencies.

- Conduct Audits and reviews to verify the effectiveness of the HSE Management System.

 **Annex C: CGG Offshore HSE Policy**

2.2 DRUG & ALCOHOL POLICY

CGG Offshore recognises that the consumption of prohibited drugs and alcohol and other intoxicants can have a detrimental effect on the health and safety of individuals and co-workers.

All employees are expected to be in a suitable mental and physical condition to perform their duties in a satisfactory manner and to behave appropriately. They must also be in a fit condition at all times to be able to deal with any emergency situation which may arise.

It is prohibited to be under the influence of alcohol and drugs for all CGG Offshore people and subcontractors, from the time of boarding any vessel. Therefore, alcohol and drug consumption is strictly prohibited on board vessels involved in CGG Offshore operations.

An individual test for drugs or alcohol may be decided by CGG Offshore, in compliance with local law and regulations:

- When an employee is obviously under the influence of alcohol or drugs ;
- When an employee is involved in an accident.

With a view to preventing casualties, CGG Offshore reserves also the right, subject to local laws and regulations, to carry out :

- An individual test on employees with a potentially sensitive job function, prior to the start of operations ;
- Some random testing.

Where appropriate, CGG Offshore will assist individuals in dealing with drugs and alcohol-related issues.

 **Annex D: CGG Offshore Drug and Alcohol Policy**

2.3 SMOKING POLICY

CGG Offshore considers that smoking is not only harmful to health, but also represents a potential safety hazard.

CGG Offshore therefore requests its personnel to ensure that the following regulations are respected :

- Smoking is strictly prohibited on hazardous work sites where there is a risk of explosion or fire. In such places, « No Smoking » signs must be clearly posted ;
- Smoking is also prohibited inside premises and is therefore only allowed in designated places outside premises in open deck areas where “Smoking Area” signs will be posted and specific ashtrays (fixed and closed) provided. In all other areas (corridors, mess rooms, cabins, control rooms, lounges, etc) prominent “No Smoking” signs should be posted.

Furthermore, CGG Offshore encourages its personnel not to smoke, will inform them about the negative effects of smoking on health and do its best to assist personnel who smoke and wish to give up the habit.

 **Annex E: CGG Offshore Smoking Policy**

2.4 STOP WORK POLICY

CGG Offshore recognizes that the responsibility for HSE performance starts with the individuals. Each individual contracted or subcontracted by CGG is responsible for his own health, his safety and the safety of anybody around him.

In virtue of this principle, any worker may stop any task in any of the following circumstances:

- The task to be carried out contradicts CGG HSE policies.
- The method of carrying out the task contradicts CGG HSE procedures.
- The worker is not aware of the HSE procedures to carry out a particular task.
- The worker faces a serious and imminent hazard.

Any worker has the right and obligation to stop work that is unsafe.

If a worker feels entitled to implement his right to stop work in the above-mentioned circumstances, he must immediately inform his direct supervisor, so that corrective steps are taken and the work may resume.

 **Annex F: CGG Offshore Stop Work Policy**

2.5 WORKBOAT POLICY

CGG Offshore recognizes the risk associated with the utilization of workboats deployed from seismic vessels.

This operation is nevertheless today essential to efficient offshore streamer seismic acquisition.

CGG Offshore will work to reduce the exposure of personnel involved in workboat operations by reducing the need for interventions, targeting the scope of workboat usage, increase training and experience sharing, promote HSE awareness and behavior, and develop risk assessment.

CGG Offshore policy is:

- To give priority to durability, reliability, immunity to environmental aggression, and user friendliness of possible repair or replacement at sea, in the selection of equipment,
- To develop preventive maintenance of towed equipment making benefit of planned recoveries,
- To promote the efficient use of workboat to change or repair equipment at sea in the best possible safety conditions,
- To strictly restrict the use of workboats for any other utilization through anticipation and validation of alternative solutions,


- To associate maritime expertise through the establishment of a strong partnership with ship managers for the design, maintenance, and navigation of workboats and construction of associated procedures based on share of experience,
- To actively participate in all initiatives within the industry related to improvement of safety of the workboat operations.

 **Annex G: CGG Offshore Workboat Policy**

2.6 CGG OFFSHORE HSE OBJECTIVES

In order to maintain and improve our HSE Management System for the benefit of the Health and Safety of our personnel and subcontractors, to reduce and control the impact of our activity on the Environment, and to bring risks inherent in marine seismic operations down to an acceptable level, yearly HSE objectives and targets are defined.

Both pro-active and reactive indicators are used to follow HSE results and objectives fulfilments. Objectives, targets and results are defined and analysed in bi-monthly HSE Management Reviews which decides of required corrective actions. The status of these objectives is recorded each month in a document covering the whole year.

 **Annex K: CGG Offshore HSE Objectives for current year**

3 ORGANISATION, RESOURCES AND DOCUMENTATION

The aims of definition and implementation of our HSE Management System are:

- allocation of sufficient resources, including personnel, financial, time and equipment,
- clear definition of HSE responsibilities covering preparation, execution and control of operations and structures for all levels of management,
- communication up and down through HSE meetings done on regular basis,
- training and competence standards for each position (including new employees),
- clear management of HSE standards,
- extensive documentation control (HSE plans, procedures...).

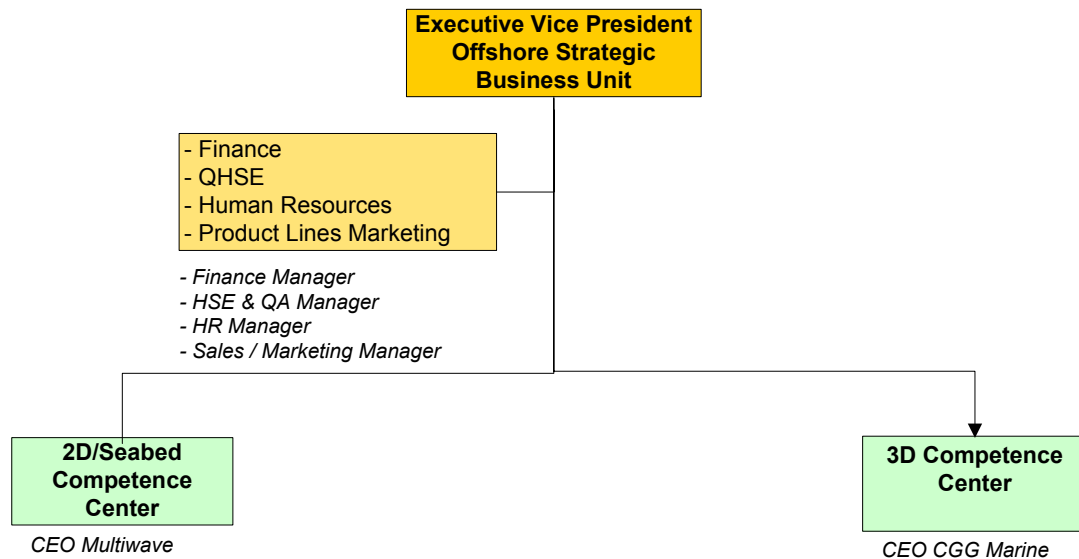
3.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES

The organisation charts that follow show the basic HSE organisation describing the reporting lines between CGG Offshore management, the vessel(s), client, and sub-contractor. CGG Offshore recognises the importance of defining a seamless structure, which provides unbroken lines of communication and responsibility between all employees and contractors.

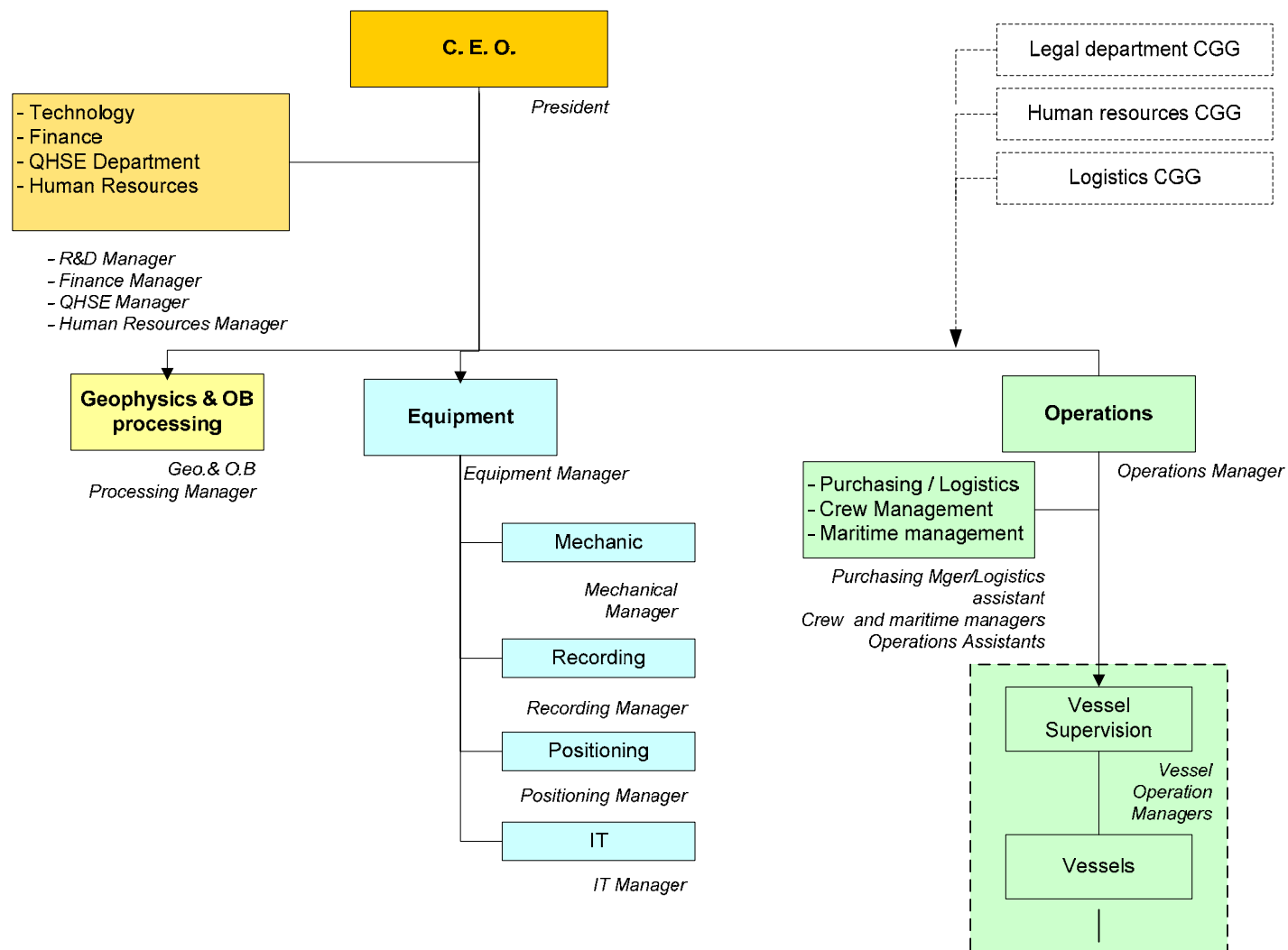
All personnel involved in CGG Offshore activities are responsible to some degree for HSE matters. Individual HSE Responsibilities are defined for key personnel in terms of:

- for whom they are responsible,
- for what they are responsible,
- to whom they are responsible.

