

CONTRACT PROJECT **SAFETY** **PLAN**



MV Pacific Titan

Australia Group Shoot **Marine 2D Seismic Acquisition Services for South** **East Basin, Offshore Australia** **CGGV Survey No 501 11 89 07 06 00**

REVISION

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07 th December 2007	1.0	Draft
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APPROVAL

CGGV Representatives			
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Date	26 th February 2008		
Signature			

CLIENT representative (s)			
Name			
Date			
Signature			

CONTENTS

1	INTRODUCTION AND PURPOSE.....	3
1.1	Purpose	3
1.2	Custodian	3
1.3	Signatories	4
2	PROJECT DESCRIPTION	5
2.1	Description / Work program	5
2.2	Special characteristics.....	7
3	MANAGEMENT SYSTEM INTERFACES.....	15
3.1	Reporting structure	15
3.2	Responsibilities and Resources	18
4	EVALUATION AND RISK MANAGEMENT.....	24
4.1	RISK Assessments.....	24
4.2	Environmental Considerations	25
5	PLANNING AND PROCEDURES.....	26
5.1	HSEMS documentation	26
5.2	Management of change.....	27
5.3	Health and Safety emergency planning	27
5.4	Safety Critical Information.....	27
5.5	Plant and Equipment control.....	28
5.6	Company/Contractor Drills.....	28
5.7	Permitted Operations	28
6	IMPLEMENTATION AND MONITORING	29
6.1	Performance Indicators	29
6.2	Incident Reporting.....	29
6.3	Incident Follow Up – Corrective Actions.....	32
7	AUDITING AND REVIEW	34
7.1	Definitions	34
7.2	Audit Plan.....	34
7.3	Reviewing.....	34
	APPENDIX 1: CGGV CORPORATE HSE OBJECTIVES 2007	36
	APPENDIX 2: CGGV CORPORATE HSE POLICY.....	37
	APPENDIX 3: CGGV SMOKING POLICY.....	38
	APPENDIX 4: CGGV SECURITY POLICY.....	39
	APPENDIX 5: CGGV D & A POLICY	40
	APPENDIX 6: CONSORTIUM MEMBERS HSE POLICIES	41
	APPENDIX 7: EMERGENCY RESPONSE.....	43
	APPENDIX 8: PROJECT HAZARD ASSESMENT	45
	APPENDIX 9: EMERGENCY COMMUNICATIONS	68
	APPENDIX 10: ACTIONS TO BE TAKEN IN EVENT OF UNAUTHORISED BOARDING	75
	APPENDIX 11: SEVERE WEATHER CONTINGENCY PLAN (CYCLONE).....	76
	APPENDIX 12: SAFE NAVIGATION AREA.....	78

1 INTRODUCTION AND PURPOSE

1.1 Purpose

This document has been prepared to fulfil the responsibilities of **consortium members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap)**, CGGVeritas and Swire Pacific Offshore with respect to identifying hazards and implementing risk control, and resolving any potential areas of conflict between their respective HSEMS. To achieve this goal, a process of discussion and review of relevant documentation and Management Systems has been completed by the parties.

This document is based on the suggested “Project HSE Plan” structure as detailed in OGP Publication “HSE Aspects in a Contracting Environment for Geophysical Operations, Schedules and Plans”, Report No. 6.92/317, May 2001, and details key aspects of the operation.

Reference should be made to the individual HSE Management Systems for details on leadership and commitment.

Reference should be made to the individual HSE Management Systems for details on Company and Contractor HSE policy. A copy of the CGGVeritas, consortium members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap) & Swire Pacific HSE policies shall be displayed on board the vessel. Where appropriate these policies will also be displayed on the accompanying chase vessels

All work shall be in line with the strategic objectives set out in the CGGVeritas annual HSE Objectives (Appendices 1 to 2).

The vessel Master has overall responsibility for safety on the vessel and is directly accountable to the vessel Managers. The Party Chief has responsibility for the implementation of the CGG HSEMS on the acquisition site.

1.2 Custodian

The template of this document is drafted and verified by the HSE Department. It is then made available to the possible users, through different means according to the needs (server, intranet site, directly sent...).

The first version is issued at tender stage by the CGGVeritas Account Manager

After client award, and for HSE preparation, this version is transferred to the Vessel Operation Manager for updates, modifications if necessary

After verification by the HSE Department, the document is approved by the Vessel Operation Manager, who presents it to the concerned crew and is responsible for implementation for the duration of the survey.

The document is then kept onboard by the Party Chief & Chase vessels Masters who becomes its custodian.

1.3 Signatories

During the survey, any required modification implies update of the HSE Plan (with new version number) with the same validation cycle than explained in previous paragraph.

The Project HSE Plan shall be signed by the personnel detailed below and a copy distributed to Consortium Members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap) Project Manager, the CGGVeritas Project Manager and the Swire Pacific Project Manager:

MV Pacific Titan:

Consortium Members on site Representative (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap).

Date: _____

Name: _____

Signature: _____

Party Chief

Date: _____

Name: _____

Signature: _____

Vessel Captain

Date: _____

Name: _____

Signature: _____

Chase Vessel Captain

Date: _____

Name: _____

Signature: _____

2 PROJECT DESCRIPTION

2.1 Description / Work program

All consortium members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap) and CGGVeritas have come to an agreement for shooting multiple 2D seismic surveys program located offshore in southern Australia waters. The Consortium Members wish to acquire exploration 2D marine seismic surveys over permits as per below in the Otway, Sorrell, Bass and Gippsland Basins located in and adjacent to Bass Strait, offshore southern Australia during 2008.

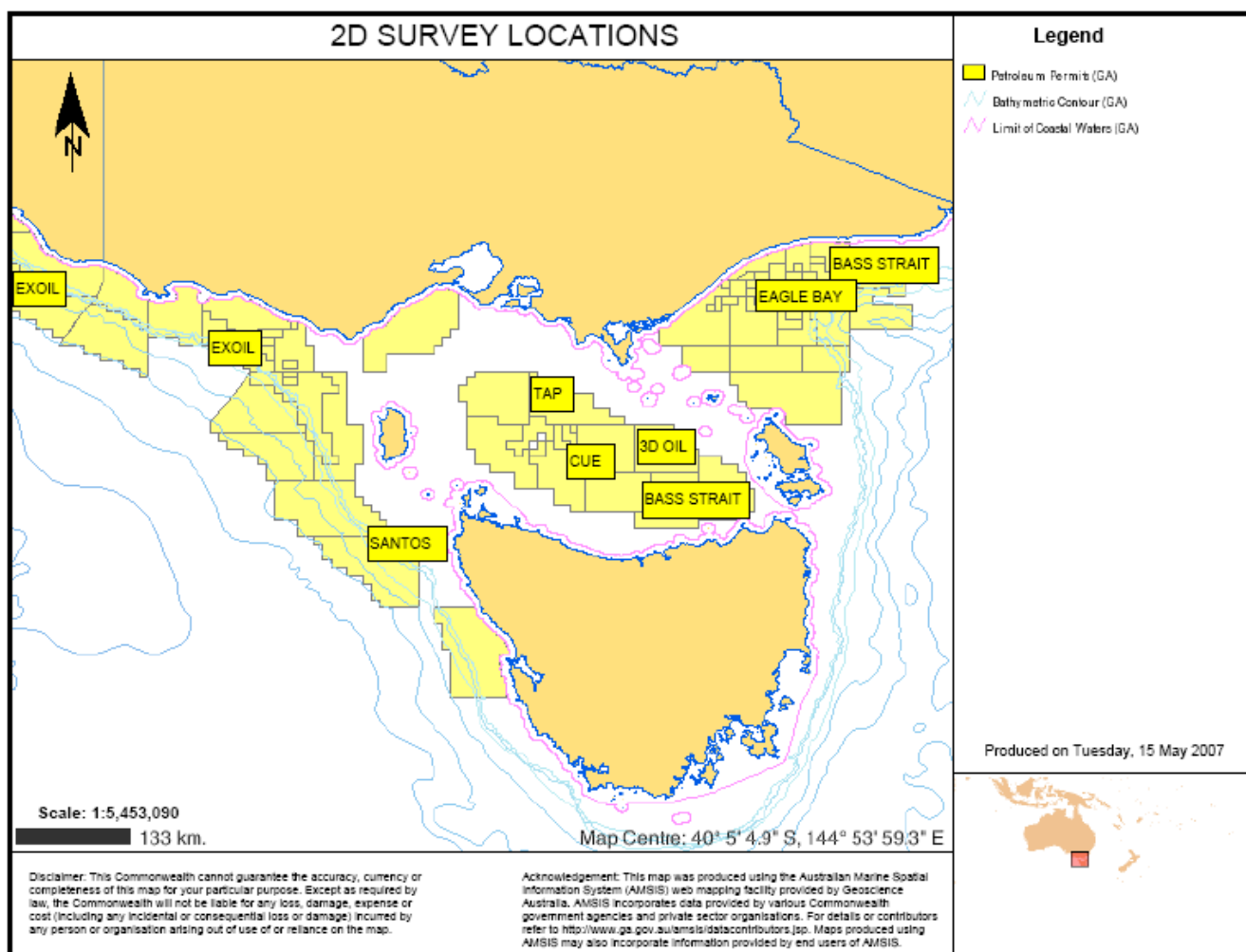
The maximum area of full fold coverage required is 9,115 Kms as shown on the map below. Water depths vary slowly across the survey area and are between 2000m and 10m.

Location	South East basin
CGGV Project Code	501.11.89.07.06.00
Project	859832 SEBOA

The seismic vessel proposed to complete the program is: M/V PACIFIC TITAN

► Parameters of acquisition are 1 streamer x 6 000 meters length

Location of permits.



SUMMARY OF PROGRAMS

OPERATOR	2D MGP	Block	Nber of Lines
• 3D Oil	2200	T41P	55
• Bass St	250	VICP41	14
• Bass St	1100	T42/43P	17
• Cue Energy	3660	T37/38P	110
• Eagle Bay	300	VICP65	13
• ExOil	1132	EPP34	25
• ExOil	1000	VICP61	33
• Santos	730	T48P	16
• Tap	533	T47P	23

TOTALS **10900 Kms** **307 lines**

If survey vessel enters area from the west the acquisition sequence will be

OPERATOR	Block
• Santos	T48P
• Tap	T47P
• Cue	T37/38P
• Exoil	EPP34
• Exoil	VICP61
• 3D Oil	T41P
• Bass Strait	T42/43P
• Bass Strait	VICP41
• Eagle Bay	VICP65

Operational means:

The M/V Pacific Titan will acquire the entire 2D program

One chase vessel will act as support vessel on surveys T48P (Santos) on 02nd of March and EPP34 - VICP61 (Exoil) on indeterminate date.

The all surveys should last around 140 days / 20 weeks.

Operations planning

The mobilization will take place around 02nd - 03rd of March 2008. Pacific Titan should also do the clearance for Australia in Burnie - Tasmania.

2.2 Special characteristics

The surveys EEPP34 & VICP 61 are located around 70Nm – 110 Nm from Portland, the surveys T48P, T47P, T37/38P and T41P are located around 70Nm to 200Nm from Melbourne or Burnie, the surveys VICP41 and VICP65 are located around 70Nm to 150Nm from Eden. The water depths vary from 10m to 2000m.

2.2.1 Weather and Sea Conditions

The project is to be undertaken between February and May 2008.

- The period Feb-May is the end of the Australian summer and coming into winter.
- Seas can be expected to be anything from light to very heavy.
- The southern coasts of Australia, in particular the west coast of Tasmania and the Bass Strait region can experience extreme weather at any time throughout the year.
- Cyclones or tropical depressions in this area are not expected, but weather conditions in the Bass Strait are consistently marginal over the year and cyclone patterns have been unpredictable in the last decade.

Waters are transitional warm to cold temperate, with mean sea surface temperatures varying from 14°C in winter to 19°C in summer. The coastline is typically high energy, with high deepwater wave energy, attenuated by a steep offshore-near shore gradient and offshore reefs which provide for moderate to low energy conditions. Tidal range is small ranging from approximately 0.8 to 1.2 meters range.

Further information on procedures to be followed in the event of severe weather being encountered is available in Appendix 11 of this plan.

2.2.2 Acquisition of Shallow Water Lines

The 2D program is in water depths of greater than 10m with no known obstructions generally. However the T/48P (Santos) program has a number of shallow shoals located within the survey area and adjacent the coasts near vessel run outs and turns. Careful chart review will be necessary to identify these hazards. A chase vessel may be required to scout some sections of lines and turns to ensure the route is free of obstruction.

2.2.3 Maritime Activity

Bass Strait in general is a busy shipping route. The main shipping channel through Bass Strait is used by over 1000 vessels every year. The lesser route of Portland to Northern Tasmania will experience over 500 vessels each year.

2.2.4 Boarding By Activists/Pirates

No activity by activists or pirates is expected. For project procedures regarding such events refer to Appendix 10.

2.2.5 Oil Field and Platform Activity

The area where these 'surveys' are to be carried out is in the confines of numerous oil rigs/platforms, both manned and unmanned. Any interaction with oil rigs/platforms in a survey area will be managed by the individual consortium company whose survey is affected.

2.2.6 Fishing Activity

Some fishing vessels are anticipated in the area. However, they are contactable via VHF channel 16 or mobile phones. They are usually trawlers or vessels using drop lines.

Some consortium members may contract a local fishing vessel to support the survey vessel if fishing activity is deemed significant. Close cooperation will be implemented to ensure minimal impact on seismic and fishing operations.

2.2.7 Marine Parks and Reserves

No Marine Parks and Reserves on all surveys area.

2.2.8 Military area

At time of preparing this document no information was available from the Federal Defense Forces in Canberra to identify any planned military activity during the timing of this project. Should information come to light to indicate changes to this, the information will be forwarded to all parties and this document shall be revised.

If any unidentified hazards present themselves, the onboard personnel will assess each hazard accordingly and procedures will be developed immediately to reduce the associated risks to as low as reasonably practical. Such procedures will be in the immediate form of a Job Safety Analysis (JSA), followed up with a Risk Assessment procedure.

2.2.9 Port Calls and Crew Changes

It is expected that all crew change will be performed at Portland - Victoria, Burnie - Tasmania, Melbourne - Victoria or Eden - Victoria. Any port calls that may occur during the survey will be utilized for replenishment of stores and any on going vessel maintenance.

Inward clearance formalities should be completed at Burnie - Tasmania.

2.2.10 Port Security

The vessel is using the **International Ship and Port Security** code (ISPS) and the **Port Security** (MARSEC) level in transit and port time.

Port Security levels (MARSEC) will be determined by the port authority under ISPS guidelines. Port security is of an acceptable standard for all International Ports within Australia, and meets with the requirements of CGGV and Swire. The port is regularly patrolled by port security and as such there are no known threats with regards to the security and safety of the vessel.

Upon arrival at any port the Pacific Titan will position a vessel gangway watch at the foot of the gangway to sign on and off all visitors to the vessel. A brief induction will be given to all such visitors, and they will not be invited onboard until a suitable escort has been arranged for them.

2.2.11 Sharks

Sharks are known to be in the area and have attacked seismic equipment. The work/MOB boat will not be launched (other than emergency) when sharks have been sighted. Work boat crews should avoid putting brightly reflective items, e.g. tools or wrist-watches, in or near the water during maintenance. If a crew member fell in the water, he would benefit by having no shiny items on his clothing and by refraining from thrashing around unnecessarily.

2.2.12 Waste Management

The CGGV waste management procedure will be followed as this is in line with the guidelines of MARPOL 73/78 and Swire procedures.

- All food scraps will be macerated to a size of less than 25 mm before discharge over the side.
- Only biodegradable food scraps are to be dumped over the side and not within 12 nautical miles of any charted reef or coastline. No other materials are to be dumped.
- The vessel's sewage treatment system ensures that sewage is macerated to a small particle size, and is treated to neutralize bacteria.

- Waste oils are to be held in the waste oil tank and pumped ashore to a reputable contractor for disposal.
- A drip tray is in place around the streamer working area to trap leaking cable fluid, which is drained from this tray to the waste oil tank.
- Solid waste is to be compacted and held in the garbage skips on board for disposal ashore by a reputable contractor
- A standard procedure is in place for the disposal of lithium batteries.
- For further information with regards to waste management please refer to the vessel Safety Case and the Swire SMS documentation.

2.2.13 Environment:

MANAGEMENT MEASURES FOR ORGANISATIONS/VESSELS CONDUCTING SEISMIC SURVEYS IN AUSTRALIAN WATERS

These measures are divided into the following parts:

Safety Zones: defines the Observation, Low power and Shut-down zones to be used based on the likely sound levels surrounding the seismic sound source(s). These safety zones are to be used in the operational procedures that follow.

Management Procedures: defines the operational procedures which should be used when planning and carrying out seismic surveys. These include:

- A. Standard Management Procedures which should be followed by all vessels conducting seismic surveys in Australian waters irrespective of location and time of year so as to avoid interfering with or having a significant impact on whale species. These procedures should be sufficient in areas which can be demonstrated, by available evidence, to have a low probability of encounters with whales.
- B. Additional Mitigation Procedures which are designed to further minimise any possible impacts on individual animals or populations. These procedures may be employed in areas and/or seasons which have a moderate to high probability of encountering whales. These procedures are of particular importance in considering a seismic survey proposed to take place in a biologically important habitat.

SAFETY ZONES

Different seismic surveys will have varying acoustic propagation characteristics depending on many characteristics including the seismic array used, bathymetry of the survey area and temperature profile of the water column.

Safety zones should be delineated based on the sound levels whales are likely to receive. For example, a seismic air-gun array operating in shallow water will likely have much quicker attenuation of sound energy compared to a similar array operating in deep water. Accordingly, a survey producing lower sound levels as one ranges further from the seismic vessel should be able to operate with smaller safety zones than a survey that produces higher levels at similar ranges.

For proposed seismic surveys that can demonstrate through sound modelling or empirical measurements that the received acoustic signal at 1km will not likely exceed 160dB re 1µPa •s for 95% of the time, the following safety 2 zones are recommended:

- ✓ Observation zone: 3+ km horizontal radius from the acoustic source.
- ✓ Low power zone: 1 km horizontal radius from the acoustic source.
- ✓ Shut-down zone: 500m horizontal radius from the acoustic source.
- ✓ For all other proposed seismic surveys:
- ✓ Observation zone: 3+ km horizontal radius from the acoustic source.
- ✓ Low power zone: 2 km horizontal radius from the acoustic source.
- ✓ Shut-down zone: 500m horizontal radius from the acoustic source.

See Diagram 1 below for an illustration of these zones. In the observation zone whales and their movements should be monitored to determine whether they are approaching or entering the low power zone. When a whale is sighted within or appears to enter the low power zone, the acoustic source should immediately be powered down to the lowest possible setting (e.g. a single small gun firing at ~10s intervals). When a whale

is sighted within or appears to enter the shut-down zone, the acoustic source must immediately be shut down completely. Use the above values for application of both the Standard Management and Additional Mitigation Procedures outlined below.

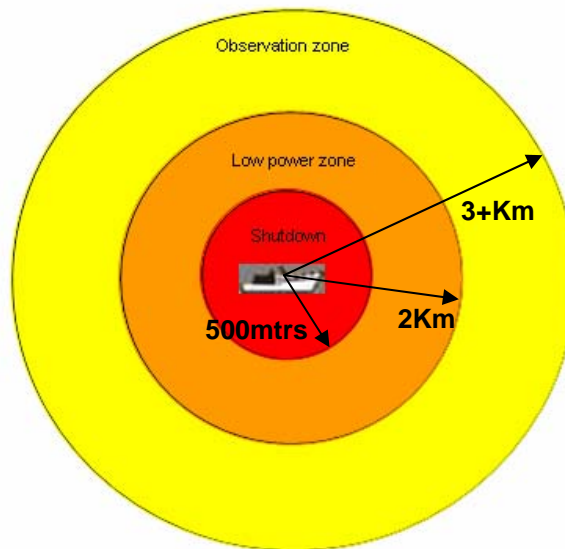


Diagram 1

MANAGEMENT PROCEDURES:

A. STANDARD MANAGEMENT PROCEDURES

These procedures should be followed by all seismic vessels conducting surveys in Australian waters irrespective of location and time of year.

Applicable Species: Due to the difficulties in identifying whales to the species level, particularly at distance, the following Standard Management Procedures should be applied whenever whales (including the larger Delphinidae species such as Killer whales, false killer whales and Pilot whales) are encountered. Other (smaller) dolphins and porpoises that have peak sensitivities in the higher frequency ranges are likely to be less disturbed by these lower frequency sounds and less vulnerable to acoustic trauma. Accordingly, these Management Procedures do not apply to encounters with the smaller dolphins and porpoises. If there is doubt, precaution should be shown and the procedures outlined below should be applied.

A.1. PRE-SURVEY PLANNING

Do not program seismic surveys in areas where and when whales are likely to be breeding, calving or resting. If proposed, these surveys and associated mitigation measures will need careful consideration and may require further assessment under the EPBC Act.