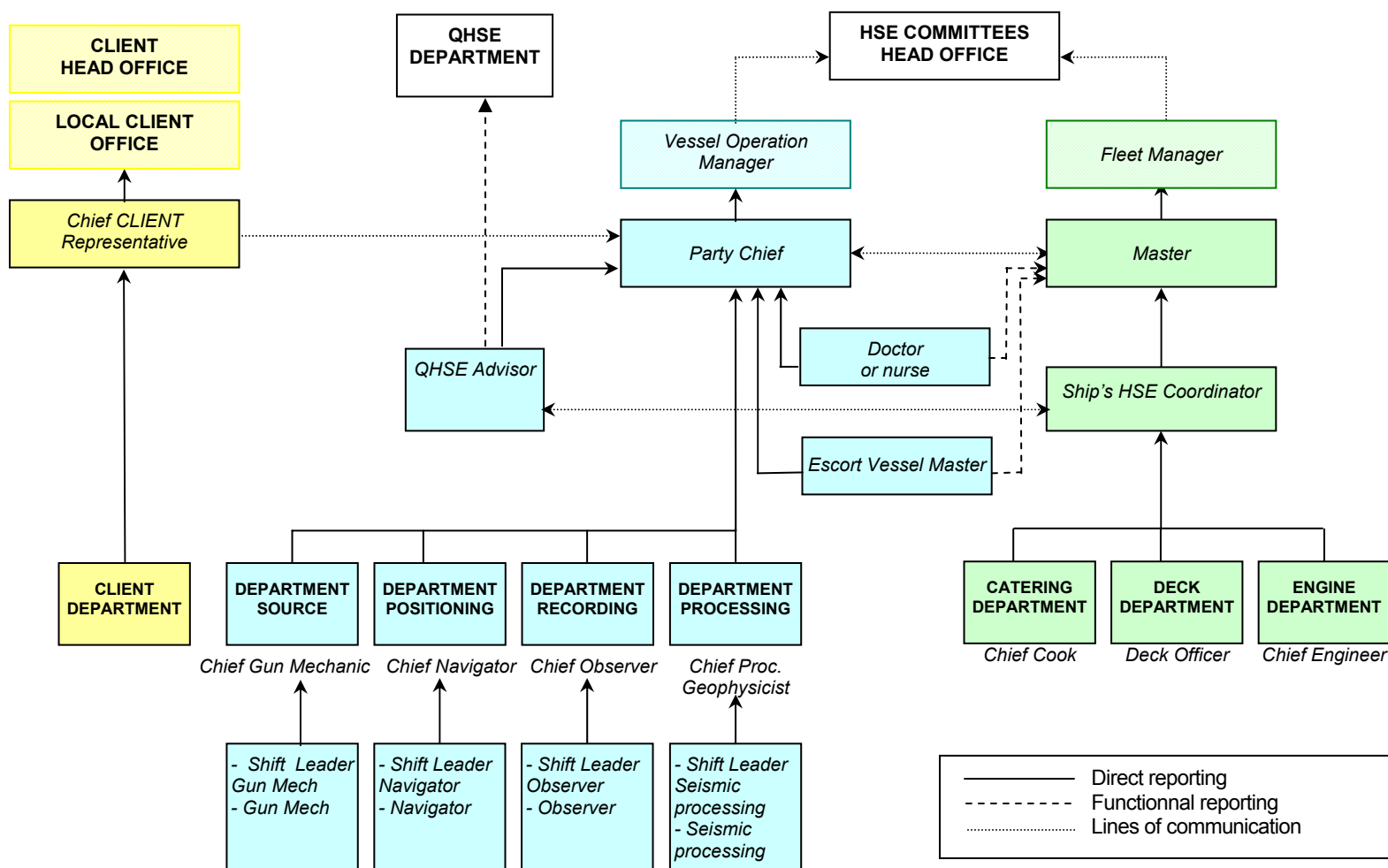
The tables overleaf show the general HSE Organisational Plan for CGG Offshore Operations.



3.1.1 General organisation in both Acquisition Units.



3.1.2 On board organisation



3.2 MANAGEMENT REPRESENTATIVES

CGG OFFSHORE appoints a Health, Safety and Environment Manager. Accountable to the President, he is responsible of setting up and permitting implementation of the HSE Management System. His responsibility in the animation of the HSE Management System, does not replace the responsibility of each personnel for himself, but also for the persons he is in charge of.

3.3 RESPONSIBILITIES

3.3.1 General

The final level of responsibility for Health, Safety and the Environment remains with every individual and in support of this principle all employees and contractors:

- make themselves familiar with and conform to the Health, Safety and Environment Policy at all times,
- observe all HSE rules and comply with safe working practices,
- are familiar with the Crew HSE Plan and comply with procedures and local & national legal regulations,
- ensure they are familiar with standard emergency instructions such as fire safety, 1st aid, boat drill, MOB drill and the emergency response plan,
- report all incidents and damage whether persons are injured or not to Department Head/vessel manager,
- make themselves familiar with and abide by the Drug and Alcohol Policy,
- not intentionally or recklessly interfere with or misuse any equipment, and particularly equipment designed to protect health, safety or the environment,
- develop personal awareness of HSE matters on the crew, report to immediate supervisors any shortfalls in, or non-compliance with, procedures, and participate actively to HSE meetings,
- wear the appropriate PPE and use appropriate safety devices at all times.

All employees have a duty to take responsible care for the Health and Safety of themselves and others who may be affected by their own acts or omissions. All employees have a duty to co-operate as far as necessary to enable that duty or requirement to be performed and complied with.

Employees are encouraged to improve standards of HSE and constructive suggestions will be welcomed. Such suggestions should be passed to the appropriate line manager.

3.3.2 Tasks and responsibilities

Apart from the above all employees and contractors may have specific responsibilities delegated to them. Personnel with a supervisory function have in addition direct line responsibility for the HSE of all personnel in their charge. This responsibility includes the HSE Management of personnel. Managers ensure that their personnel are adequately trained for both their job functions and the HSE matters connected with their job functions.

HSE responsibilities for key CGG Offshore employees can be found in a dedicated procedure *HSE Task & responsibilities*.

3.4 COMPETENCE

3.4.1 General

The competence of all employees and contractors is assessed according to their ability, skills, experience and knowledge. Annual assessments (or more frequently as circumstances dictate) will determine line-management positions and the competence of those performing HSE-critical tasks and activities. Competence assessments are based on:

Basic knowledge	
All personnel	<ul style="list-style-type: none"> - Work experience, and knowledge of HSE matters, - Willingness to participate in HSE initiatives, - Knowledge and development of safe working procedures and reviews, - Identification of health, safety and environmental hazards, - Reporting and communication skills, - Attendance at HSE meetings and input to it, - Levels of training attained for work related skills and HSE, - CGG Offshore "Curriculum"
In addition	
All vessel and shore personnel	<ul style="list-style-type: none"> - are conversant with work instructions and for their place of work for living/rest areas, - recognise health, safety and environmental hazards and ability to eliminate or control hazards, - use the reporting system, - have good knowledge of emergency plans, alarms and actions required in the event of an emergency.
Department Heads / Ships Officers / Shore Managers (as above plus):	<ul style="list-style-type: none"> - assess hazards using the risk matrix, - design safe working instructions using job safety analysis (JSA) techniques, - train others in safe working and emergency procedures, hazard recognition and the reporting system, - audit places of work at department level and provide report, - organise HSE meetings at department level, - understand the Remedial Action Plan System, - are conversant with the Crew HSE Plan and Project HSE Plan when they apply to their section, - supervise safe work and small teams in crisis situations.
Party chiefs / Masters (as above plus):	<ul style="list-style-type: none"> - inspection at crew / project management level, - organise HSE meetings at project level, - are fully conversant with the Project HSE Plan, its implementation and monitoring throughout the project, - are familiar with the HSEMS and Crew HSE Plan - manage crisis situation at project level.
Vessel Operation Managers	<ul style="list-style-type: none"> - are fully conversant with the Corporate HSEMS and Manager Safety Visits (MSV) and their implementation in all company activities, - are up to date with laws and regulations effecting their operations world-wide, - audit at management level, - identify areas of weakness and set realistic objectives and targets.
Department Managers (Operations, HSE, Equipment, Technology, Sales)	<ul style="list-style-type: none"> - are familiar with the SBU HSEMS and its implementation in their sphere of influence, - are up to date with laws and regulations effecting the operations they control, - audit at project level.
President	<ul style="list-style-type: none"> - is familiar with the corporate HSEMS, - is up to date with laws and regulations affecting corporate activities.

3.4.2 Training

CGG OFFSHORE recognises HSE training as a crucial element of the HSE Management. CGG Management reviews at least annually the HSE training plan and its compliance with industry guidelines and international regulations. CGG Management allocates the necessary financial resources to achieve the HSE Training Plan.

All new employees are given the necessary basic Industry HSE and job related training prior to the start of work. New recruits are integrated within the HSE Coaching program consisting in :

- HSE induction module in office and onboard upon arrival.
- Attribution of an HSE Coach who supervises the tasks and training of the new employee. He will generally be a Department Head (Chief Observer, Chief Navigator, Chief Gun Mechanic, Senior QC or Processing Geophysicist) or Senior Shift Leader. Regular assessments are made of the new employee's progress.
- Mandatory HSE tasks and training modules to be performed within first 2 periods onboard.
- Permanent identification on deck with dedicated helmet.

All offshore personnel attend a combined Offshore Fire-Fighting, Survival at Sea and HUET (Helicopter Underwater Escape Training) training. Refresher courses are attended as necessary.

All Managers attend 5 days HSEMS course compliant with OGP Guidelines (Management Modules).

Field Managers and Personnel attend internal and external courses compliant with OGP Guidelines (Field Management Modules and Operator Skill Modules).

All offshore personnel are required to carry an industry recognised Safety Training Passport (IAGC). Training records are kept within a centralized database.

3.4.3 Medical Fitness

All crewmembers undergo regular medical checks to obtain a "*Health Certificate for employees onboard ships*" as outlined by the authorities. All employees are responsible for keeping their own health certificate up to date even if the coordinator organises the medical check-up.

The HR co-ordinator in head office, and the Master and Party Chief on board keep a record of individual health certificates for the crew (respectively original and copies).

3.4.4 Drug and Alcohol Programme

The CGG OFFSHORE D&A program is fully compliant with the applicable industry standard "*Substance Abuse Guidelines for Management – OGP – Report n° 6.87/306 June 2000*".

3.5 CONTRACTORS

3.5.1 Contractor management

A contractor is defined as any company providing capital equipment, goods, services or personnel that will be operated or administrated by that company in the field as part of a CGG Offshore operation.

CGG Offshore will require the contractor to demonstrate willingness to comply with the CGG Offshore HSEMS.

CGG Offshore will assist as necessary as it recognises that some contractors may not have complete HSEMS in place. If systems are not in place at the time of the contractor tendering his services, then his bid must reflect those omissions for inclusion by or prior to mobilisation of the goods, services or personnel being provided.

3.5.2 Supplier management

A supplier is defined as any company providing capital equipment, goods, services or personnel which will not be operated or administrated by that company in the field but will be controlled directly by CGG Offshore.

Goods, services or personnel offered by suppliers will be checked by technical or other audit on delivery to ensure compliance with specifications defined in tender or purchase documents.

3.5.3 Subcontractor HSE management

- All subcontractors shall have a HSE Management System compatible with the CGG Offshore standards;
- All subcontractors shall comply with all safety regulations onboard;
- All subcontracted personnel report directly to the Party Chief;
- CGG Offshore reserves the right to perform Audits on all subcontractors.

Local regulations and contractual requirements will be considered and will take precedence over other policies/procedures where appropriate.

A qualified external company audits CGG Offshore's operations once a year. The subcontractor performance is included in the audit scope.

3.6 COMMUNICATION

3.6.1 Safety briefings and induction tour

Safety briefings: All employees and visitors receive a safety briefing at their first point of contact with any of the company activities or facilities. The briefing is conducted by the person in charge at the point of contact or her nominated representative, and is designed to provide essential information for emergency situations only.

Safety orientation / Induction tour: All new personnel on a vessel, or personnel who have not been onboard the vessel for a year, or visitors spending more than twelve hours or overnight on any CGG Offshore vessel receive a full HSE Orientation tour. The briefing and tour of the vessel/installation is conducted by the Marine and/or an HSE representative, within 24 hours of arriving at the vessel/installation or prior to departure, whichever comes first. The safety orientation will be specific to the operation.

Records: A permanent record of the HSE orientation is maintained at the company facility, and recipients are required to complete a checklist and to sign-off that they have received and understood the information.

3.6.2 HSE Meetings

HSE meetings are a key element in the HSEMS. All personnel on an operation must be included in HSE meetings at some level.

The purpose of meetings is to review the company, crew or department safety situation, reinforce control of on-going risks, investigate incidents and communicate up and down the line management structure.

CGG Offshore requires that safety meetings take place. Extraordinary meetings may be held at any time to address particular problems as they arise. Contractors who meet more often than the frequencies shown below should describe their system in their safety documentation.

Pre-survey meetings: These meetings are held during the preparation of the survey to access the HSE requirements and finalize the Project HSE Plan.

On board Kick-Off Meeting: meeting held at the beginning of the survey to assess contractual and HSE specifications, policies, reporting hazard notification, Scope of Work.

Routine HSE meetings: the following meetings have been established for the operations:

- **Tool Box Meeting (TBM):** Briefing/review on procedures for specific operations, introduction for new personnel, discussion of near miss incidents, hazard register (Hand Over TBM and Intervention TBM)
- **On Board Departmental Meeting (DM):** Analysis of HSE aspects department by department – preparation of M/V SCM.
- **On Board Safety Committee Meeting (M/V SCM):** General review of all HSE issues (outstanding TBM and DM), including Action Points still pending.

3.7 DOCUMENTATION CONTROL

3.7.1 HSE Documentation structure

The documentation is divided according to a classic document pyramid.