Example: The endangered southern right whale breeds and calves at particular sites along the coast of southern Australia, such as the Head of the Bight, SA and near Warrnambool, Vic, in the winter months. Seismic surveys should be planned to avoid such areas and times, or at a minimum demonstrate that the measures to be employed will not have an impact on animals at important times, this may include application of all or some of the measures outlined in the Additional Mitigation Procedures. The Recovery Plans for Australia's Threatened Whales (Humpback, Southern Right, Blue, Fin and Sei) 2005 contain detailed information on important habitat areas.

When planning seismic surveys, avoid where possible areas where and when whales are known or are likely to be migrating or feeding. Should it be necessary to conduct seismic surveys in areas where and when whales are known or are likely to be migrating or feeding then additional measures (Additional Mitigation Procedures) to ensure that impacts and interference are avoided and/or minimised are necessary. Details of the measures to be applied should be included in any Referral submitted under the “EPBC Act Policy Statement 2.1 – Interactions Between Offshore Seismic Exploration and Whales (DEW, 2007e)”

Further environmental assessment of potential impacts may also be necessary if multiple seismic sources (e.g. Two vessels on one project or multiple, adjacent projects) are to be operated in the same general area. Operators proposing to conduct seismic surveys should liaise with government and industry bodies to ensure that surveys do not unnecessarily coincide or overlap.

The organisation conducting the seismic survey should prepare an environmental management plan for the survey that details the management and operational measures that will apply throughout the survey to detect whales and avoid interference or significant impacts. The plan and measures employed should be based on the likely presence and probability of encountering whales during the survey.

If during the operation of the survey the number of sightings/power-downs of whales are higher than were anticipated during the planning of the survey or the timing of the survey alters, the organisation conducting the survey should contact the Department to determine if additional management measures should be employed.

A.2. TRAINED CREW

The organisation conducting the survey should ensure that there is sufficient trained crew to fulfil the basic requirements outlined below. The trained crew members must have proven experience in whale observation, distance estimation and reporting.

A briefing should be provided to all crew on board the survey vessel (and any supporting craft) on environmental matters, including information on this Policy, whale identification and the environmental legal obligations for companies operating in Australian waters.

Where possible, provide reference material, including this Policy, the Department's Whale and Dolphin sighting report form and the APPEA CD Guide Search Australian Whales and Dolphins and provide appropriate visual aids, such as binoculars, on board the vessel to aid in the identification and reporting of any whales sighted.

A.3. DURING SURVEYS

All seismic survey vessels operating in Australian waters must undertake the following basic procedures during surveys irrespective of location and time of year of survey:

- Pre start-up visual observation
- Soft start
- Start-up delay
- Operations
- Power- down and Stop work

These procedures are defined and described in greater detail below.

A.3.1 Pre Start-up-Visual Observation

During daylight hours, visual observations (using binoculars and the naked eye from the bridge on the survey vessel or preferably a higher vantage point) for the presence of whales should be undertaken by a suitably trained crew member for at least 30 minutes before the commencement of the soft start procedure. Observations should, where visibility allows, extend to 3+ km (observation zone) from the vessel but with particular focus on the low power and shut-down zones around the acoustic source - see Diagram 1.

During these 30 minute observations, the observer should make observations around the whole of the vessel (360°) and towed array out to a 3km distance and, if possible, beyond 3kms.

A.3.2 Soft Start (or ramp-up)

If no whales have been sighted within the low power and shut-down zones during the pre start-up procedure, the soft start procedure outlined below may commence.

Ramp-up or **soft start** procedures should be used each time the acoustic sources are initiated, gradually increasing power over a 30-minute period. Initiate ramp-up procedures by firing a single airgun. The preferred airgun to begin with should be the smallest airgun, in terms of energy output and volume. Additional acoustic source components should gradually be added in sequence until operating level is achieved. The full power operating level should be the minimum acoustic energy output that is necessary to achieve the survey's objectives.

A sequential ramp-up of the acoustic source is considered to be industry best practice. The slow increase in acoustic energy may alert whales in the area to the presence of the seismic array and enable animals to move and avoid (or stand off) at distances where injury is unlikely.

Visual observations by trained crew should be maintained continuously during soft starts to identify any whales within the safety zones.

At night-time or at other times of low-visibility (e.g. during fog or periods of high winds), start up may be commenced:

- provided that there have not been 3 or more whale instigated power-down or shut-down situations during the preceding 24 hour period; or
- if operations were not previously underway during the preceding 24 hours, the vessel (and/or a spotter vessel or aircraft) has been in the vicinity (approx 10km) of the proposed start up position for at least 2 hours (under good visibility conditions) and no whales have been sighted.

All other procedures outlined above should be applied during night-time surveys.

A.3.3 Start-up Delay Procedure

If a whale is sighted within the 3km observation zone during the soft start the operator of the acoustic source will be placed on stand-by to power down the acoustic source. An additional trained crew member or marine mammal observer should also be brought to the bridge to continuously monitor the whale whilst in sight. If a whale is sighted within or is about to enter the low power zone, the acoustic source should be powered down to the lowest possible setting (eg. a single gun). If a whale is sighted within, or enters the shut-down zone, the acoustic source should be shut down completely.

Soft start procedures should only resume after the whale has been observed to move outside the low power zone, or when 30 minutes have lapsed since the last whale sighting.

A.3.4 Operations Procedure

Trained crew should undertake visual observations continuously during survey operations.

Operators are encouraged to turn off arrays when not collecting data, or ramping up. Discharge of the acoustic source may be continued during line turns, changes, or other practical operational needs, although the acoustic source should be powered down to the lowest possible setting.

The firing of a single gun during turns is an industry standard and is generally considered a reasonable precaution. This sound source may alert whales in the area to the presence of the seismic array and reduce chances of entanglement or contact.

When the array has been completely shut down observations for whales should continue. If no whales are sighted during the shut-down period then start-up should commence using the soft start procedures. If whales are sighted during shut down or if observations for whales ceased, then start-up should not begin until pre start-up visual observations have been conducted.

Night-time or low-visibility operations may proceed provided that there have not been 3 or more whales instigated power-down or shut-down situations during the preceding 24 hour period. Where conditions allow, observations to spot whales should be maintained with a particular focus on the low power and shut-down zones. If whales are detected then operations should stop until visibility improves.

If sightings of whales have been frequent or are higher than were anticipated during the planning of the survey, the operator of the survey should contact the Department to discuss appropriate night-time provisions and whether additional management measures should be employed for day and/or night-time operations.

A.3.5 Stop Work Procedure

If a whale is sighted within the 3km observation zone the operator of the acoustic source will be placed on stand-by to power down the acoustic source. An additional trained crew member or marine mammal observer should also be brought to the bridge to continuously monitor the whale whilst in sight.

If a whale is sighted within or is immediately approaching the low power zone, the acoustic source should be powered down to the lowest possible setting. If a whale is sighted or enters within the shut-down zone, the acoustic source should be shut down completely.

Power-up of the acoustic source with soft-start procedures should only occur after the whale has been observed to move outside the low power zone, or when 30 minutes have lapsed since the last whale sighting.

A.4 COMPLIANCE AND SIGHTING REPORTS

It is the responsibility of the organisation undertaking a seismic survey to maintain a record of procedures employed during operations. Such records should be auditable and account for aspects of the operation as it relates to legislative approvals and regulations. Additionally, information on any whales (or other species) sighted during the survey may be useful in the planning and assessment of future marine industry activities.

A report on the conduct of the survey, and any whale interactions, should be provided to the Department within two months of survey completion. The report should at a minimum contain:

- the location, date and start time of the survey;
- name, qualifications and experience of any Marine Mammal Observers (or research scientists) involved in the survey;
- the location, times and reasons when observations were hampered by poor visibility or high winds;
- the location and time of any start-up delays, power downs or stop work procedures instigated as a result of whale sightings;
- the location, time and distance of any whale sighting including species where possible; and
- the date and time of survey completion.
- Any whale sightings should be recorded on a sightings form (approved by the Director, Ports and Marine Section). An example reporting form for cetaceans sightings is available online at:

For individual sightings:

http://aadcmapping.aad.gov.au/aadc/whales/report_sighting.cfm

For multiple sightings:

http://aadcmapping.aad.gov.au/aadc/whales/Whale_and_Dolphin_sightings_report_summary_v2.xls

The Report and completed sighting forms should be emailed to

portsandmarine@environment.gov.au or posted to:

Director
Ports & Marine Section
Approvals and Wildlife Division
Department of the Environment and Water Resources
GPO Box 787
CANBERRA ACT 2601

B. ADDITIONAL MITIGATION MEASURES

For seismic surveys operating in areas where the likelihood of encountering whales is moderate to high the application of additional measures to ensure that impacts and interference are avoided and/or minimised are necessary. The following measures are recommended, however, application of all these measures may not be necessary, applicable or possible for all seismic survey operations. In planning a seismic survey, operators should consider which of these measures best apply to their circumstances. Details of the measures to be applied should be included in any referral submitted under the EPBC Act.

B.1 Marine Mammal Observers (MMO)

As the likelihood of encountering whales increases, proponents should engage MMOs. MMOs should be trained and experienced in whale identification and behaviour, distance estimation, and be capable of making accurate identifications and observations of whales in Australian waters. The MMOs should assist other observers (e.g. trained crew), and be available to provide advice should whales be encountered.

B.2 Night-time/Poor visibility

For surveys in areas where whales are expected to be encountered, operators should include appropriate management measures to detect (or predict) whale presence and apply measures to reduce the likelihood of encounters. Depending on the situation a range of measures may be appropriate, possible measures include:

- Limiting initiation of ramp-up to conditions that allow visual inspection of the safety zone;
- Daylight spotter vessel or aircraft searches of the night-time survey area to determine if whales are present; and
- Pre survey research (including surveys) to detect and identify likely whale concentration areas, such as: peak migration paths and times, key feeding sites (e.g. shelf breaks, sea mounts and trenches), or other aggregation areas.

B.3 Spotter Vessel(s) and Aircraft

Where the likelihood of encountering whales is high, spotter vessels/aircraft could be used to assist in detecting the presence of whales. Spotter vessels and aircraft may be usefully employed to determine the presence and likelihood of encountering whales during day and night-time operations, information that can then be used to re-design the survey or tracks to be run to avoid whales that are in the vicinity. Spotter vessels/aircraft should maintain continuous contact with the seismic survey vessel. An MMO should be employed on board both the vessel and aircraft.

B.4 Increased Safety zones and Buffer zones

In some locations and circumstances it may be advisable to apply increased distances for the instigation of power-down procedures than those outlined in Part A. For important habitats, such as feeding areas, when concentrations of food and whales are likely to occur, an increased low power zone (e.g. 3km) may be appropriate to ensure that disturbance or displacement of whales does not occur. Such a measure may not need to apply for the whole of the survey (time and area) but may be advisable for particular specific locations (e.g. along the shelf edge where food sources are most likely to occur).

For surveys being undertaken in the broad vicinity of known breeding or resting areas, a buffer (exclusion) zone should be established to ensure that operating survey vessels do not enter the vicinity where whales may be present.

The size of the buffer zone should be established on a precautionary basis. Where available, scientific evidence and/or acoustic propagation modelling should be used to determine and justify the buffer zone.

B.5 Passive Acoustic Monitoring

Passive acoustic monitoring (PAM) is an emerging technology that has some limitations. Deployment of PAMS with appropriate technologies and programs to detect whales in real time may provide an additional method of detecting and avoiding whales during surveys and may be particularly useful during night-time and low visibility operations. The use of PAMS as a detection tool should be considered by survey operators and, if deployed, details should be provided on their intended use as part of any Referral.

3 MANAGEMENT SYSTEM INTERFACES

3.1 Reporting structure

Full details of the CGGVeritas and the Consortium Members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap) management structure are shown in the relevant HSE Management Systems.

Operational interfaces for office and survey vessel are shown below:

Reference is made to CGGVeritas Emergency Response, Operational & HSE interfaces which are shown below:

Primary Emergency response reporting for Consortium Members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap Oil) are listed below

Relevant contact numbers are shown in the accompanying Medevac procedure and in appendix 7 of this document.

Santos Contact

Santos	Primary Contact:	Mr Andrew White
Santos	Secondary Contact:	Mr Mike Giles
Santos	Tertiary Contact:	Mr Stuart Brew

Exoil Contact

Exoil	Primary Contact:	Mr Franck Renton
Exoil	Secondary Contact:	Mr James Willis

3D Oil Contact

3D Oil	Primary Contact:	Mr Franck Renton
3D Oil	Secondary Contact:	Mr Jon Keall

Bass Straits Oil Company Contact

Bass Straits Oil Company	Primary Contact:	Mr Franck Renton
Bass Straits Oil Company	Secondary Contact:	Mr Keith Jackson

Cue Energy Resources Contact

Cue Energy Resources	Primary Contact:	Mr Franck Renton
Cue Energy Resources	Secondary Contact:	Mr Desmond Leech

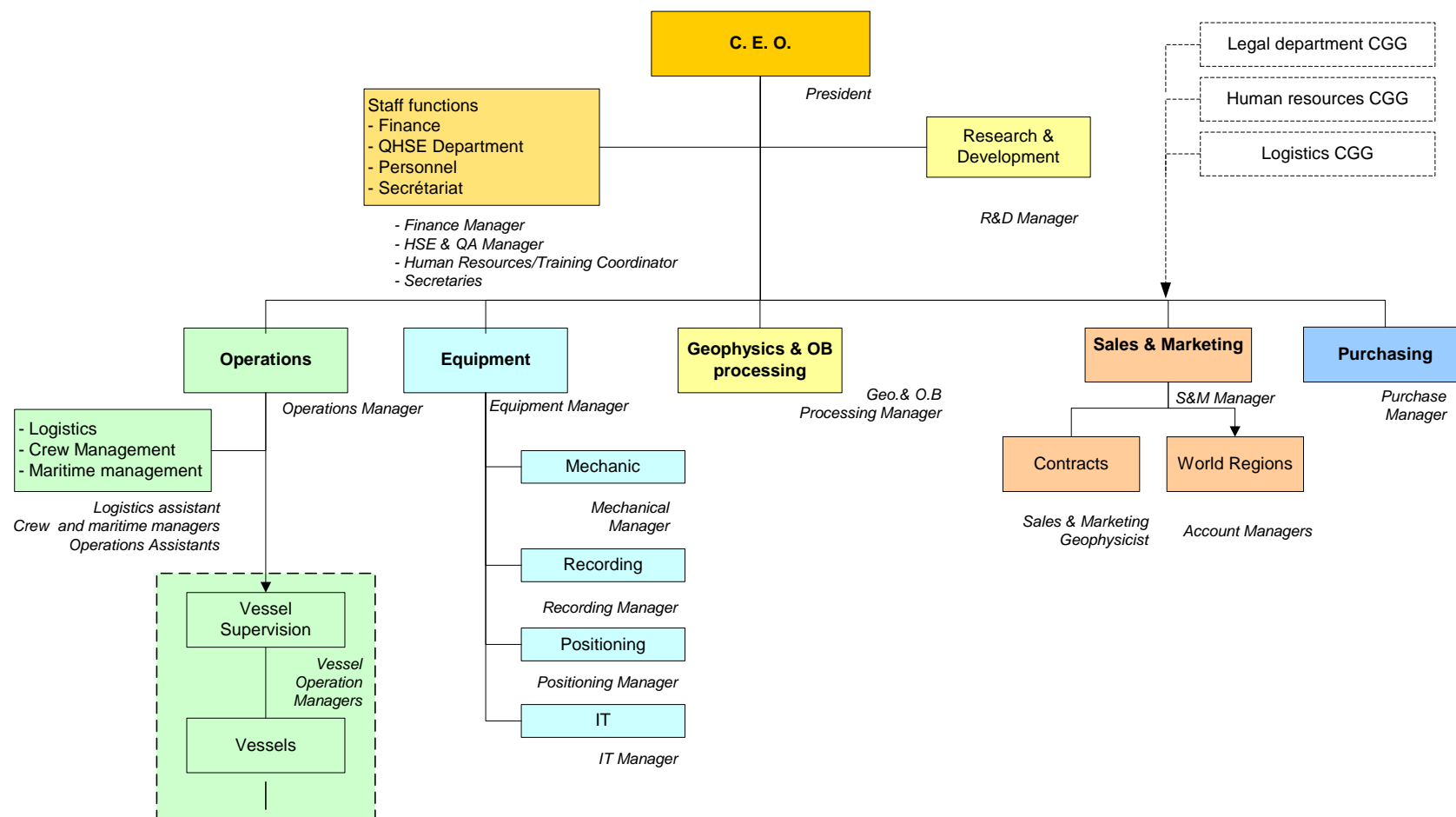
Eagle Bay Resources Contact

Eagle Bay Resources	Primary Contact:	Mr Franck Renton
Eagle Bay Resources	Secondary Contact:	Mr Ian R. Barr

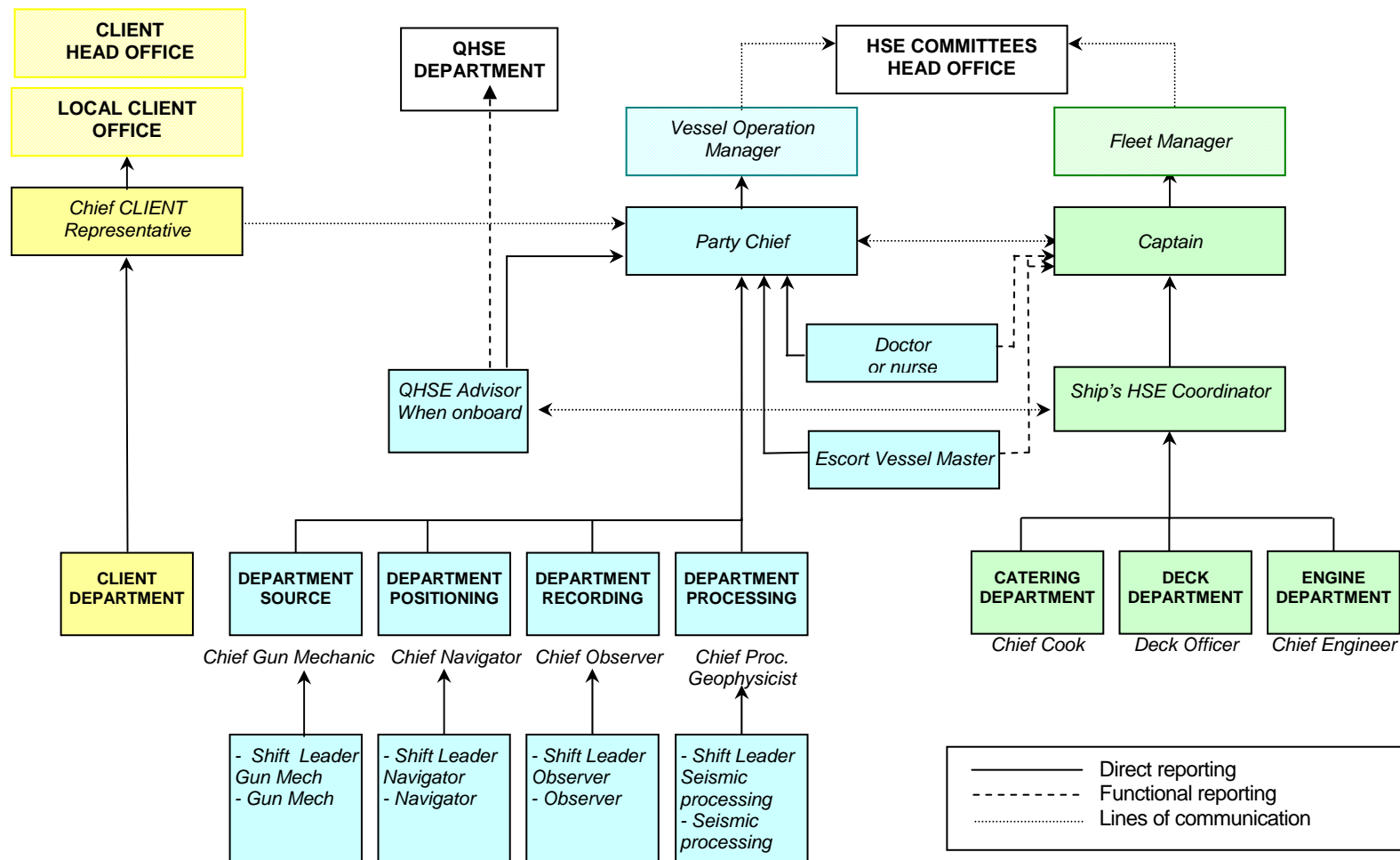
Tap Oil Contact

Tap	Primary Contact:	Mr Franck Renton
Tap	Secondary Contact:	Ms Denise Long
Tap	Tertiary Contact:	Mr John Thornton

3.1.1 CGGVeritas General HSE organisation



3.1.2 HSE organisation



3.2 Responsibilities and Resources

3.2.1 Statement for all crew

The following HSE management role is expected from every member of the crew:

- To comply with CGGVeritas & Consortium Members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap) HSE procedures as well as local & national legal regulations,
- To take care of his/her own health & safety at work and not to endanger others,
- To develop personal awareness of HSE matters on the crew and to report to immediate supervisors any shortfalls in, or non-compliance with procedures.
- To report any accident, near misses or dangerous occurrence,
- To ensure he/she is familiar with standard emergency instructions such as fire safety, first aid, boat drill, MOB drill and the emergency response plan,
- Not to intentionally or recklessly interfere with or misuse anything provided in the interests of Health, Safety and Environmental protection,
- To apply the Refusal to Work Policy.