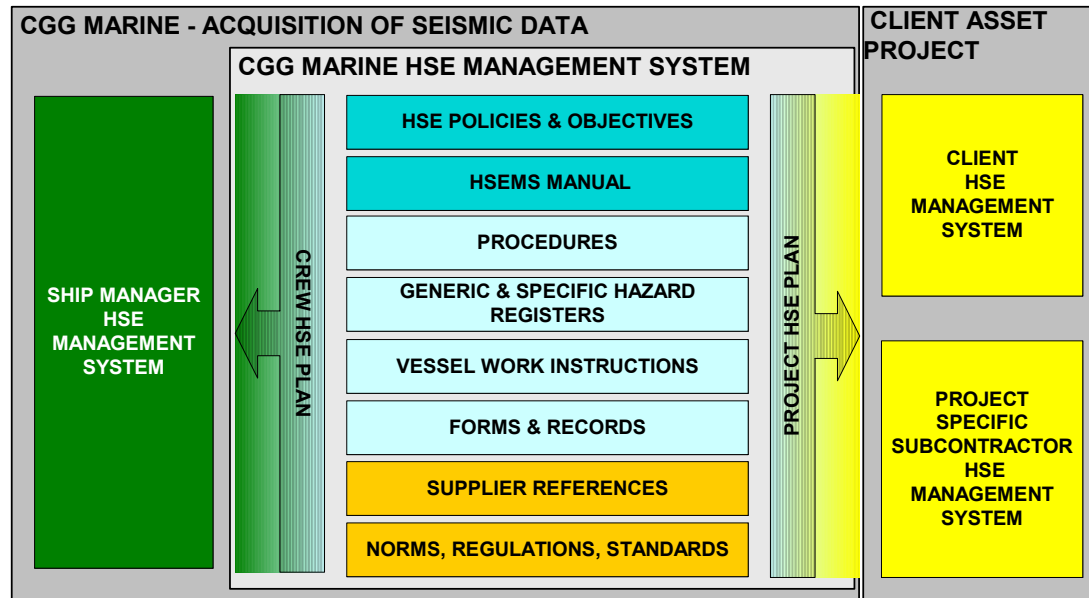


Figure 2 : HSE Documentation structure

HSE Policies and Objectives: Established in line with the CGG Corporate policy and yearly objectives. HSE objectives are revised every year during Management Review.

HSEMS Manual: The HSEMS Manual sets out organization commitment on HSE and its organization.

Crew HSE Plan: Each vessel has its own Crew HSE Plan which describes how the CGG Offshore HSE Management System is applied onboard the vessel. Generic hazards have been cascaded in specific hazards. Specific vessel work instructions, records and training modules are defined to control and reduce the risk linked to the operation onboard this vessel.

The Crew HSE plan is used as a bridging documents between CGG Offshore Seismic Operation and the ship manager Vessel Operations.

Generic & Specific hazard registers: CGG Offshore has established a generic hazard register relative to its operation. More than 170 hazards have been registered, and elements to reduce and control them identified. Control of generic hazard might be identical for all fleet or vessel dependent. This will be addressed in the Vessel Specific Hazard Register that constitutes the section IV of the Crew HSE Plan.

Project HSE Plan: Prior to the operation, a Project HSE plan is established. It is used as a bridging document between Client HSE Requirements not covered by our HSEMS. In the same manner, controls and requirements to our sub-contractors used for the project are recorded in this document.

Procedures: HSE procedures are written by experts on the subject.

- General Procedures: General Procedures are level-one procedures setting out the general organization of the process. A General Procedure is necessarily attached to one process and only one.
- Specific Procedures: Specific procedures are procedures specifying **the way to carry out an activity**. A Specific Procedure is attached to one process and describe how are managed the different tasks which contribute to ensure the quality of an activity.

Vessel Work Instructions (WI) are created onboard the vessels. WI have two main uses: one is to detail a general or specific procedure to a more precise instruction applicable onboard a vessel, the other is to establish an internal referential used onboard the vessel.

Records are documents stating results achieved or providing evidence of activities performed, where documents correspond to information and its support medium (e.g.: reports, filled forms...).

Forms are standard blank documents to be used, to record result or activities performance, usually within the context of the application of a Specific Procedure. Filled document becomes a record.

Norms and Standards : All internal and external reference documents, norms and standards needed to our operation are usually managed via our HSE Intranet.

3.7.2 HSE Document diffusion

The HSEMS documentation is firstly available on a dedicated web site. In addition, copies of Crew HSE Plan, Project HSE Plan and HSE Procedures, Manuals are held under the jurisdiction of the Master and Party Chief on board. The Ship Management company and CGG Offshore retain onboard copies of their relevant manuals.

Copies of the Crew HSE Plan are provided to each section of the crew. Each section reviews hazards and procedures relevant to them and makes suggestions for improvements.

HSE information is publicised onboard via web and on HSE notice board and/or posters on crews and shore facilities. It may also be subject of presentation / analysis in HSE meetings. The list of procedures and manuals is kept updated and available on the dedicated web site.

 **Annexe H: CGG Offshore Intranet Portal**

3.7.3 Control of documents


All Documents required by the HSE management system shall be controlled. The *Control of document* procedure defines the controls needed:

- To approve documents for adequacy prior to issue,
- To review and update as necessary and re-approve documents,
- To ensure that changes and the current revision status of documents are identified,
- To ensure that relevant versions of applicable documents are available at points of use,
- To ensure that documents remain legible and readily identifiable,
- To ensure that documents of external origin are identified and their distribution controlled, and to prevent the unintended use of obsolete documents, and to apply suitable identification to them if they are retained for any purpose.

3.7.4 HSE Standards

All activities are carried out in accordance with pre-defined standards and procedures. The hierarchy for their use in survey operations is:

- **International and National legal standards**, at least, are adhered to:
 - CGG OFFSHORE complies with all applicable health, safety and environmental International laws and French National Laws and Regulations or local ones if more stringent.
 - Norms, guidelines and industry standards : European legislation, OGP, IAGC, UKOOA, IMO ...
- **Client standards:**
 - CGG warrants that it is familiar with the contents and implications of the Client HSE policies, regulations and safe operating standards and complies with.
- **CGG OFFSHORE and CGG Group standards** are derived from **Industry standards**:
 - CGG takes all necessary precautions related to or arising out of the performance of the contract in order to protect the work, the personnel and property of the Client, CGG OFFSHORE and all third parties. Standards are verified against hazards and effect analysis. If such an analysis indicates a deficiency in legal standards, the most stringent hazard control measure shall apply.

 **Appendix 2: List of Standards**

4 EVALUATION AND RISK MANAGEMENT

Effective risk management is the cornerstone of the CGG Offshore HSEMS. The company Risk Management System is based on:

- *Systematic hazard identification*
- *Analysis of risks*
- *Control of hazards*
- *Recovery in the event of system failure*
- *Remedial action point system*

A Hazard is the potential of a situation or physical item to cause harm, including illness or injury, damage to property, plant, products or the environment, production losses or increased liabilities.

A Risk is the product of the chance that a specified undesired event will occur (**probability**) and the severity of the outcome of the event (**consequences**).

4.1 IDENTIFICATION OF HAZARDS AND EFFECTS

The hazard identification is based upon a corporate Hazard Register, containing nearly 170 references, articulated on three levels:

- **Category 1:** Hazard main category (Environment, Equipment, Product, Method, Personnel, Management)
- **Category 2:** Family of hazard, like Geological Factors for instance.
- **Category 3:** The hazard itself, coded on three digits.

4.2 EVALUATION

Hazard related to seismic operations onboard the vessel: The hazard assessment is conducted individually for each of the generic hazards and recorded into the *Vessel Specific Hazard Register*. This assessment, typically an accident scenario, is supported by the broad CGG seismic experience along with the industry knowledge. It is periodically reviewed by CGG HSE specialists and crews' feed back.

Hazards related to the project: As of tender stage, the Vessel Operation Manager conducts a yes / no assessment, re-evaluated on contract review and reviewed with the Client during the pre-survey meeting. The hazards pertaining to the project are included in the *Project HSE Plan* and discussed with the crew prior to job start. If adjustment is needed for more precise identification, the system allows creation of sub-hazards, with their own assessment, controls and recoveries, fully managed by the crew.

Escalating factors: All escalating factors are detailed to ensure proper recognition of the hazard and proper suitability of the existing procedures during hazard reviews.

Evaluation before mitigation: A first risk evaluation of the hazard is conducted by using the Risk Matrix. It gives a first appreciation of the risk level without control. Implementing the controls will reduce the risk to a level deemed 'as low as reasonably practicable'.


Risk Matrix: Risk assessment take into account both the potential consequence of the release of a hazard and the probability of such consequence materialising. CGG Offshore has developed and implemented its own HSE risk matrix, who differs slightly from the one describe in the OGP “HSE aspects in a contracting environment for geophysical operations”.

 **Appendix 4: CGG Offshore risk matrix**

4.3 RECORDING OF HAZARDS AND EFFECTS

The Hazard Sheets are managed at three level:

1. Generic Hazard Register: periodic review at corporate level, hazard data sheets are modified according to recent history.
2. Crew HSE Plan - Specific Hazard Register: hazard data sheets are cascaded in sub hazards linked to the installation.
3. Project HSE Plan - Specific Hazard Register: hazard data sheets are cascaded in sub hazards linked to the project or the area.

 **Appendix 3: Hazard Data Sheet**

4.4 RISK REDUCTION MEASURES

Risk reduction measures include both those **to prevent** incidents (reducing the probability of occurrence) and to **mitigate** chronic and acute effects (reducing the consequences or the gravity). Recovery plans allow proper responses when barriers fail.

4.4.1 Prevention, Mitigation

Prevention is done by hazard control. Hazard control includes the appropriate measures undertaken to reduce the likelihood of the incident/accident occurring. Such measures include: elimination, substitution, reduction, isolation, control and protection.

- Procedures that apply
- Check Lists in use
- Training to improve competency and knowledge
- Contingency plans well known
- Drills
- Safety rules forbidding certain activities under abnormal hazardous conditions.
- Warning system procedure documented and known to staff. Warning signs and posters displayed at hazardous work areas.
- Permit To Work system (PTW), Lock-out / Tag-out clearly known to staff and strictly followed.
- MOPO (Manual Of Permitted Operations) in place.
- Forecast alert bulletins, weather monitoring.
- Application of preventive measures
- Use of PPE
- Design of equipment

Each hazard sheet presents the list of procedures to be applied to get proper controls. The procedures are automatically cross linked to the hazards they control when they are edited. In addition, the link with who is supervising and who is executing procedures allows precise definition of all responsibilities. The crew will precisely details its controls in crew specific Work Instructions.

4.4.2 Recovery

Measures taken to re-establish control over the hazard once it has been exposed through undertaking actions to regain control. When an incident does occur, response must be timely and effective through different measures like:

- Contingency plans: fire fighting, spillage control, search and rescue, security,
- Medical facilities: first aid unit, referral hospitals,
- Medevac plan
- Abandonment
- Rescue plan: general evacuation, life saving,
- Notification, Investigation, Reporting

These recoveries are referenced in the vessel Crew HSE Plan and the Project HSE Plan, some are fully controlled by Ship Managers.

4.4.3 Health Risk Assessment (HRA)

CGG Offshore developed a tool to assess health hazards on the worksite. Allowing a review task by task, the HRA conducts an exhaustive review of all following agents:

- Chemicals,
- Physicals,
- Ergonomic, psychosocial and organizational.

Harmful effects and precautions to be taken are detailed.

 **Appendix 5: Health Risk Assessment**

4.4.4 Environmental Risk Assessment (ERA)

CGG Offshore, inline with the Group Environmental Policy, has implemented a specific tool to assess risk, mitigate or eliminate damage to the environment and deliver environmental performance. The aim of this tool is to:

- Insure compliance with legal requirements (local laws and regulations), client requirements (contractual), ISO 14001 standards and Internal standards.
- Integrate EIA recommendations when document is available
- Assess any significant changes to the environment resulting from our activities
- Manage risk by implementing measures and actions to eliminate or reduce identified potential significant impacts
- Monitor and evaluate performance
- Communicate with interested parties

 **Appendix 7 : Environmental Risk Assessment**

5 PLANNING

5.1 GENERAL AND STANDARDS

CGG Offshore conducts its operations in line with international regulations and industry guidelines as laid out the list of Standards Appendix 2.

CGG OFFSHORE maintains, within its overall work programme, plans for achieving its HSE strategic objectives and performance criteria. These include planning for existing operations, managing changes and protecting asset integrity. To protecting asset integrity CGG Offshore pays particular attention to the design, manufacture, installation, maintenance, testing and inspection of key equipment. Key equipment being that identified in the evaluation process as being critical to the continued effectiveness of HSE controls.

There are three levels of planning:

- **Head Office** level consists of developing HSE policies, strategic objectives and the HSE Management System, yearly plan,
- **Project** level consists of developing the HSE Plan, that includes organisation, responsibilities, resources, communication, training and documents,
- **Crew** level consists of:
 - management of the HSEMS on board the vessel,
 - management, supervision and application of Work Instructions,
 - determining adequate human resources, equipment, tools and services to do the work, a safe workplace, a safe method of working and safe equipment through maintenance routines,
 - anticipation of future operational changes, medium term planning, prepared by the Party Chief.

The documentation associated with the HSEMS is designed to provide a description of the system and to serve as a permanent record of the implementation and maintenance of that system. The documentation enhances the system by:

- demonstrating the existence of system and practices;
- avoiding information-dependency being invested solely in individuals;
- channelling information efficiently to where it is needed;
- aiding awareness of responsibilities and correct tasks performance;
- reducing learning time on new tasks and preventing repetition of errors;
- providing for verification of systems and performance by audit.