An overview of support personnel is provided below:

Consortium Members	Santos
Contact Manager	Mike Giles
Acquisition Project Manager	Andrew White
HSE Manager	Nick Fox
Exploration Manager	Neil Tupper
Consortium Members	3D Oil
Acquisition Project Manager	Frank Renton
HSE Manager	
Exploration Manager	Jon Keall
Consortium Members	Bass Straits Oil Company
Acquisition Project Manager	Frank Renton
HSE Manager	
Exploration Manager	Keith Jackson
Consortium Members	Cue Energy Resources
Acquisition Project Manager	Frank Renton
HSE Manager	
Exploration Manager	Desmond Leech
Consortium Members	Eagle Bay Resources
Acquisition Project Manager	Frank Renton
HSE Manager	
Exploration Manager	Ian R. Barr
Consortium Members	Exoil
Acquisition Project Manager	Frank Renton
HSE Manager	
Exploration Manager	James Willis

Consortium Members	Tap
Acquisition Project Manager	Frank Renton
HSE Manager	Blaine Ulmer
Project Manager	Denise Long
Acting Exploration Manager	Bob Cassie
CGGVeritas APAC	
President APAC region	Cameron Astill
VP Marine Acquisition	Rollin Delzer
Marine Operations Manager	Christian Brige
Vessel Operations Manager	Serge LAIGRE
Engineering Support	Mark Plummer
HSE Manager	Bob Joyce
Technical Support	Jeff Cleland
Chase Boat Coordinator	N/A
Pacific Titan	
Vessel Masters	Bruce Wallis / Theodore Strockyj
Party Chiefs	Sigurd Osterud / Haydn Brook
Consortium Members Onboard Representative	Drew Murray Bill Lloyd
Swire Pacific (Singapore)	Allan Wank / Martin Sequerah
HSE Manager	Steve Harris

Telephone numbers for CGGVeritas, Consortium Members and other support personnel are provided in the PROJECT HSE PLAN (CPSP) **APPENDIX 9**.

3.2.2 Sub Contractors

The Ship Manager HSEMS interface is defined in the Crew HSE plan.

The Escort Vessel Interface is defined in this Plan as follows (it may be specified as well in a stand-alone appendix document).

The Chase Vessel(s) Master(s) shall be copied with all relevant information pertaining to the survey. His/her nominated deputy shall participate in a forward HSE planning meeting prior to operation commencement and will request (not limited to) the following information from the CGGVeritas Project Manager or Party Chief:

- HSE considerations, including security aspects
- Obstructions, fixed installations, buoy patterns and predicted traffic in area of Operations
- Fishing activity.
- Communications, reporting lines.
- Weather, tidal and current data.
- Specific Hazards
- Specific Work Instructions,
- Specific Training requirements
- Specific Emergency Contingency Considerations

- Instructions for Workboat operations
- Instructions for Bunkering operation
- Instructions for Escort vessel mooring alongside

The Masters of the accompanying chase vessels have the ultimate responsibility for the safety of the vessel and its crew & for compliance to statutory obligations and for the practice of good seamanship. The chase vessels will operate according to the ISM approved Management System for the vessels.

The chase vessels shall perform support vessel duties for the Pacific Titan and scout vessel and Obstacles clearing duties. The specific tasks will be performed in accordance with CGGVeritas operating procedures for the professional execution of these duties. The CGGVeritas requirements are specified through the following documents:

- Guard/Support vessel procedure.
- Safe sailing and emergency procedure.
- Preparation for bunkering and transfers at sea.
- Check list for Ship-to-Ship fuel transfer.
- Crane Handling operations on support/guard vessel.
- Safety procedures for lithium procedure.
- Incident reporting procedure.
- Emergency response plan.
- CGGVeritas & Consortium Members HSE policies

On occasions it might be necessary to adjust the above procedures to meet the requirements of a particular project. Any adjustment must not be inferior in HSE terms to the established procedures.

When appropriate, OGP Guidelines shall apply to the operation of the Chase vessels.

Communication channels between the Chase vessels, Pacific Titan & Shore personnel will be agreed upon during the project Kick Off meeting

3.2.3 Communications

The following routine communications are in place:

Description	From	To	Comment
Scope of work	Consortium Members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap)	CGGV Project Manager Survey Vessel	In writing
Personnel On Board	Party Chief Pacific Titan	Consortium Members Rep	In writing (E Mail)
Daily survey report	Party Chief Pacific Titan	Consortium Members Rep CGGV Project Manager	In writing (E Mail)
Verbal daily report	Party Chief Pacific Titan	CGGV Project Manager / CGGV Duty Officer	When required
Incident reports	Party Chief Pacific Titan	CGGV Project Manager CGGV Duty Officer Consortium Members Rep	In writing within 24 hrs Any incident involving injury or environmental spill will be reported immediately
Verbal daily report	Master	Party Chief	If applicable –when in close proximity to an installation

Marine mammal sightings

Bridge / MMO

Consortium Members

Copy to be retained onboard

Any additional requirements for reports or communications will be detailed here.

3.2.4 Routine HSE Meetings

The following meetings will be established for the operations.

Kick Off Meeting	
Subjects:	Contractual and HSE specifications, policies, reporting hazard notification, Scope of Work.
Interval:	Start of each project
Organised by:	Project Manager or Party Chief.
Members:	Project Manager (if appropriate), Hess Contract Sponsor and Hess Project Manager (if appropriate), Party Chief, Master, sub-contractors, Hess Survey Representative, and relevant marine crew and survey crew.

Hand Over Toolbox Meetings	
Attendees:	Each person on shift with his counterpart of the other shift.
Frequency:	For shift changes at noon and midnight.(seismic crew)
Aims	Analysis of all the information available, tasks, job to be done and transmission to the operators and department heads.
Record:	On Department Daily Note Book (4 on board; 1 per Department): subjects – decisions.

Intervention Toolbox Meetings	
Attendees:	All people involved in operation + Master for small boat operations.
Frequency:	Before mob operation and any uncommon operation (incl. : door recovery – lost gear recovery – streamer transfer)
Aims	Analysis of all the information available, tasks, job to be done, decisions and designation of the intervention chief operator.
Record:	On Department Daily Note Book or specific form (4 on board; 1 per Department): subjects – decisions, or PTW.

On Board Departmental Meeting (DM)	
Attendees:	All department representatives, with formal designation of a chairman.
Frequency:	Week 2 (or crew change + 1) and week 4 (or crew change – 1).
Aims	Analysis of HSE aspects department by department – preparation of M/V SCM.
Record:	On specific form (4 on board; 1 per Department): subjects – decisions.

On Board Safety Committee Meeting (M/V SCM)	
Attendees:	PC / DHs / HSEA/ Master/Ch. Off. /Hess/Medic
Frequency:	Week 2 (or crew change + 1) and week 4 (or crew change –1).
Aims	General review of all HSE issue (outstanding TBM and DM), including Action Points still pending.
Record:	Minutes of the meeting

Head Office HSE Committee Meeting (HSE Committee)

Attendees:	QHSE / Technical / Operations / Ship Manager if necessary.
Frequency:	Once every 2 months.
Aims	<ul style="list-style-type: none"> • Incident report analysis • Topical Subjects • Statistic analysis • Performance monitoring • Audit follow-up • Dispatch of information to the other vessels • HSE decisions and monitoring. • Industry HSE news.
Record:	Minutes of the meeting.

Additional relevant safety information and alerts are distributed in writing as follows

Source of information / alert	Distributed by	Distribution
Consortium Members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap)	CLIENT Survey Project Manager	CGGV Project Manager Party Chief Masters of chase vessels Consortium Representative
CGGVeritas Other CGGVeritas vessels	CGGV HSE Manager	CGGV Project Manager Party Chief Masters of chase vessels Consortium Members Representative

3.2.5 Meeting Structure

The survey vessel holds safety meetings as per 3.2.4 with attendees as indicated, including Consortium Members representatives when feasible and sub-contract personnel.

3.2.6 Standards and legislation

Reference should be made to the individual HSE Management Systems for details on Standards and Legislation.

CGG procedures for the execution of the work are included in a Quality Management System (QMS) and a HSE Management System (HSEMS). The QMS and HSEMS cover all CGG operations.

A full set of documents is available on board the vessel through the Intranet and records are held by the Party Chief and the Master.

Both systems make reference to relevant laws and standards (International, regional, national or local).

In addition the Consortium Members may have defined procedures for certain operations. Where these are to be followed a full set of relevant documents is available onboard the vessel and also held by the Party Chief.

An HSEMS interface Matrix may be used to define which companies procedures are used for specific operations.

3.2.7 Training and Competence assessment

If additional requirements for Training and competence assessment are defined in the contract, they are addressed in this section.
Standards ones are detailed in the Crew HSE Plan.

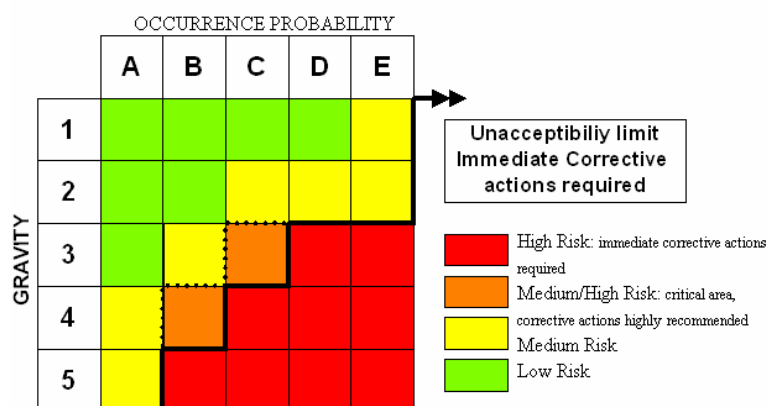
4 EVALUATION AND RISK MANAGEMENT

4.1 RISK Assessments

Hazards and risks are assessed and documented by using the CGGVeritas Risk Management system. However, during operations, any deficiency presenting an unforeseen hazard or risk must be reported as soon as practicable to the Party Chief, who shall inform the relevant parties.

In addition, the onboard hazards database allows for a day-to-day follow up on any survey related or vessel related hazards.