5.2 ASSET INTEGRITY

A proper design stage, integrating all HSE requirements, and a controlled maintenance process should ensure our asset integrity, this is why CGG Offshore maintains a certified Quality system in line with ISO 9000 standards. Nevertheless CGG Offshore recognises the exposure to third party and natural events that may jeopardize its assets: therefore, sound risk assessments at planning stage are key issues.

5.3 PROCEDURES AND WORK INSTRUCTIONS

Documented procedures are prepared for any activities where the absence of such procedures could result in infringement of HSE policy, legal requirements or other performance criteria.

Safe working procedures are designed to address the following aspects of job safety prevention:

- **Safe Place:** the work site is designed and controls put in place to ensure that the working environment provides no significant risk to personnel, property or the environment;
- **Safe Equipment:** all equipment for any job, including tools, machinery and protective equipment are specified or designed to ensure that it poses no significant risk to personnel, property or the environment. All equipment will comply with legal standards of conformity and test.
- **Safe Procedure:** a procedure is designed for any job to facilitate safe use of the equipment at the workplace to complete tasks with no significant risk to personnel, property or the environment. Design of a procedure is based on step by step analysis of the tasks involved (ex.: Job Safety Analysis), identification of associated hazards and elimination or control of those hazards.
- **Trained Personnel:** suitable job-specific, safety skills and supervision training are provided to personnel involved in the activity so they are able to use the procedures and equipment at the workplace with no significant risk to personnel, property and the environment.
- Where necessary Work Instructions are implemented in addition with the Permit To Work System, toolbox meetings and the use of extensive checklists.

CGG Offshore procedures (General or Specific) are documented by the Head Office (managed by HSE/QA Manager) whereas Work Instructions are in the Crew HSE Plan for onboard managed documentation.

5.4 MANAGEMENT OF CHANGE

A management of change procedure has been developed to make sure that significant change in the working environment is evaluated, risks assessed and any change in process or procedure is authorised.

Three levels of change are identified within CGG OFFSHORE working environment.

- **Level 1 changes:** changes in the general system which will affect policies, objectives and could create an extension of the system
- **Level 2 changes:** changes that will affect, improve or modify an existing procedure or control, or will imply the need for new procedures or modifying the yearly training plan.
- **Level 3 changes:** changes that will lead to modify the existing HSE practices at the scale of a project (working instructions, emergency response at project level, resources...).

Anybody within the organisation has the right to initiate a request for change.

5.5 Project HSE Plan

This document provides the information required for the implementation of the HSE Management System at project specific level.

In addition it contains particular Client requirements, procedures to comply with local and national regulations, environmental considerations, site specific hazards and control measures not covered in the Crew HSE Plan, local activities etc.

It also serves as interface documents with the Client's HSEMS. Included in the Plan are lines of communication and emergency response plans.

Within CGG Offshore the basic structure and template of the Project HSE Plan is drafted and verified by the HSE Manager. This document is then passed on to the Vessel Operation Manager who, as custodian, is responsible for its update, maintenance and dissemination for his survey on progress. Prior to dissemination the VOM signs it. The Plan is then made available to the appropriate users on board through various means, either in hard copy, disc or web.

During the survey should any modifications be required the Project HSE Plan is updated accordingly and a new version number is issued.

5.6 Crew HSE Plan

The HSE - MS is put into effect in field operations through the Crew HSE Plan.

The purpose of the Crew HSE Plan provides assurance of the effective working of the HSE Management System at a site-specific level. It also provides a simple, methodical and auditable reference document containing all information relevant to the protection of people, the environment and assets on board.

It serves as a vehicle for the assessment of risk to the operation. It also serves as a bridging document between CGG Offshore and the Ship Manager at site level. As such, it describes the interfaced organisation and applicable standards.

Its purpose is to provide to every actor on board the vessel a clear view of our HSEMS and the inter-relations with the Ship Managers's one. It is therefore clearly an interface document, which:

- gives references of the documentation established at corporate levels (CGG Offshore and Ship Manager) (i.e.: not the full document itself, to avoid redundancy)
- gives references and actual documents for all shore-based managed instructions.

5.7 CONTINGENCY AND EMERGENCY PLANNING

Whilst CGG OFFSHORE provides fully-trained and competent personnel, careful supervision and comprehensive planning for a survey, the company nevertheless accepts it is necessary to anticipate potential incidents and plan clear, appropriate and rapid responses to them.

An emergency response plan is therefore prepared in consultation with the Client and is issued during the mobilisation for the survey.

The risk management process is designed to identify situations that may be considered as having the potential to become emergencies, where life may be endangered or the whole crew or vessel is placed in danger.

Because of the nature of seismic acquisition operations, CGG Offshore requires that emergency plans are prepared for every installation and tuned according to the project specifications for the following scenarios:

- fire on any vessel, installation or work site,
- abandonment of any vessel, installation or work site,
- medical emergency response and evacuation (medevac),
- rescue of Man Overboard (MOB).

In addition Emergency Response Plans are developed for: adverse weather and natural hazards, fuel/chemical spill, aircraft incident, rescue or workboat recovery, interference from activist groups, civil disturbance, criminal and piracy activity.

Emergency plans are based on one or more of the following prioritised items:

- save human life,
- move to a place of safety,
- save assets (without endangering personnel),
- protect the environment (without endangering personnel).

Note that items 3 and 4 are of equal importance.

Environmental emergency response: The MARPOL 73/78 regulations are fully implemented on all CGG Offshore vessels. Every vessel has a Shipboard Oil Pollution Emergency Plan (SOPEP) as required by MARPOL 73/78, Annex I, Regulation 26.

6 IMPLEMENTATION AND MONITORING

6.1 ACTIVITIES & TASKS

The strategic objectives developed at the Corporate (Head Office) level are implemented on the crew with due regard to HSE policies and the HSEMS.

At the work-site level, specific tasks are achieved through work instructions and procedures and are included in job descriptions and HSE responsibilities for each operator.

Management is responsible for the conduct and verification of activities and tasks according to relevant procedures. This commitment to the implementation of policies and plans includes, amongst other duties, ensuring that HSE objectives are met and that performance criteria and control limits are fulfilled, establishing that an accurate inventory of equipment is recorded and ensuring preventative maintenance schedules are developed and implemented.

6.2 MONITORING

Performance monitoring

At the beginning of each month, upon reception of site monthly reports, performance indicators that show the progress towards the HSE objectives are provided by HSE department. The Head Office HSE Committee reviews these indicators every two months and a set of statistical charts for the fleet is developed. These charts are distributed to all departments and throughout the fleet.

HSE results monitoring

- **Daily operation report:** Sent by the Party Chief and includes the following HSE Matters for the period:
 - 24 hours reporting for high risk notification
 - Incidents/accidents
 - Medium or high risks identified
 - Drills conducted
 - HSE meetings
- **Monthly HSE report :** A monthly HSE Report is compiled by the Party Chief or the QHSE Advisor .

6.3 RECORDS

Procedures define appropriate records to be maintained in order to provide evidence of conformity to requirements and of the effective operation of the HSE management system. Records shall remain legible, readily identifiable and retrievable. The *Control of records* procedure defines the controls needed for the identification, storage, protection, retrieval, retention time and disposition of records.

6.4 NON-COMPLIANCE AND CORRECTIVE ACTIONS

6.4.1 Remedial action point system

Hazards and risks not immediately controlled are recorded in a crew Remedial Action Plan (RAP), which tracks hazards remaining in an uncontrolled condition as Action Points (AP). For each AP, the following are defined:

- description of the hazard;
- action plan to control the hazard;
- person/s responsible for executing the action plan;
- time limit on execution of the action plan;
- the status of the AP (open or closed),
- verification of closure of AP.

Monitoring of AP is under responsibility of the Vessel Operation Manager. The main sources of AP are:

- accident / incident investigation,
- inspections and audits,
- minutes of meetings,
- suggestions by the personnel.

6.4.2 UNSAFE ACT/CONDITIONS AUDITING, MSV

An Unsafe Act is defined as any act that deviates from a generally recognised safe way or specified method of doing a job and increases the potential for an accident.

The aim of the Unsafe Act auditing is to identify hazardous acts or situations and to correct them before an incident happens.

Managers visiting vessels conduct Manager Safety Visits (MSV), refer to § 7.1. It consists in an observation of a specific task by a Manager. A positive approach is preferred; it means that, during discussions, auditor highlights good practices.

Within the same approach, Crew Members regularly conduct Crew Safety Visits consisting in the observation of a specific task and discussion between employees to highlight good practices and review Hazards linked to the operation.

6.4.3 SAFE-T-CARDS

As an extension of the Unsafe Act audit, the aim of the Safe-T-Cards system is to identify hazardous situations and to correct them before an incident happens, from the seismic crew “point-of-view” (including subcontractors on board all vessels).

6.5 INCIDENT REPORTING

6.5.1 Definitions

<i>Fatality (FAA):</i>	Personal accident leading to the death of the victim.
<i>Lost Time Injury (LTI):</i>	Work-related personal accident which prevents the victim from doing any work the day after the accident (including fatalities).
<i>Restricted Work Case (RWC):</i>	Work-related personal accident which prevents the victim from doing her normal work after 24hr, but she is still able to perform other useful work or some of his normal work.
<i>Medical Treatment Case (MTC):</i>	Work-related personal accident which requires medical / paramedic treatment, but fit for work.
<i>First Aid Case (FAC):</i>	Work-related minor injury which is or could be treated by a first aid worker.
<i>Material Accident (MAA):</i>	Any equipment failure or damage which could have had real and direct consequences related to HSE.
<i>Environmental Disturbance (END):</i>	Any incident caused by our activity and that affects the environment (pollution, third parties: local activity disrupted or affected...).
<i>Near Miss (NEM):</i>	Incident with no immediate consequences (i.e. body injuries or damage) but under different circumstances may have caused injuries or damage. If a situation occurs where a material accident could have caused body injuries, it will be preferably reported as a Near Miss.
<i>Unsafe Act/ Unsafe Condition (UNA):</i>	Any act that deviates from a generally recognised safe way or specified method of doing a job and increases the potential for an accident.
<i>High Potential Incident (HPI) :</i>	Any accident with a potential Gravity of 4 or 5, including Near Misses (not Unsafe Acts).

6.5.2 Incident investigation

The prime reason for conducting an investigation is to prevent reoccurrence of the accident or incident concerned. The investigation also provides an accurate record for Company or insurance use, for compiling statistics and for regulatory compliance where applicable.

The investigation of incidents, the size and composition of the investigation team depends on the incident. CGG Offshore or contractor management or the Client may join the team according the situation. Internal investigations may be conducted in parallel with external investigations by government authorities. CGG Offshore provides full support of any such external investigations, and requires similar support from its contractors. The CGG Offshore report form is required for all reportable incidents.

The HSE department issues safety bulletins when necessary, which will include significant incidents and risks. Recommendations from incident investigations are processed via the Remedial Action Plan System.

6.5.3 Risk Evaluation

Accidents and Incidents, which occurred, are subject to risk evaluation. Risk Evaluation techniques are used in conjunction with the judgement of experienced personnel such as the Party Chief and the HSE Advisor and quantified using the HSEMS Risk Matrix. Evaluation takes into account:

- the probability of occurrence,
- the worst severity of the consequences that could have been resulting for
 - people
 - environment
 - assets
 - production

6.5.4 Incident Reporting System

CGG Offshore has developed a dedicated database as its main reporting tool for accidents/incidents. All accidents are reported using standardised forms.

The potentiality of the incident dictates the distribution list and investigation deepness; High Potential Incidents are sent to the CGG Group CEO within 24 hours.

6.6 INCIDENT FOLLOW-UP

Once imported in CGG Offshore Accident Database, all accidents are reviewed, analysed and actions recorded. Every installation (vessel, onshore station...) and the Head Office are managing action points with the Remedial Action Plan (RAP).

Various statistics are produced to allow proper follow up and objective reviews: mid term and long term plans should be implemented to react when recurrent types or causes of accidents are identified.

7 AUDITING

7.1 OBJECTIVES OF HSE AUDITS

The goals for implementing an audit system are:

- Verify the conformance and effectiveness of the established HSE system, guidelines and standards with the implementation at crew level. (Adequacy of the HSEMS)
- Evaluate HSE aspect of the activities, to identify shortcomings, to identify remedies and to update the hazard management strategies.
- Check the quality and regularity of the monitoring system on the crew: unsafe act audit, section inspection and crew management inspection.
- Assist field crew with the implementation of the remedial actions with the aim of enhancing crew HSE system.

Positive aspects should be highlighted during audit process and in the audit reports, the audit being before all an improvement tool.

CGG Offshore does not recognise any value in unannounced audits, and undertakes to inform its contractors well in advance of forthcoming audit activity. Any other audits occurring should receive the same courtesy.

7.2 DEFINITIONS

<i>Audit:</i>	Independent examination of the HSE system (in its whole or in part) to assess how it has been used over a period, and to make sure it has operated as intended. A formal Audit report is produced.
<i>Inspection:</i>	Examination of a precise part of the system through the completion of a Checklist.
<i>Unsafe act audit:</i>	Analysis conducted by managers visiting the vessel and on board managers, to review a process, a method, a situation... where the goal is to track any unsafe aspect which may lead to actual incident / accident
<i>SafeT-Cards</i>	System allows all employees on board to report unsafe acts and unsafe situations.
<i>Management Safety Visit (MSV)</i>	Field inspection lead by a manager, focusing on a precise aspect of operations, to immediately address concrete HSE issues.
<i>Crew Safety Visit (CSV)</i>	Observation of a specific task within the crew to review hazards linked to the operation and verify control measures.
<i>"Must Have" Inspection</i>	Examination of a specific process by a Manager through a Checklist. Statistics are made and underperforming issues are actioned.

7.3 AUDIT PLANNING

An audit plan is defined at the beginning of the year. It covers the entire scope of geophysical operation including those managed by subcontractors.

Audit team	Vessel	Escort vessel
External Auditor	HSE audit of the whole operations Each vessel audit: 1 / year	HSE audit of the whole operations Each vessel audit: 1 / year

Audit team	Vessel	Escort vessel
Internal Auditor	HSE audit of the whole operations Each vessel audit: 1 / year	HSE audit of the whole operations Each vessel audit: 1 / year
Department Managers (Ops, Equip., HSE)	HSE Inspection or Must Haves Inspection: Each time boarding a vessel, with a minimum of 4 different vessels per year	HSE Inspection Combined with the M/V inspection
Vessel Operation Manager	HSE Inspection or Must Haves Inspection: Minimum of 6 times per year	HSE inspection Start up of operation
Technical Managers	HSE inspection Each time boarding, with a minimum of 4 different vessels per year	
Party Chief, and/or on board HSE Advisor if any	HSE inspection of all the vessel 1 / month	
Head of departments	Cross HSE inspection of their work places 1 / month/dept	

7.4 AUDITS REPORT

Audits report are widely despatched to top management of CGG Offshore and CGG Corporate, including CEO. Where necessary some issues with possible application to the whole fleet are analysed in the HO SCM, in order to establish and implement actions at corporate level.

8 REVIEWING

Every two months, the Head Office HSE Committee review the HSEMS and its performance to ensure its continuing suitability and effectiveness. This review is done according to an established agenda including:

- Minutes of previous meeting
- Topical subjects
- Review of last incidents and accidents
- Performance & statistics
- Audits results and remedial actions
- Training
- OGP – IAGC – IMO
- Any other business

A formal report is written by the HSE Manager, sent to all the personnel and published on the HSE Intranet.

An annual review is prepared at the beginning of the year, presented to the “Comité d'Hygiène et Sécurité et Conditions de Travail” (CHSCT, French regulatory committee), with other CGG Group HSE results. The annual report is available on Intranet.

APPENDIX 1 : TRAINING MATRIX

OFFSHORE SBU TRAINING MATRIX GUIDELINE			Job description codes JD:																																	
Duration: C = Classwork P = Practical Symbols: T = Trainer ability E = External training center only S = Special instructions	Duration (min)	Job description codes JD:																																		
		Visitors	Office Personnel (1)	Office Personnel (2)	Department Manager	Vessel Operations Manager	Party Chief	HSE Advisor	Gun Chief	Chief Observer	Chief Navigator	Chief Seismic Processing	Shift Leader Gun Mechanic	Shift Leader Observer	Shift Leader Navigator	Shift Leader Seismic Processing	Gun Mechanic	Observer	Navigator	Seismic Processor	New employee	Shore Representative	Medical Doctor	Paramedic	Master	Chief Mate	Mate	Chief Engineer	Engineer	Electrician (if any)	Filter/Motorman	Boatman	Seaman	Chief Cook	Cook	
MM1A/B	HSE MS Executives Senior Managers, PC, PM	6 hours																																		
MM2	Operation Sites Management	6 hours																																		
MM3	Emergency Response Planning	3 hours																																		
MM4 B	Journey Management (Water)	3 hours																																		
MAM1	Serious Incident Investigation	6 hours																																		
MAM2	Auditing Techniques	6 hours																																		
MAM3	Unsafe Act Auditing	6 hours																																		
MAM4	Lockout/Tagout and Permit to Work systems	2 hours																																		
MAM5	Substance Abuse Monitoring & Testing	3 hours																																		
MAM6	Media Handling/Public relations	6 hours																																		
FMM1	Meetings and Committee Organisation	2 hours																																		
FMM2	Incident Reporting and Classification	2 hours																																		
FMM3	General Environmental Management	6 hours																																		
FMM4	Hazardous and other Waste Management	3 hours																																		
FMM5	Incident Investigation	6 hours																																		
FMM6	Job Hazard Analysis	3 hours																																		
FMM7	Fire Prevention and Control	6 hours																																		
FMM8	Personal Protective Equipment - Its proper use	3 hours																																		
FMM9	Lockout Tagout and Permit to Work	3 hours																																		
FMM10	Safety Harnesses (new)	2 hours																																		
FMM11	Workshop Practices	3 hours																																		
FMM15	Hazardous Materials Handling	6 hours																																		
FMM16	Pressure Systems in the Workplace	2 hours																																		
FMM17	Operating in and around Hazardous Facilities	2 hours																																		
FMM18	Spill Response	3 hours																																		
FMM19	Ergonomics	3 hours																																		
FMM20	Managing Contractor Interfaces	6 hours																																		
FMM21	Electrical Safety	6 hours																																		
W FMM1	Lifting and Towing	2 hours																																		
W FMM2	Safe Navigation Practices	3 hours																																		
W FMM3	PPE Protection of the hand	2 hours																																		
W FMM4	Manager Safety Visit	2 hours																																		
OSM6	Small Boats Marine Operations MOB/FRC)	3C + 3P																																		
OSM10	Helicopter Landing Officer (HLO)	6 hours																																		
OSM11	Helicopter Loadmaster	3C+3P																																		
OSM12	Helicopter Underwater Escape - HUE1	2C + 1P	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	
OSM13	Permit to Work/Lockout/Tagout	3 hours																																		
OSM14	Machinery	1 hour																																		
OSM15	Abrasive Wheels	1 hour																																		
OSM16	Cutting & Welding Gas & Electric	2C + 4P																																		
OSM17	High Pressure	6 hours																																		
OSM18A	Mechanical Handling (Cranes)	1C + 2P																																		
OSM18B	Wire/Synthetic Rope Utilisation	3 hours																																		
OSM22	Safety Harnesses	1 hour																																		
OSM24	First Aider - Module 2 - 4 minutes (ERP)	18h C+P																																		
OSM25	First Aider - Module 3 - 20 minutes (ERP)	30h C+P																																		
OSM27	Fire Warden	1 hour																																		
OSM28	Advanced Fire Fighting - Marine Operations	8C + 8P																																		
OSM29	Breathing Apparatus General Use	2C + 2P	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	
OSM30	Manual Handling and Lifting	2C + 2P																																		
OSM31	Confined Space Operations	2C + 2P																																		
OSM32	Working at Heights	3 hours																																		
OSM33	On Site Food Handling and Hygiene	6 hours																																		
OSM23	First Aider - Module 1 - Basic	3 hours	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	
OSM26	Basic Fire Fighting Techniques	3C + 3P	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E
OSM29	Breathing Apparatus General Use	2C + 2P	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E
OSM35A	Survival Techniques (Sea)	6 hours	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E	4E
WOSM1	Pallet trolley driver	1 hour																																		
WOSM2	Cetaceans Watching	8 hours																																		
WOSM3	Lif jackets verification training (Remploy)	4 hours																																		
WOSM4	Crew Safety Visits	1 hour																																		
W OSM5	Workboat coxswain (if required)																																			

Note:

MM = Management Planning Modules

MAM = Management Activity Modules

FMM = Field Management Modules

APPENDIX 2 : BASIC INDUSTRY STANDARDS

	Reference	Title
OGP	Report N° 6.92/317, May 2001	HSE Aspects in a Contracting Environment for Geophysical Operations - Schedules and Plans
OGP	Report N° 6.36/210, Jul. 1994	Guidelines for the development and application of Health, Safety and Environmental Management Systems
OGP	Report N° 6.64/291, Sep. 1999	Guidelines for working together in a contractual environment
OGP	Report N° 6.78/292, June 1999	HSE Competence Assessment and Training Guidelines for the Geophysical Industry
OGP	Report N° 6.53/245, Sep. 1996	Guidelines for HSE auditing in the geophysical industry
OGP	Report N° 6.40/217, Dec. 1994	Generic Hazards Register for Geophysical Operations
OGP	Report N° 6.52/244, Sep. 1999	Glossary of HSE terms
OGP	Report N° 6.5/325, jan. 2002	Safety incident reporting system users' guide
OGP	Report N° 6.54/246, Oct. 1996	Loss costing guidelines
OGP	Report N° 6.15/160, Feb. 1990	Checklist for an audit of safety management
OGP	Report N° 343 - May 2003	Managing health for field operations in oil & gas activities
OGP	Report N° 6.55/321, 2001	Guidelines for the control of HIV - Hepatitis B and C in the workplace
OGP	Report N° 6.88/307, Jun. 2000	Strategic Health Management - Principles and guidelines for the oil & gas industry
OGP	Report N° 6.87/306, June 2000	Substance Abuse - Guidelines for Management
OGP	Report N° 6.46/228, 1995	Health Assessment of Fitness to work in the E&P Industry
OGP	Report N° 6.65/270, Jan. 1998	Health Aspects of Work in Extreme Climates within the E&P Industry - The Cold
OGP	Report N° 6.70/279, Sep. 1998	Health Aspects of Work in Extreme Climates within the E&P Industry - The Heat
OGP	Report N° 6.78/290, Jun. 1999	Health performance indicators
OGP	Report N° 6.44/222, May 1995	Standards for Local Medical Support
OGP	Report N° 6.57/323, 2001	Fuel system review checklist
OGP	Report N° 6.56/322, 2001	Offshore helideck review checklist
OGP	Report N° 6.94/320, 2001	Firearms and the use of force
OGP	Report N° 6.85/304, 2000	Fire system integrity assurance
OGP	Report N° 6.51/239, 1998	Aircraft management Guide
OGP	Report N° 6.42/220, 1995	Guidelines on the use of small Boats in Marine Geophysical Operations
OGP	Report N° 6.50/238, 1996	Land transport Safety Guidelines
OGP	Report N° 6.29/189, 1993	Guidelines on Permit to Work (PTW) Systems
OGP	Report N° 2.72/254, 1997	Environmental Management in Oil and Gas Exploration and Production
OGP	Report N° 2.58/196, Sep. 1993	Exploration and Production Waste management guidelines
JNCC		Guidelines for minimizing acoustic disturbance to marine mammals from seismic surveys
JNCC		Guide line to using mammal recording form
JNCC		Marine mammal recording forms

	Reference	Title
JNCC		Location and effort data Location and effort data
JNCC		Record of operations
JNCC		Record of sighting
IMO	Convention MARPOL	Regulations for the prevention of pollution and sea
IMO	Convention SOLAS	International Convention for Safety Of Life At Sea
IAGC	IAGC - 1997	Marine geophysical operations safety manual
IAGC	IAGC - 2001	Environmental Manual for World-wide Geophysical Operations
		Code du Travail Maritime (French Merchant Navy Working Code)
		Code du Travail (French Working Code, all industries)

APPENDIX 3 : HAZARD DATA SHEET

HAZARD DESCRIPTION:	Description of Hazard as listed in the CGG Offshore Hazard Register (i.e.. water, fire,...etc.)
CGG Offshore reference:	Hazard number as listed in the CGG Offshore Register
Client ref n°:	Hazard number as listed in the Client hazard register
Activity:	Activity involving hazard
Risk assessment:	Brief description of hazard in relation to activity (event possibly leading to accident, possible consequences,...etc.)
Escalation factor (the):	Element which may increase the overall probability or severity of accident
Exposure:	Indicate exposure from Very Low (E) to Very High (A)
Potential:	Indicate potential from Light Accident (5) to multiple catastrophe (1)
Control measures:	Cross references to procedures, training and inspections processes
Recovery Measures:	Reference to a generic emergency response plan or notification
Safety critical task:	Describe Task to be completed in order to have adequate control or recovery
By:	Position of person in charge of implementing task
Reference:	Reference to documentation, procedure,...etc.
Applicable procedure:	Reference to procedure numbers
Job description applicable:	Reference to job descriptions numbers
Prepared by:	Author of Hazard data sheet
Approved by:	Name of person in charge
Revised:	Latest revision date.