Example of CGGV 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

4.2 Environmental Considerations

CGGVeritas promotes environmental protection in its operations and has established procedures for achieving this. CGGVeritas also observes the principles established in the IAGC Environmental Guidelines for Worldwide Geophysical Operations and the JNCC guidelines.

Reference should also be made to the Consortium Members Environmental Management Plan for relative legislation and reporting requirements.

CGGVeritas Environmental policy statement is included in appendix 1.

5 PLANNING AND PROCEDURES

5.1 HSEMS documentation

The following documentation is available where needed for use:

5.1.1 Crew HSE Plan

The aim of this document is to propose a bridging approach of the two applicable HSEMS on board (CGGVeritas for the seismic part of the activity and the ISM approved MS for the Swire Pacific's organisation). It describes the main requirements and respective responsibilities to the vessel in terms of familiarisation, health, hygiene, human behaviour, personnel transportation, helicopter's operations, vessel's procedures, work and MOB boat, gun deck/back deck operations, seismic navigation, workshops / instrument rooms and crane operations.

5.1.2 Project HSE Plan

The present document provides all information required for complete implementation of the HSE Management System at the scale of a survey.

Any particular requirement (Client, local regulation, particular activities...) about HSE is integrated.

As such, it is also the interface document with the Hess HSE MS. It also includes all the specific organisations for the survey (communication, reporting etc.).

5.1.3 CGGVeritas procedures

The procedures are divided into three categories:

- General procedures, which present the general organisation of the HSE MS
- Specific Procedures, which present the organisation of activities for specific matters.
- Working Instructions that detail a site-specific procedure.

5.1.4 Ship Manager's procedures

These are defined in the ship manager's HSE MS. The interface is detailed in the Interface Manual, which is part of the crew HSE Plan.

5.1.5 Shipboard Individual Safety booklet

This booklet aims to be a general-purpose instrument for people who will have to live and work on board. It is the basic tool given to everybody to create or improve a safety culture onboard a vessel. It presents all the HSE information possibly needed for living on the vessel: the communication means, what to do in emergency situation (man overboard, fire or smoke detected, fire or abandon ship alarm sounded), the muster and embarkation stations, the emergency escape routes etc.

This booklet is a summary of the safety tour(s), each person joining a vessel has been taken throughout the vessel immediately after boarding. It summarizes all the actions to be taken case by case, each situation known as a hazardous one.

During chase vessel operations this document may not be available, all personnel joining the chase vessel are to be briefed on emergency procedures and be given a guided safety tour of the vessel

5.2 Management of change

A management of change procedure has been developed to assure 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 the CGGV working environment.

- Level 1 changes
Changes in the general system that will affect policies, objectives and could create an extension to the system.
- Level 2 changes
Changes that will affect improve or modify an existing procedure or control.
- Level 3 changes
Changes that will lead to modify the HSE practices at the scale of a project (working instructions, emergency response, resources...).

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

Level 1, 2, and 3 changes follow the procedure to assure assessment of risks associated and required authorisation is given.

5.3 Health and Safety emergency planning

Whilst CGGVeritas will provide good quality training, careful supervision and comprehensive planning for this survey, CGGVeritas nevertheless accepts it may be desirable to further anticipate potential incidents and plan clear, appropriate and rapid responses to them. An emergency response plan is therefore prepared in consultation with CLIENT and is issued during the mobilisation for the survey (Refer to attached Medevac procedure).

It includes the following:

- Emergency services: prior to the start up of the survey, a complete analysis of the local conditions permits to establish a “Medevac” procedure
- Coastguard: all rescues to be co-ordinated through a nominated rescue centre, but to be used only in genuine emergencies where no other suitable help is available.
- International emergency radio channel is Marine Channel 16
- Hospital Services
- Contact numbers & radio channels
- Military authorities, if deemed necessary
- Emergency procedures: If deemed necessary, additional procedures shall be created following pre-survey consultation.

5.4 Safety Critical Information

The Consortium Members and CGGVeritas shall evaluate the surface and sub-surface hazards and the engineering activities within an area containing the actual survey area and an additional 10 km boundary to allow for vessel manoeuvring. This is summarised in the Hazard Assessment (Appendix 8 to the Project HSE Plan (CPSP)) and in the Safe Navigation Area (Appendix 12 to the Project HSE Plan (CPSP)).

The Master and Party Chief shall check the operational area for all hazards to navigation to ensure safe operation of the vessel. In addition they shall check their records for hazards

upon receipt of the Scope of Work. The Party Chief is responsible for notifying the Project Manager and the CLIENT Survey Representative of any additional hazards that relate to the work.

The Client shall, when available, copy CGGVeritas of the relevant Environment Assessment for the survey.

5.5 Plant and Equipment control

Hazards and risks associated with plant and equipment will be assessed and documented by CGGVeritas prior to all operations. However, during operations, any deficiency presenting an unforeseen hazard or risk must be reported as soon as practicable to the Master, who shall inform the relevant parties.

CGGVeritas shall ensure that controls are in place to confirm that all equipment used, including third party, is maintained to an appropriate standard and remains fit for purpose.

5.6 Company/Contractor Drills

Emergency drills are carried out according to vessel owner/managers procedure. Shipboard Oil Pollution Emergency Plans and drills will be carried out in line with MARPOL Regulations.

5.7 Permitted Operations

The generic Manual of Permitted Operations is presented in the HSEMS Manual. When necessary, vessel specific MOPO is detailed in the Crew HSE Plan. Any CLIENT, survey or locally specific instructions affecting the MOPO will be detailed in this section.

In situations where no specific MOPO is available working conditions shall be assessed on site by the Master and Chase Vessel Masters. If weather conditions are deemed unsuitable for the tasks in hand then operations shall cease until such time as it is deemed safe by the relevant Masters to continue.

6 IMPLEMENTATION AND MONITORING

6.1 Performance Indicators

CGGVeritas monitors a number of key HSE performance indicators. At the beginning of each month, the indicators defined in policy and objectives are provided by the vessel management. They are reviewed every 2 months by the Office HSE Committee. They are displayed to all departments and vessels, presented as graphics and per vessel to allow comparison. Actions are defined or not according to the results.

Survey specific performance indicators or scorecards should be detailed in this section.

6.2 Incident Reporting

Accident / Incident Reporting on the vessels shall be carried out in accordance with the Ship Manager and CGGV HSE Incident Reporting Procedure.

In addition, the CLIENT reporting system shall be operated if required.

The Captains will forward copies of Incident Reports to each other. The Party Chief is responsible for forwarding copies of any incident report to the CLIENT Onboard Representative (when applicable) and the Consortium Members onshore primary contact (Frank Renton). The CLIENT Onboard Representative shall ensure the CLIENT reports form, if any, is completed and submitted where required. Any serious or injurious incidents shall be reported to the onboard Client representative immediately. All other incidents will be reported within 24 hrs.

The following incidents are to be reported immediately

1. Any incidents requiring Medevac or shore side treatment
2. Any incidents that may have an environmental impact
3. Any incidents of a politically sensitive nature (environmental & political activists)
4. Any incident resulting in death or permanent injury

In the event of the above the following designated people are to be informed

Onboard Client representative (Drew Murray and Bill Lloyd)

Vessel Operations manager (Serge Laigre)

Consortium Members primary contact (Frank Renton)

Contact details for the above are contained in **appendix 9** of the HSE plan (CPSP) and in the accompanying Medevac notification procedure. In the event the designated person is not contactable alternative contacts are listed in the Medevac notification procedure.

Australian legislation requires the following additional reporting requirements in addition to the standard CGGVeritas system:

**In the event of an incident the Master of Pacific Titan is required to notify AMSA.
“Consortium Members” will inform NOPSA**

Relevant contact details are contained in appendix 5 of this document

It is important that when contacting the regulatory authority (or any other body as required) that only the facts are provided. If information is not known or is unavailable then the caller

must advise the authority of this and inform them that they will return the call when the information is known.

The following bodies are to be informed if such incidents occur:

AUSTRALIAN MARINE SAFETY AUTHORITY

Australian Marine Safety Authority (AMSA) shall be notified as soon as practical if any of the incidents set out below occur:

- Vessel has sustained or caused an accident occasioning loss of life or serious injury;
- Where a vessel has received damage or is defective affecting its seaworthiness; or
- There is serious danger to navigation. For example, if sizeable equipment which was likely to float was lost during a storm.

AMSA provides maritime and aviation search and rescue services, marine environment protection services, navigational services covering navigational aids and ship operations, ship and personnel safety services including marine survey, marine qualification, crewing of ships and international relations; and Australia's international marine relations.

Reporting incidents to AMSA is required under the Navigation Act 1912, and applicable Marine Orders; in particular, section 268 and 269.

NATIONAL OFFSHORE PETROLEUM SAFETY AUTHORITY

Regulation 46 of the Commonwealth Petroleum (Submerged Lands) (Management of Safety on Offshore Facilities) Regulations 1996, and the Petroleum (Submerged Lands) Act Clause 41 of Schedule 7 – Specific Requirements as to Offshore Petroleum Exploration and Production 1995 requires initial notification (oral or written) to NOPSA as soon as practical (without comprising the incident response), and a written report within 3 days for any of the following incidents:

- Fatality or serious injury; or
- Significant damage to a vessel; or
- Serious near miss with potential to cause fatality or serious injury or significant damage.

The "Consortium Members" Project Manager is responsible for contacting and notifying NOPSA of any incident (under PSLA Schedule 7 the reporting of incidents to NOPSA is the responsibility of the nominated operator of the vessel.