FileMaker Pro - [WZ HR Generic.FP5]

Fichier Edition Affichage Insertion Format Fiches Scripts Fenêtre Aide

CGG OFFSHORE HAZARD REGISTER - GENERIC HAZARD SHEET Version 3.1 July 2003

Category 1 Hazard	Category 2 Hazard	Category 3 Hazard	Hazard Code	Hazard Comments
EQUIPMENT	High pressure systems	High pressure hydraulic system	214	Hydraulics circuitry and distributors

Hazard Assessment Hydraulic systems can be found on winches, cranes, gun boat. The rupture at any point of the pressurized hydraulic circuit may cause serious damage with potential severe injury to personnel. Hydraulic spill impact. Whipping hoses (less than with air pressured hose).

Check spelling

Escalating factors Poor inspection / maintenance programs. Poorly qualified personnel. Insufficient machinery guards or protection. Lack of emergency cut off switch. Lack of appropriate PPEs. No spillage plan / cleaning agent / means of containment. Unwanted personnel / third party in the vicinity of pressurized system

Recovery ☒ Medevac ☐ Fire fighting ☒ Spillage Plan ☐ Notification Investigation Reporting
☒ First Aid ☐ Abandonment ☐ Search & Rescue ☐ Security Plan

Risk Assessment Before mitigation D3 HIGH After mitigation C2 MEDIUM

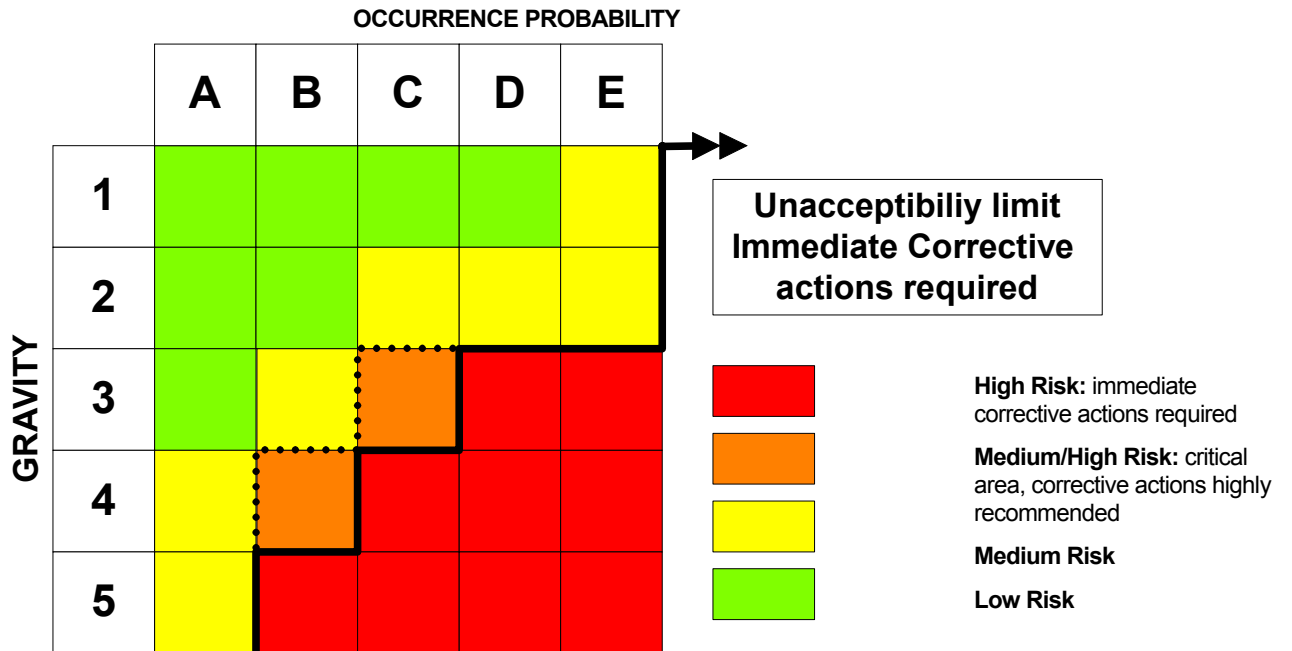
Controlled by

Procedures	Training	Inspections
WZ-VEO-SP-001-E Lock Out / Tag Out (LOTO)	OSM17 High pressure	WZ-RD-014-04-0503-E Permit To Work - High Pressure/Voltage Systems
WZ-SEO-SP-003-E Deployment and Recovery: Airguns		
WZ-SEO-SP-013-E Maintenance on board: cable oil loading		

Reviewed by: WQZ Reviewed Date: 15/02/2003

100 Utilisation Pour accéder à l'aide, appuyez sur la touche F1 NUM

APPENDIX 4 : CGG RISK MATRIX




GRAVITY				
	People	Material (USD)	Environment (Liter)	Financial/Reputation
1	Slight injury FAC	Slight damage < 1000	Slight spill < 200	Insignificant
2	Minor injury MTC + RWC	Minor damage > 1000 - 5000 <	Minor spill > 200 - 500 <	Installation Level
3	Major injury LTI	Localized damage > 5 000 - 50 000 <	Localized spill > 500 - 5 000 <	Area level
4	Single fatality	Major damage > 50 000 - 500 000 <	Major spill < 5 000 - 10 000 <	SBU level
5	Multiple fatalities	Extensive damage > 500 000	Massive spill > 10 000	Corporate level

PROBABILITY		Example
A	Never heard in the industry	Collision Seismic Vessel/platform
B	Happens in the industry	Burst of high-pressure pipe
C	Happens every year in the industry	Load falling from crane
D	Happens periodically on the crew	Cut by a sharp object
E	Happens every day on the crew	Trip and fall

APPENDIX 5 : HEALTH RISK ASSESSMENT

JOB Description	Each onboard Job Description is detailed in the database and hazards assessed depending on the position.
Hazard Type:	Either Chemical / Physical / Biological / Ergonomic Psychosocial and Organisational Hazards are listed and selected.
Causative Agents :	Agent within the previous categories are selected and assessed. Their NIOSH and ICSC numbers are displayed.
Physical Form - Exposure and target organs:	For each selected agent , specifies the form and possible route of entry in the body .
Risk assessment:	Consequence of exposure and risk assessment is explained.
Risk Rating :	Risk rating before and after mitigation using the CGG Risk Matrix.
Preventive Measures:	Procedures , Training , inspection to mitigate the risks for the said position are explained.

Compagnie Générale de Géophysique		Health Risk Assessment "HRA" Database		Menu																																																																											
Reviewed by	Dr A. Freitas, S	Code	HRA 01	Captain																																																																											
Review date	April 2006																																																																														
Job description	<p>In command of the vessel, responsible for HSE for all personnel onboard. Has overriding authority on all HSE and operational matters and over all personnel onboard, Reports to LDA vessel management. Work area is mainly bridge and office. Responsible for safe and efficient operation and management of the vessel</p>																																																																														
<div> <div>  Chemical hazards </div> <div> Captain </div> </div> <table border="1"> <thead> <tr> <th colspan="2">Causative agent</th> <th>Physical form - Exposure & Target organ</th> <th colspan="2">Risk</th> </tr> <tr> <th>CGG</th> <th>NIOSH</th> <th>ICSC</th> <th>Before mitigation</th> <th>After mitigation</th> </tr> </thead> <tbody> <tr> <td>C 13</td> <td>0105</td> <td>0023</td> <td>Carbon monoxide (CO)</td> <td>Inhalation</td> <td>Medium</td> <td>Low</td> </tr> <tr> <td colspan="6">Toxic effect of carbon monoxide: headache, tachypnea, nausea, lassitude, dizziness, confusion, hallucinations; cyanosis; angina, syncope. Heavy exposure inside relatively closed and inadequately ventilated structures may result in primary oedema, intoxication or asphyxiation.</td> </tr> <tr> <td>C 27</td> <td>?</td> <td>0059</td> <td>Diesel (Liquid and vapour)</td> <td>Liquid & Vapours:: Inhalation - Contact (skin, eye)</td> <td>High</td> <td>Low</td> </tr> <tr> <td colspan="6">Diesel is irritant to skin and eyes, it may cause dermatitis of skin; inhalation may cause headache and nausea; on prolonged exposure it may cause dermatitis.</td> </tr> <tr> <td>C 28</td> <td>0007</td> <td></td> <td>Diesel exhaust</td> <td>Fumes: Inhalation - Contact (skin, eye)</td> <td>Medium</td> <td>Low</td> </tr> <tr> <td colspan="6">Diesel exhaust may cause eyes irritation, primary function changes; on prolonged exposure it increases the risk of organic brain damage. Potentially carcinogenic.</td> </tr> <tr> <td>C 65</td> <td>0472</td> <td></td> <td>Oils, lubricants and greases</td> <td>Inhalation - Contact (skin, eye)</td> <td>High</td> <td>Low</td> </tr> <tr> <td colspan="6">1. Irritant contact dermatitis - 2. Acute Other toxic effects include: Irritation to skin, eyes and respiratory system; dermatitis of skin, headache, nausea; on prolonged exposure they may result in lung fibrosis (silicosis). Potentially carcinogenic.</td> </tr> <tr> <td>C 47</td> <td>0366</td> <td>0063</td> <td>Kerosene (Liquid and vapour)</td> <td>Inhalation - Ingestion - Contact (skin, eye)</td> <td>High</td> <td>Medium</td> </tr> <tr> <td colspan="6">Irritation eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude, restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis of skin. Prolonged exposure may cause dermatitis; chemical pneumonia.</td> </tr> </tbody> </table>					Causative agent		Physical form - Exposure & Target organ	Risk		CGG	NIOSH	ICSC	Before mitigation	After mitigation	C 13	0105	0023	Carbon monoxide (CO)	Inhalation	Medium	Low	Toxic effect of carbon monoxide: headache, tachypnea, nausea, lassitude, dizziness, confusion, hallucinations; cyanosis; angina, syncope. Heavy exposure inside relatively closed and inadequately ventilated structures may result in primary oedema, intoxication or asphyxiation.						C 27	?	0059	Diesel (Liquid and vapour)	Liquid & Vapours:: Inhalation - Contact (skin, eye)	High	Low	Diesel is irritant to skin and eyes, it may cause dermatitis of skin; inhalation may cause headache and nausea; on prolonged exposure it may cause dermatitis.						C 28	0007		Diesel exhaust	Fumes: Inhalation - Contact (skin, eye)	Medium	Low	Diesel exhaust may cause eyes irritation, primary function changes; on prolonged exposure it increases the risk of organic brain damage. Potentially carcinogenic.						C 65	0472		Oils, lubricants and greases	Inhalation - Contact (skin, eye)	High	Low	1. Irritant contact dermatitis - 2. Acute Other toxic effects include: Irritation to skin, eyes and respiratory system; dermatitis of skin, headache, nausea; on prolonged exposure they may result in lung fibrosis (silicosis). Potentially carcinogenic.						C 47	0366	0063	Kerosene (Liquid and vapour)	Inhalation - Ingestion - Contact (skin, eye)	High	Medium	Irritation eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude, restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis of skin. Prolonged exposure may cause dermatitis; chemical pneumonia.					
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WZ-RD-053-01-0306-E

APPENDIX 6 : MANUAL OF PERMITTED OPERATIONS (MOPO)

CGG Offshore has additionally identified activities which are considered safety critical and has produced the following table. This table provides guidelines as to whether an activity, which is considered to be safety critical can take place or not due to conditions or because another activity is in progress.

This MOPO is adapted and detailed in each vessel Crew HSE Plan.