409 Notification set out ensures compliance to regulation 46 of the commonwealth Petroleum (submerged Lands) (Management of Safety on Offshore Facilities) Regulations 1996, and the Petroleum (Submerged Lands) Act Clause 41 of Schedule 7 - Specific Requirements as to Offshore Petroleum Exploration and Production 1995.
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The following table lists the NOPSA reporting requirements

Notification Trigger	Timing	Details Required
<p>Any incident that causes or has the potential to cause death, serious injury, damage to safety critical equipment or incidence of public concern:</p> <p>For example:</p> <ul style="list-style-type: none"> •Medivac from injury in connection with the facility •Explosion or fire •Collision involving marine vessels •Uncontrolled hydrocarbon vapour releases exceeding 1 kg •Uncontrolled escape of petroleum liquids exceeding 80 litres •Well kicks exceeding 50 bbls •An unplanned event that required the Emergency Response Plan to be implemented <p>If in doubt notify</p>	<p>As soon as practicable</p> <p>1: Verbal or written notification to an Inspector as soon as practicable after the incident, or its detection.</p> <p>Notification to generally include items 1 to 15 of next column, where available and applicable</p> <p>Written Report within 3 days</p> <p>2: Written report to the NOPSA of items 1 to 19 inclusive as soon as practicable but within 3 days of the accident or incident occurrence, or its detection (unless otherwise agreed with the NOPSA).</p> <p>Items 20-21</p> <p>3: NOPSA / DA will, in each situation that a report has to be provided, consult with the facility operator to agree in writing on an acceptable timeframe.</p> <p>Monthly Reporting</p> <p>4: The operator shall also provide a summary of deaths and injuries, other than minor injuries not requiring treatment or first aid cases, in a form acceptable to NOPSA not later than 15 days after the end of each month.</p>	<p>General</p> <ol style="list-style-type: none"> 1. The facility/pipeline name, site name or location where the incident occurred. 2. Name and business address of employer who controls work site. 3. Time and date of incident. 4. Names and contact details of any witnesses. 5. Name/position/telephone number of person submitting these details. 6. Brief description of incident. 7. Work/activity being undertaken at time of incident. 8. Action taken to make work-site safe or prevent environmental damage including details of any disturbances of the work site. 9. Was emergency response initiated? <p>Injuries</p> <ol style="list-style-type: none"> 10. Name of employer of deceased/injured person(s) [if any and if different from answer in item 2]. 11. Details of deceased/injured person(s) – including: name, date of birth, sex, residential address and telephone number, occupation/job title and details of injury, details of job being undertaken. 12. Day of shift and hour of shift (e.g. 5th day of 7, 1st hour of 12). <p>Fluid Escape</p> <ol style="list-style-type: none"> 13. Estimated quantity and composition of fluids that escaped or burned including known toxicity. 14. Duration of escape 15. Location and weather conditions. <p>Serious Damage</p> <ol style="list-style-type: none"> 16. Identify equipment damaged and to what extent. 17. Will the plant be shut down and for how long. <p>Immediate Actions</p> <ol style="list-style-type: none"> 18. Immediate action taken/intended, if any, to prevent recurrence of incident. <p>Analysis and Remedial Actions</p> <ol style="list-style-type: none"> 19. Immediate cause analysis. 20. Root cause analysis and full report. 21. Actions to prevent recurrence of incident with responsible party and completion date.

Victoria Police

The Victorian Police (1) shall be notified as soon as practical if any of the incidents set out below occur any fatality

- Aircraft or vessel in distress
- Emergencies or any unauthorised acts
- Other criminal activity.

The Victorian Police may take over control of an emergency response (in the case of aviation or marine incident AusSAR will take over command). The Police will liaise with the AusSAR Coordinator. The "Consortium Members" Leader shall continue to co ordinate Pacific Titans actions as requested by the Police and provide expert advice to them via the members.

The Federal Police have jurisdiction outside the 3 mile state water limit although the Victorian police are responsible for coordinating all emergency services to respond to emergencies.

(1) The Victorian Police resources include the Police Air Wing and the Police Task Force, which are specialist services for search and rescue. The Police can request military assistance from forces stationed in the region.

VICTORIAN DEPARTMENT OF PRIMARY INDUSTRIES

The Victorian Department of Primary Industries (DPI) shall be notified (2) as soon as practical of all offshore emergencies or incidents]. Discretion is allowed for delaying the reporting smaller environmental incidents to the Victorian DPI if the incident occurs outside of office hours. (2) – The Victorian DPI is the administering authority for the Petroleum (Submerged Lands) Act in Victoria.

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Tasmania Police

The Western District provides policing services to the communities of the north-west and west coasts of Tasmania, including King Island. The District has three geographical divisions: Burnie, Devonport and Queenstown, and the following support services.

- Emergency response, rescue services and support (including flood and storm response, road crash rescue, search and rescue and general rescue)
- Emergencies or any unauthorised acts
- Other criminal activity.

6.3 Incident Follow Up – Corrective Actions

The aim of the Action Point System is to demonstrate how we manage all the information to improve HSE at a level for a specific installation; and to implement all necessary corrective actions to all identified deficiencies.

Every installation (vessel, onshore station.) and the head office are provided with Remedial Action Plan (RAP). The vessel's Action Plans are printed out and displayed monthly after being reviewed by the Vessel Operation Manager.

A specific code is used to differentiate the origins of the findings, which lead to the concerned Action Point:

- In HSE reports from on board meetings,
- In HSE reports from offices meetings,
- In audit reports from external or internal companies/auditors.

The RAP is updated with all actions points by the vessel (Master and Party Chief) under control of the Vessel Operation Manager.

All actions required are integrated in the Action Point system and the Vessel Operations Manager then dispatches the listing to the concerned Department Managers for assignation of the person in charge of a particular action when this is required.

Any Defects or Remedial Actions concerning the Chase vessels are to be reported to the Party Chief immediately

7 AUDITING AND REVIEW

7.1 Definitions

Audit:	<i>Independent examination of the HSE system (in its whole or by part) to assess how it has been used over a period, and so 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 Check-List.</i>
Unsafe act audit:	<i>Conducted by managers visiting the vessel and on board managers, they complete reports. Serious Unsafe Acts are reported on the Incident forms and treated as other incidents. Safety Observation Card system allows all employees on board to report unsafe acts and unsafe situations.</i>
M.S.V:	<i>Manager Safety Visit.</i>
C.S.V	<i>Crew Safety Visit.</i>

7.2 Audit Plan

Audit team	Objectives
External Auditor	HSE audit of the whole operations: Each vessel once a year
Department Managers (Ops. Equip. HSE)	HSE inspection: Each time boarding.
Vessel Operation Managers	HSE inspection: Each time boarding.
Technical Managers	HSE inspection: Each time boarding.
CBC and/or on board HSE Advisor if any	HSE inspection: 1 / week
Department Heads	HSE Cross inspection of the work places: 1 / month

7.3 Reviewing

7.3.1 Review of performance and effectiveness of the HSEMS

Actions raised from audits, inspections, meetings or incidents are analyzed and reviewed during the onboard Safety Committee Meeting.

An overall review of performance is achieved at the end of the survey through the End of Survey Questionnaire. End of Survey HSE review will also be jointly conducted between CGGVeritas and Client during the Post Survey meeting.

7.3.2 Incident statistics


One of the tools of performance reviewing is the statistics monitoring. CGGVeritas fully adheres (since the start) to the Step Change in Safety Initiative for the marine seismic industry, which amongst other actions sets up and follows definitions of terms, rates, statistical analysis...

Our statistics are available on request.

REFERENCES

- CGGVeritas Management System
- SHIP MANAGER ISM approved Management System
- OMS Management System
- Contract between CGG Services and the Consortium Members (Santos, 3D Oil, Bass Straits Oil Company, Cue Energy Resources, Eagle Bay Resources, Exoil and Tap)
- Hess Management System

APPENDIX 1: CGGV HSE OBJECTIVES 2007




HSE OBJECTIVES 2007

2007 PRIORITIES & TARGETS

- **CONTINUOUS IMPROVEMENT**

No fatal accident - No permanent total or partial disabilities	
• Lost Time Injury frequency (LTIF)	< 0.25
• Lost Time Injury & Restricted Work Case frequency (LTI+RWC)F	< 0.5
• Total Recordable Case frequency (TRCF)	< 1.5
• Specific targets are defined for the most hazardous activities :	
➢ Workshops and Maintenance (LTI+RWC+MTC) F	< 0.7
➢ Lifting and Handling (LTI+RWC+MTC) F	< 0.5
• Health: Lost Time Medical Case Frequency	< 1
• Environnement: Environmental Disturbances Frequency (ENDF)	< 1
- **ENVIRONMENT**
 - **Environmental Risk Management**
 - ➔ Further develop the **Environmental Risk Assessment** focusing on Aspects and Impacts Assessments and Performance Monitoring for all surveys in sensitive environment areas.
 - ➔ Review the Waste Management standards and implement consistently on all vessels.
- **HEALTH**
 - ➔ Deploy the **Vector Control Program** (Malaria, dengue, chikungunya ...) in relevant areas.
- **HUMAN BEHAVIOUR**
 - ➔ Reinforce participation in QHSE Programs through the development and implementation of individual **QHSE Incentive program** including subcontractors.
- **HSE MANAGEMENT SYSTEM**
 - **Risk management**
 - ➔ Improve control of critical Ship Manager operations through deployment of the **Risk Management program**. Achieve 100 % closure of actions within the year.
 - **Implementation and Monitoring**
 - ➔ **High Risk** actions from audits and High Potential Incidents shall be monitored and followed up in Management Reviews.
 - **Auditing**
 - ➔ Perform **2 internal Audits** per vessel within the year.
 - **Training**
 - ➔ 100% of **Department Heads** trained to **HSEMS** within the year (2 days sessions).



C. Richard Price
Executive VP
Marine Acquisition Product Line

All targets and objectives include the performance of our subcontractors.
All figures are on a basis of 24H per day and 1 million hours.
Distribution: all departments, agencies, offices and vessels for general display

January 2007

APPENDIX 2: CGGV CORPORATE HSE POLICY

Date for Review: December 31st 2007

QHSE POLICY

CGGVeritas is committed to achieving and maintaining excellence in all aspects of its activities. CGGVeritas recognizes and accepts the mandate to conduct its activities in a responsible manner. CGGVeritas will, so far as it is reasonably practicable, provide a system of work that in order to protect the health, safety and security of our employees, visitors, contractors and the public and at the same time minimizes the impact of its activities on the environment. CGGVeritas recognizes that all injuries are preventable.

To achieve excellence in our business and work environment, the commitment and cooperation of all management, staff, contractors and visitors is essential. Line management is accountable for achieving these objectives.

In order to support this policy CGGVeritas will:

- Develop, implement and maintain an Integrity Management System (IMS) having integral components of Quality, Performance, Health, Safety, Environment and Security supported by Integrity;
- Comply with local, international regulations and industry standards;
- Promote and maintain awareness of workplace hazards, the risks associated with them and the techniques to render risks as low as reasonably practicable;
- Ensure that employees are competent to conduct their specified tasks;
- Set objectives, regularly review performance, specify Key Performance Indicators and recognize excellence;
- Maintain a reporting system that allows analysis of incidents, potential incidents and non-conformities which disseminates recommendations to prevent recurrence across the Company;
- Conduct regular audits and inspections of company, and where applicable, contractor facilities;
- Demonstrate continuous improvement.