Conditions	Streamer/Gun Deployment & Retrieval	Mob-boat or Workboat Operations	Passing Obstructions	Bunkering At Sea	Helicopter Operation
Hours of darkness		Not allowed			
Sea state > 2m.		Not allowed			
Sea state > 4.5m	Not allowed without EV	Not allowed	Not allowed	Not allowed	
Sea state > 6m	Not allowed	Not allowed	Not allowed	Not allowed	
Pitch, roll or heave, exceed helicopter Operation specification					Not allowed
Visibility < Cable length		Not allowed			
Visibility < 500m		Not allowed	Not allowed		
Absence of Escort Vessel		Not allowed			
MOB Boat inoperative	Only if EV or FRC available	Only if EV or FRC available			Only if EV or FRC available
Emergency training		Not allowed	Not allowed	Not allowed	Not allowed
Bunkering at sea		Not allowed	Not allowed		Not allowed
Engine or backup system on vessel inoperative due to maintenance	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed
Helicopter operations		Not allowed	Not allowed	Not allowed	

EV = Escort Vessel

APPENDIX 7 : ENVIRONMENTAL RISK ASSESSMENT EXAMPLE

Environmental Risk Assessment			Project:	ERA
Fauna	MARI	AIRG	XXXX-XXX-XXX	MARI.AIRG
Marine acquisition	<input checked="" type="checkbox"/> SBU Offshore		Deep Water marine acquisition	
Aspect	Sound level generation from airgun sources on marine mammals and sea turtles			
Activity	Energy source			
Activity specific	AIRG Airguns			
Activity causing agent	Sound level			
Environment	Fauna			
Environmental target	MARI	Marine mammals and sea turtles		
Risk assessment before mitigation measures			Medium High	
Risk Matrix	Environment		C3	Fauna
	People		-	
	Asset		-	
	Commercial/Reputation		A4	SBU level
Escalating factors		<ul style="list-style-type: none"> Disorientation and stress to one or more individuals leading to stranding Air bubbles formation in the blood stream during rapid surfacing to one or more individuals leading to permanent injury or death Death caused by one or more predators following an injury Data acquisition during breeding season in known breeding location 		
Impact assessment before mitigation measures			(P) = Primary impact (S) = Secondary impact	
<input type="checkbox"/>	Positive			
<input type="checkbox"/>	Zero impact		<ul style="list-style-type: none"> No disturbance, no avoidance, no injury and no fatality for one or more individuals 	
<input type="checkbox"/>	Negligible	S	<ul style="list-style-type: none"> One avoidance occurrence observed outside of the exclusion zone by one or more individuals 	
<input type="checkbox"/>	Adverse Not significant	S	<ul style="list-style-type: none"> Multiple avoidance occurrences observed outside of the exclusion zone multiple times by one or more individuals 	
<input checked="" type="checkbox"/>	Significant	PS	<ul style="list-style-type: none"> Abnormal behavior by one or more individuals 	
<input type="checkbox"/>	Significant unacceptable	PS	<ul style="list-style-type: none"> Injury, death or stranding to one or more individuals, in or out of the exclusion zone One or more non compliance within exclusion zone limit 	
Significance		YES	Likelihood	Happens every year
Requirements and References				
Environmental Impact Assessment (EIA)				
Contractual		OGP: Environmental management in Oil & Gas E&P (E1-2.72/254) IAGC: Environmental manual for worldwide geophysical operations		
Regulatory body		U.S. Department of the interior - Mineral Management Service – GoM NOAA Fisheries – National Marine Fisheries Service U.S. Coast Guard		
Others		MARPOL - International Convention for the Prevention of Pollution from Ships SOLAS - International Convention for the Safety of Life at Sea		



SBU Offshore HSEMS Manual

Book 2 - Annexes



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Revisions

Date	Version	Comments
07 - 2003	7	Annexes 2003
01 - 2004	8	Updated with Objectives 2004
01 - 2005	9	Updated with Objectives 2005
02 - 2006	10	Updated with Objectives 2006

Approval

	Author	Checked by	Approved by
Function	QHSE Manager	QHSE Manager	CGG Offshore SBU EVP
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Date	02 - 2006	02 - 2006	02- 2006

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Annexe A CGG Group HSE Policy



HEALTH, SAFETY & ENVIRONMENT POLICY

The CGG Group considers safeguarding the environment and preserving the health and integrity of its employees, contractors, and neighbouring communities as an absolute prerequisite to other business objectives.

CGG companies are therefore committed to improving continuously their HSE performance by :

- Promoting the conviction that all accidents can be avoided ;
- Minimising the impact of their activities on the environment and acknowledging and respecting the interests of local communities ;
- Assuring a safe and healthy workplace for their employees and the personnel of their contractors ;
- Reporting and communicating openly their HSE performance ;
- Considering industry standards and local and international regulations relating to HSE as a minimum which can be exceeded.

Acting on these commitments, CGG undertakes to :

- Demonstrate committed leadership through its line management and demand the same commitment from all its subcontractors ;
- Set and monitor ambitious and realistic HSE objectives ;
- Allocate sufficient resources ;
- Define the HSE responsibilities of every employee and provide the appropriate training ;
- Evaluate hazards, assess associated risks and establish controls and recovery measures ;
- Define and develop procedures to work safely in all circumstances, and minimise the impact of its activity ;
- Rigorously implement all HSE procedures, actively use reporting to monitor difficulties and accidents, and take corrective action to improve constantly its HSE Management System (HSE MS) ;
- Monitor its performance using audits and management review, taking necessary corrective measures.

The application of these principles by all personnel is the condition for increasing CGG's professionalism and the quality of the services it renders to its clients.

Robert BRUNCK

Chairman and Chief Executive Officer


Massy, January, 2000

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QHSE Department

Annexe B CGG Group HSE Objectives for current year



HSE OBJECTIVES 2006

2006 PRIORITIES & TARGETS

➤ **CONTINUOUS IMPROVEMENT**

No fatal accident No permanent total or partial disabilities	
• Lost Time Injury frequency (LTIF)	➔ At least 25% below 2005 results*
• Lost Time Injury & Restricted Work Case frequency (LTI+RWC) F	➔ At least 25% below 2005 results*
• Total Recordable Case frequency (TRCF)	➔ At least 25% below 2005 results*
• Seriousness Rate for the current year	➔ At least half of 2005 results
* or 0.5 if 2005 results are ≤ 0.66	

➤ **ENVIRONMENT**

- **Environmental Risk Management**
 - ➔ As of June 2006, all activities with significant potential environmental impact shall include an **Environmental Risk Assessment**.
 - ➔ **Pollution Control Plans** shall be tested **through exercises**.
 - ➔ Performance shall be monitored through a new indicator: **Environmental Disturbances frequency (ENDF)**.

➤ **HEALTH**

- ➔ **Travel Info Sheets** shall systematically include adequate Health information.
- ➔ An **avian flu Pandemic Preparedness Plan** shall be in place in all exposed countries.


➤ **HSE MANAGEMENT SYSTEM (HSEMS)**

- **Planning**
 - ➔ A **Country HSE Plan** shall be implemented in all active countries.
- **Risk management**
 - ➔ Specific programs to **mitigate the risk** of the **most hazardous activities** identified through 2005 High Potential Incidents (HPI) shall be implemented.
 - ➔ A specific Prevention Program related to **Vehicles Transport** shall be implemented for the whole CGG Group.
 - ➔ The **Crisis Management** contingency program shall be completed.
- **Auditing**
 - ➔ Specific **Security audits** shall be conducted in countries or areas with a Security Level of 2.
 - ➔ All internal audits shall be conducted in using the guidelines of the new evaluation system to assess the **HSEMS implementation**.
- **Training**
 - ➔ **HSEMS training** shall be cascaded to next management level with a target of 50% of head of departments trained.
 - ➔ 70% of **on site training modules** shall be completed and ready to use for Field Management and Operator.

All targets & objectives include the performance of our subcontractors.

Massy, January 2006

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Robert BRUNCK
Chairman & CEO

Annexe C CGG Group Environment Policy



ENVIRONMENTAL POLICY

CGG Group, as a global participant in oilfield services industry, recognizes that concern for the environment and the quality of life is an integral and fundamental part of the way in which we conduct our business. CGG Group recognizes that environmental protection is the collective responsibility of government, business, individuals and communities.

CGG Group believes that sound management of environmental issues is a key component of sound performance and development for our stakeholders.

CGG Group is therefore committed to continuous improvements in performance for environmental preservation and the prevention of pollution by undertaking the following:

Compliance:

- Establish and maintain compliance with all applicable legislation, regulatory requirements and industry standards for the protection of the environment as a minimum condition.

Relationship with Others:

- Develop and maintain open and constructive relationships with environmental groups, regulatory agencies, customers, institutions, Group employees, and communities in the countries of its activities.

Risk Management:

- Conduct project specific environmental risk assessment, consistent with ISO14001 standards, to identify and assess potential environmental impacts.
- Where potential significant impact exists, develop, implement and maintain project specific environmental management plan, with appropriate authorities, to prevent environmental disturbances.
- Develop emergency response plans for potentially major incidents to minimize their environmental impact.
- Measure environmental performance through out the life cycle of each project.

Environmental Practices:

- Promote environmental best practices within Group activities, including the sharing of experience and the continued support of research and development in environmental improvement.


Education:

- Train, inform and mobilize Group employees and contractors to ensure its activities are conducted in an environmentally responsible manner.

Management review:

- Strive to continually improve Group environmental performance by periodically review its environmental policy and integrated Environmental Management System.
- Publish information about its environmental performance as part of CGG Group annual report.

Massy, January 2006


Robert BRUNCK
 Chairman and CEO

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Annexe D CGG Group Drug & Alcohol Policy



DRUG & ALCOHOL POLICY

CGG recognises that the consumption of prohibited drugs and alcohol and other intoxicants can have a detrimental effect on the health and safety of individuals and co-workers.

All employees are expected to be in a suitable mental and physical condition to perform their duties in a satisfactory manner and to behave appropriately. They must also be in a fit condition at all times to be able to deal with any emergency situation which may arise.

It is prohibited to be under the influence of alcohol and drugs during working hours. Alcohol consumption is strictly prohibited on work sites during working hours. However, it may be authorised, in moderation outside working hours, in compliance with local laws and regulations.

An individual test for drugs or alcohol may be decided by CGG, in compliance with local laws and regulations :

- When an employee is obviously under the influence of alcohol or drugs ;
- When an employee is involved in an accident.

With a view to preventing casualties, CGG reserves also the right, subject to local laws and regulations, to carry out :

- An individual test on employees with a potentially sensitive job function, prior to the start of operations ;
- Some random testing.

Where appropriate, CGG will assist individuals in dealing with drugs and alcohol-related issues.

A handwritten signature in blue ink, appearing to read 'Brunck', with a horizontal line underneath.

Robert BRUNCK
Chairman and Chief Executive Officer

Massy, January, 2000

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Annexe E CGG Group Smoking Policy



SMOKING POLICY

CGG considers that smoking is not only harmful to health, but also represents a potential safety hazard.

CGG therefore requests its personnel to ensure that the following regulations are respected :

- Smoking is strictly prohibited on hazardous work sites where there is a risk of explosion or fire. In such places, « No Smoking » signs must be clearly posted ;
- Smoking is also prohibited in places allocated to collective usage as well as in collective means of transport, subject to no smoking restrictions set out by local legislation or specific regulations.

Furthermore, CGG encourages its personnel not to smoke, will inform them about the negative effects of smoking on health and do its best to assist personnel who smoke and wish to give up the habit.

Massy, January, 2000

Robert BRUNCK
Chairman and Chief Executive Officer

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QHSE Department

Annexe F CGG Offshore SBU - HSE Policy



OFFSHORE SBU - HSE POLICY

CGG Offshore SBU¹ is committed to continuously promote and perform services worldwide while protecting the people and the environment in which they work and live. HSE is part of our business culture and we believe that striving to continuously improve our HSE Performance is key to our business success.

We believe that all accidents, industry related illnesses and losses can be prevented.

We recognize the importance of reducing risks and we plan and perform our activities ensuring risks are assessed, controlled and kept as low as reasonably practicable.

To implement this Policy we will :

- ✓ Provide strong, visible commitment, leadership and personal involvement in HSE.
- ✓ Define the organisational responsibilities and make available the resources necessary to achieve our HSE objectives.
- ✓ Comply with applicable laws and regulations while aspiring to higher standards.
- ✓ Strive for Best in Class HSE training for all employees.
- ✓ Encourage sound HSE behaviour through dedicated awareness programs.
- ✓ Perform comprehensive risk assessment to reduce HSE risks and mitigate the impact of operations on HSE matters.
- ✓ Manage suppliers and contractors to ensure that their products and services meet applicable HSE standards.
- ✓ Ensure active participation from all employees through performance reviews, incidents reporting and inspections.
- ✓ Actively participate in Industry Initiatives.
- ✓ Monitor our performance and take actions to address deficiencies.
- ✓ Conduct Audits and reviews to verify the effectiveness of the HSE Management System.

Luc Benoit-Cattin
Offshore SBU Executive VP

¹SBU: Strategic Business Unit

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March 2006

Annexe G CGG Offshore SBU Drug and Alcohol Policy



OFFSHORE SBU - DRUG & ALCOHOL POLICY

CGG Offshore SBU¹ recognises that the consumption of prohibited drugs and alcohol and other intoxicants can have a detrimental effect on the health and safety of individuals and co-workers.

All employees are expected to be in a suitable mental and physical condition to perform their duties in a satisfactory manner and to behave appropriately. They must also be in a fit condition at all times to be able to deal with any emergency situation which may arise.

It is prohibited to be under the influence of alcohol and drugs for all CGG Offshore people and subcontractors, from the time of boarding any vessel. Therefore, alcohol and drug consumption is strictly prohibited on board vessels involved in CGG Offshore operations.


An individual test for drugs or alcohol may be decided by CGG Offshore, in compliance with local law and regulations:

- ✓ When an employee is obviously under the influence of alcohol or drugs ;
- ✓ When an employee is involved in an accident.

With a view to preventing casualties, CGG Offshore reserves also the right, subject to local laws and regulations, to carry out :

- ✓ An individual test on employees with a potentially sensitive job function, prior to the start of operations ;
- ✓ Some random testing.

Where appropriate, CGG Offshore will assist individuals in dealing with drugs and alcohol-related issues.


Luc Benoit-Cattin
Offshore SBU Executive VP

¹SBU: Strategic Business Unit
Distribution: all departments, agencies, offices and vessels for general display

April 2006

Annexe H CGG Offshore SBU Smoking Policy



OFFSHORE SBU - SMOKING POLICY

CGG Offshore SBU¹ considers that smoking is not only harmful to health, but also represents a potential safety hazard.

CGG Offshore SBU therefore requests its personnel to ensure that the following regulations are respected:

- ✓ Smoking is strictly prohibited on hazardous work sites where there is a risk of explosion or fire. In such places, « No Smoking » signs must be clearly posted;
- ✓ Smoking is also prohibited inside premises and is therefore only allowed in designated places outside premises in open deck areas where “Smoking Area” signs will be posted and specific ashtrays (fixed and closed) provided. In all other areas (corridors, mess rooms, cabins, control rooms, lounges, etc) prominent “No Smoking” signs should be posted.

Furthermore, CGG Offshore SBU encourages its personnel not to smoke, will inform them about the negative effects of smoking on health and do its best to assist personnel who smoke and wish to give up the habit.

Luc Benoit-Cattin
Offshore SBU Executive VP

¹SBU: Strategic Business Unit
Distribution: all departments, agencies, offices and vessels for general display

April 2006

Annexe I CGG Offshore SBU STOP Work Policy



OFFSHORE SBU – STOP WORK POLICY

CGG Offshore SBU¹ recognizes that the responsibility for HSE performance starts with the individuals. Each individual contracted or subcontracted by CGG Offshore is responsible for his own health, his safety and the safety of anybody around him.

In virtue of this principle, any worker may stop any task in any of the following circumstances:

- ✓ The task to be carried out contradicts CGG HSE policies.
- ✓ The method of carrying out the task contradicts CGG HSE procedures.
- ✓ The worker is not aware of the HSE procedures to carry out a particular task.
- ✓ The worker faces a serious and imminent hazard.

Any worker has the right and obligation to stop work that is unsafe.

If a worker feels entitled to implement his right to stop work in the above-mentioned circumstances, he must immediately inform his direct supervisor, so that corrective steps are taken and the work may resume.

Luc Benoit-Cattin
Offshore SBU Executive VP

¹SBU: Strategic Business Unit
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April 2006

Annexe J CGG Offshore SBU Workboat Policy



OFFSHORE SBU - WORKBOAT POLICY

Workboat operations are today essential to efficient offshore streamer seismic acquisition.

CGG Offshore SBU¹ will work to promote Workboat maintenance operations in safe conditions by developing risk assessment before each operation, increasing training, experience sharing, HSE awareness and behavior.

CGG Offshore SBU policy is:

- ✓ To give priority to durability, reliability, immunity to environmental aggression, and user friendliness of possible repair or replacement at sea, in the selection of equipment,
- ✓ To promote the efficient use of workboat to change or repair equipment at sea in the best possible safety conditions as part of towed equipment preventive maintenance policy.
- ✓ To strictly restrict the use of workboats for any other utilization through anticipation and validation of alternative solutions,
- ✓ To associate maritime expertise through the establishment of a strong partnership with ship managers for the design, maintenance, and navigation of workboats and construction of associated procedures based on share of experience.
- ✓ To actively participate in all initiatives within the industry related to improvement of safety of the workboat operations.

Luc Benoit-Cattin
Offshore SBU Executive VP

¹SBU: Strategic Business Unit

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April 2006

Annexe K CGG Offshore SBU HSE Objectives for current year



OFFSHORE SBU - HSE OBJECTIVES 2006

2006 PRIORITIES & TARGETS

➤ CONTINUOUS IMPROVEMENT

No fatal accident - No permanent total or partial disabilities	
• Lost Time Injury frequency (LTIF)	< 0.5
• Lost Time Injury & Restricted Work Case frequency (LTI+RWC)F	< 1.2
• Total Recordable Case frequency (TRCF)	< 2
• Specific targets are defined for the most hazardous activities of 3D Fleet :	
➤ Lifting & Handling (LTI+RWC+MTC) F	< 0.6
➤ Deployment & Recovery (LTI+RWC+MTC) F	< 0.3
• Specific targets are defined for the most hazardous activities of 2D/Seabed fleet :	
➤ Deployment and Recovery (LTI+RWC+MTC) F	< 1
➤ Workshops / Maintenance (LTI+RWC+MTC) F	< 1
• Health: Lost Time Medical Case Frequency	< 1.5
• Environnement: Environmental Disturbances Frequency (ENDF)	< 2

➤ ENVIRONMENT

- **Environmental Risk Management**
 - ➔ Produce an **Environmental Risk Assessment** for all surveys with potential environmental impact.
 - ➔ Improve **Environmental Performance** reporting through new-dedicated indicators including the **Environmental Disturbance Frequency (ENDF)**.

➤ HEALTH

- ➔ Deploy the Corporate Pandemic Preparedness plan for Avian Flu.

➤ HSE MANAGEMENT SYSTEM

- **Management System** ➔ Cross-fertilize HSE Management Systems within CGG and Multiwave to reach a **unified HSEMS** in 2007.
- **Risk management**
 - ➔ Implement specific **Programs** to improve the control of the most **hazardous activities**.
 - ➔ Identify **Critical Operations** and develop **Prevention Programs** and corresponding **Must Haves¹** to reach **100% compliance**.
- **Auditing** ➔ Perform **2 internal Audits** per vessel within the year.
- **Training**
 - ➔ All new personnel to receive **HSEMS Induction**.
 - ➔ Achieve **2 HSEMS Training** sessions for **Department Heads** within the year.
 - ➔ **100%** of Vessel's officers and Party Chiefs trained to **Crisis Management** within the year.

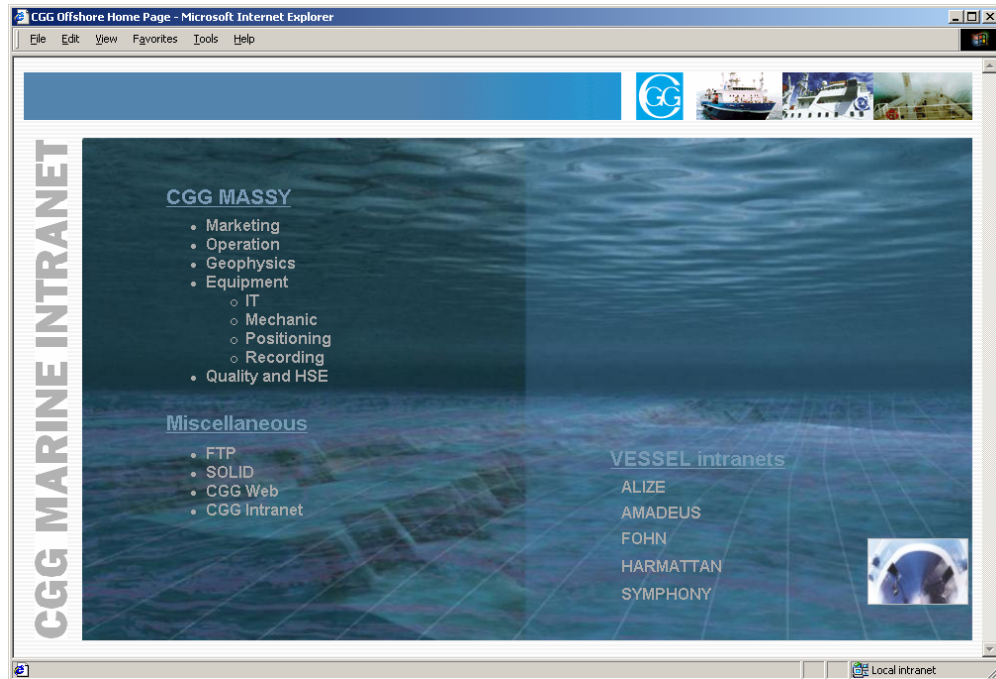
Luc Benoit-Cattin
Offshore SBU Executive VP

¹ Must Haves define critical requirements for a given process or system.
All targets and objectives include the performance of our subcontractors.
All figures are on a base of 24H per day exposure.

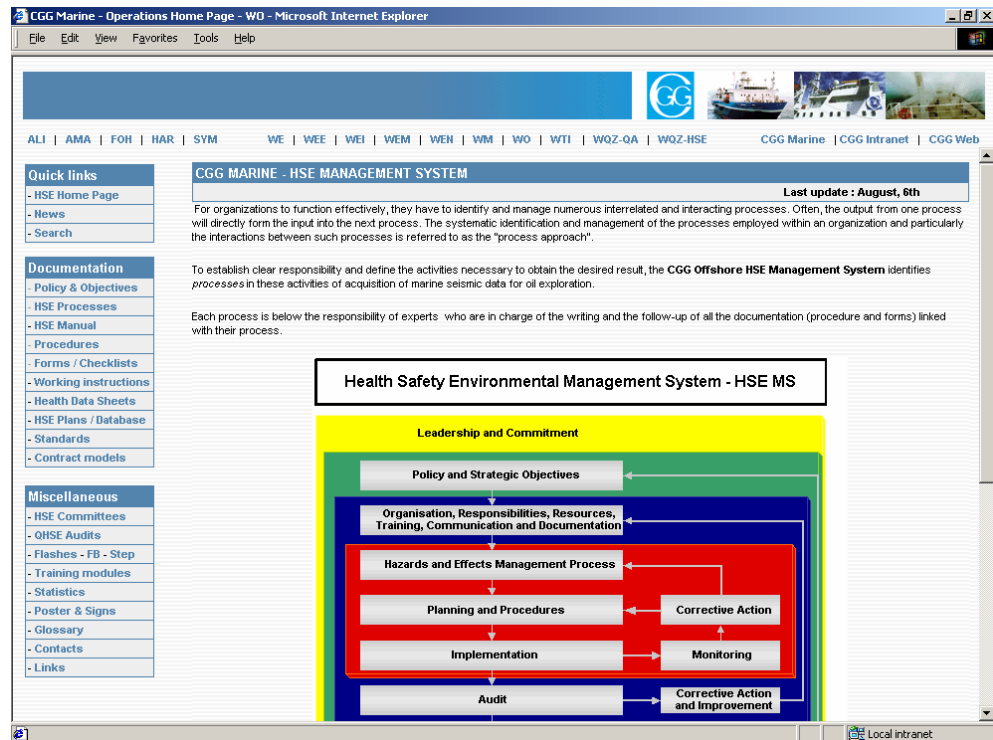
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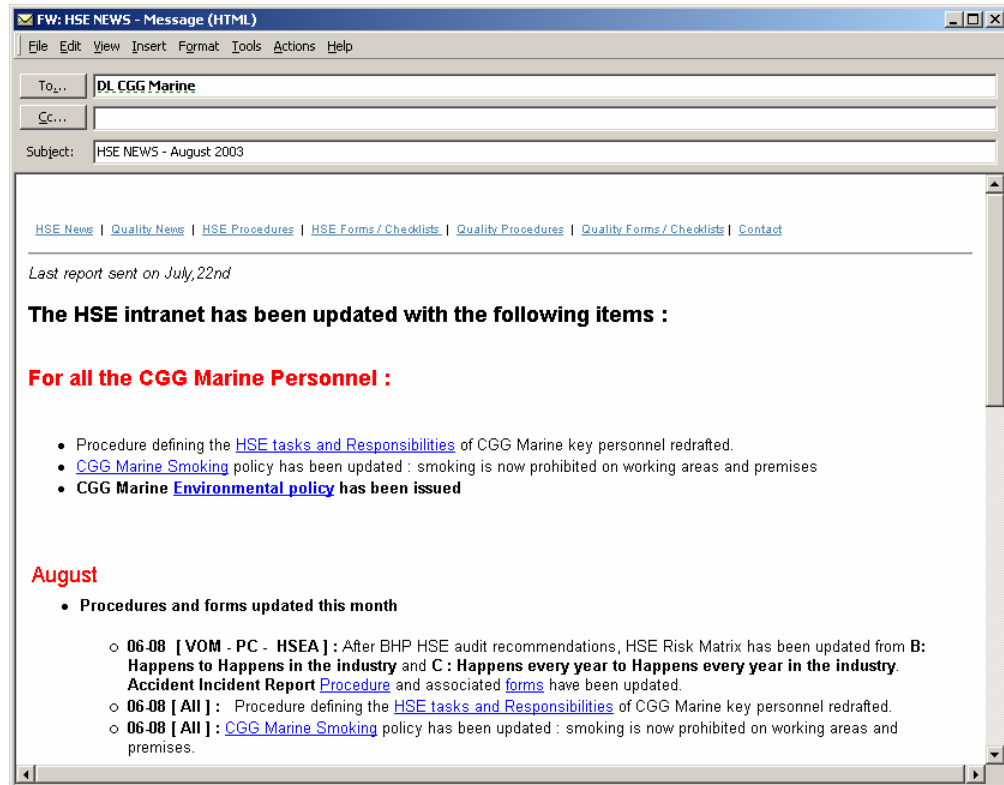
Annexe L CGG Offshore SBU - Intranet Portal



CGG Marine Intranet Portal



CGG Marine – HSE Management System Home Page



HSEMS document diffusion – e-mail + link to HSE Intranet