CGGVeritas will allocate sufficient resources to achieve these objectives, and all employees and contractors will be required to:

- Comply with or exceed relevant standards specified by statute, industry or the Integrity Management System (IMS);
- Accept responsibility for protecting themselves, fellow employees, visitors and members of the public who may be affected by their activities;
- Contribute to the planning process, actively participate in assisting the company in achieving its objectives;
- Actively participate in the reporting and subsequent investigation of all accidents, incidents, hazards and near misses that have the potential to impact on CGGVeritas operations;
- Proactively propose opportunities for improvement and communicate as appropriate;

Paris, January 2007


Robert BRUNCK
Chairman and CEO

APPENDIX 3: CGGV 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

Distribution : All departments, agencies, offices and crews (for general display).

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QHSE Department

APPENDIX 4: CGGV SECURITY POLICY



SECURITY POLICY

The CGG Group provides a secured working environment by protecting its employees, its subcontractors, its assets and its operations against the risk of injury, loss or damage from criminal, hostile and malicious acts.


The CGG Group is therefore committed to improving continuously its security performance by:

- Developing a security risk assessment and management process to ensure security risks are well identified at planning and implementation stages,
- Assuring that emergency response plans for security incidents are clearly defined, maintained and drilled,
- Assessing the security measures in place through specific audits and regular reviews at all levels of the organisation.

In this respect, the CGG Group undertakes to:

- Integrate security in its HSEMS, and design it as a cornerstone of any project;
- Assure that its sub- and co-contractors' management systems fully support the same commitment;
- Engage open dialogues and consultations with local communities to ensure that potential issues arising from seismic operations are identified and associated risks addressed in due time;
- Operate and regularly maintain security equipment so that it is up to date and fit for purpose;
- Review regularly security plans;
- Report, investigate and analyze security incidents to prevent recurrence and improve efficiency;
- Examine regularly recorded and investigated security management performance with the aim of ensuring a continuous and sustainable improvement in the management of security.

Massy, April 2004


Robert BRUNCK
Chairman and C.E.O.

Distribution: All departments, agencies, offices and crews (for general display).

Corporate QHSE Department

APPENDIX 5: CGGV D & A 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.

Massy, January, 2000

Robert BRUNCK
Chairman and Chief Executive Officer

Distribution : All departments, agencies, offices and crews (for general display).

8802101

Département QHSE

APPENDIX 6: CONSORTIUM MEMBERS HSE POLICIES

Environmental Policy



Our Environmental Vision:

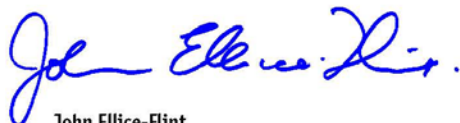
“We will lighten the footprint of our activities”

At Santos we are adopting the principles of sustainable development. We recognise our responsibility to meet community expectations and we are committed to the continuous improvement of our environmental performance. We believe that environmental stewardship is both a management obligation and the responsibility of every employee.

To achieve this we will:

- Maintain and continuously improve the Environment, Health and Safety Management System (EHSMS) across the organisation.
- Ensure that all employees and contractors receive appropriate training to fulfil their individual EHSMS and environmental responsibilities.
- Proactively pursue the identification of all hazards and eliminate or, if not possible, manage the risk to as low as reasonably practicable.
- Establish annual environmental objectives and targets and implement programs to achieve them.
- As a minimum comply with relevant legal and other requirements.
- Ensure that we have the resources and skills necessary to achieve our environmental commitments.
- Incorporate environmental performance in the annual appraisal of employees and contractors and recognise accordingly.
- Implement strategies to minimise pollution, manage waste effectively, use water and energy efficiently and address relevant cultural heritage and biodiversity issues.
- Formally monitor, audit, review and report annually on our environmental performance and EHSMS requirements against defined objectives.
- Require that companies providing contract services to Santos manage their environmental performance in line with this Policy.
- Steward the environmental performance of Joint Venture activities operated by others.

As the Managing Director, I am committed to working with Santos personnel to ensure that this policy is communicated, understood, accepted and successfully implemented by all Santos employees and contractors.



John Ellice-Flint
Managing Director

Revision 2

Santos Ltd - ABN 80 007 550 923

File No: POLICY-P040

Health & Safety Policy



Our Health and Safety Vision:

"We all go home from work without injury or illness"

We believe that:

- No business objective will take priority over health and safety.
- All injuries are preventable.
- No task is so important or urgent that it cannot be done safely.
- Without diminishing management's obligations, the responsibility and accountability for health and safety rests with every individual.

At Santos we are committed to conducting our business in a manner that prevents injury or illness to employees, contractors, customers and the public who may be affected by our work activities. We encourage best practice in health and safety management within this wider Santos community.

To achieve this we will:

- Maintain and continuously improve the Environment, Health and Safety Management System (EHSMS) across the organisation.
- Proactively pursue the identification of all hazards and eliminate or, if not possible, manage the risk to as low as reasonably practicable.
- Consult with and promote active participation of employees in the management of their own and others' health, wellbeing and safety.
- Require that companies providing contract services to Santos manage their health and safety in line with this Policy.
- Provide resources to achieve a systematic approach to health and safety management to ensure continuous performance improvement.
- Identify performance measures, set improvement targets, measure and report performance at all levels.
- As a minimum comply with relevant legal and other requirements.
- Develop a culture where all employees and contractors are constantly aware of hazards around them and act accordingly at and away from work.
- Include health and safety performance in the appraisal of employees and contractors and recognise accordingly.
- Steward the safety performance of Joint Venture activities operated by others.



John Ellice-Flint
Managing Director

Revision 2

APPENDIX 7: EMERGENCY RESPONSE

A - Medevac

Please refer to Separate Document “Pacific Titan Medevac Plan Seboa-Group Shoot V1.1”

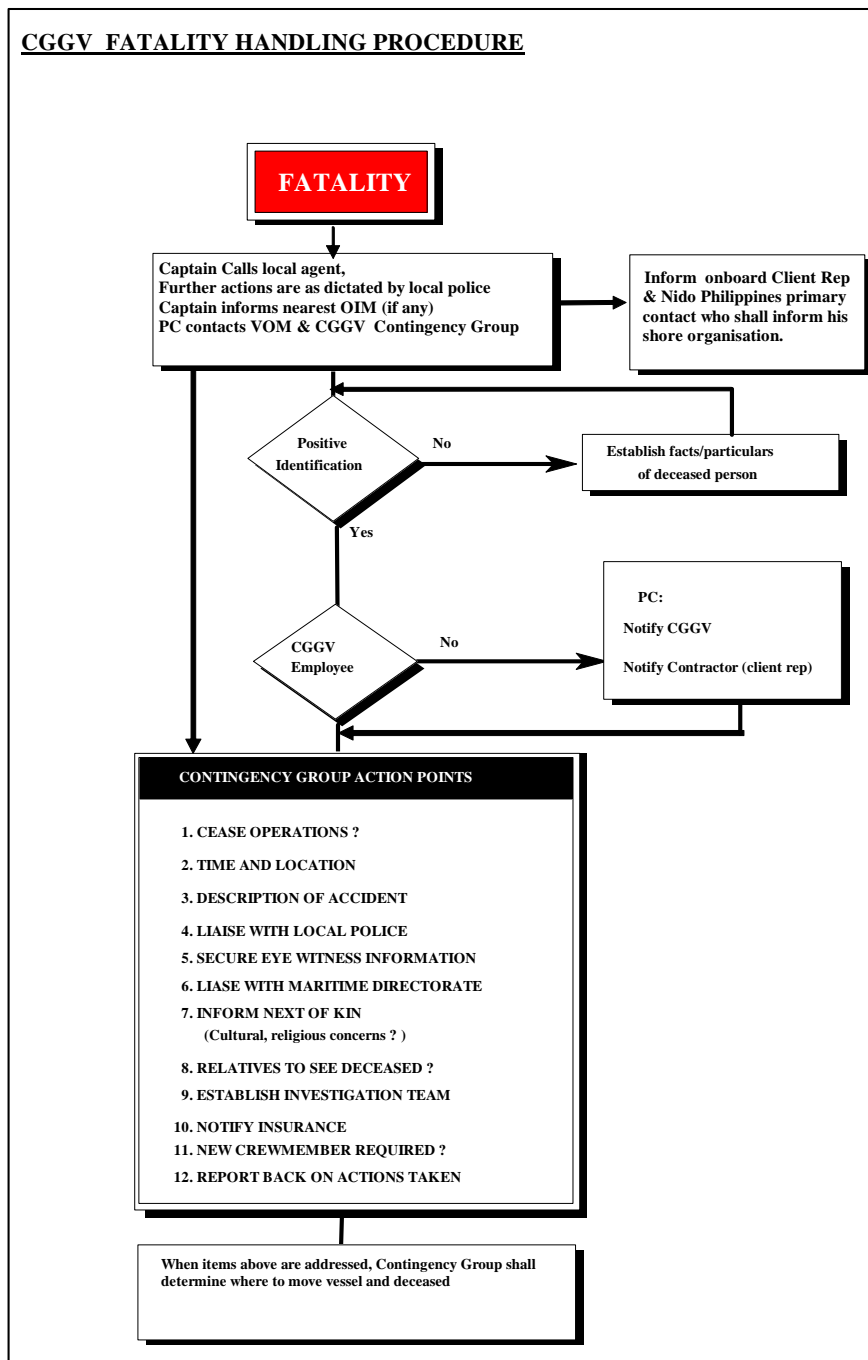
CGGVeritas will provide a Doctor and fully geared clinic onboard the “M/V Pacific Titan”, sufficient for medium-term trauma stabilization. During main seismic operations, the plan is to have the “M/V Pacific Titan” steam close to Portland or Burnie or Lakes Entrance or Melbourne or Eden. At the closest possible location, the FRC will be launched from the Davit and the casualty transported to the ambulance waiting at the pier using the FRC.

B - Emergencies

- Please refer to Separate Document (Medevac) “Bridging Document for 2007 Southern Margins 2D MSS with CGGV Rev2” issued by Santos.
- Please refer to Separate Document (Medevac) “xxx” issued by Tap Oil.
- Please refer to Separate Document (Medevac) “xxx” issued by Cue Energy Resources – Limited.
- Please refer to Separate Document (Medevac) “xxx” issued by Exoil.
- Please refer to Separate Document (Medevac) “xxx” issued by 3D Oil.
- Please refer to Separate Document (Medevac) “xxx” issued by Bass Strait.
- Please refer to Separate Document (Medevac) “xxx” issued by Eagle Bay.

C - Fatalities. Refer to flow diagram below

CGGV FATALITY HANDLING PROCEDURE



APPENDIX 8: PROJECT HAZARD ASSESSMENT

Hazards associated with operations onboard the M/V Pacific Titan have been addressed. They are referenced in the Vessel Hazard register.

External hazard relative to the execution of this survey have been addressed and are referenced in this section. There are no known subsea structures within the areas of the proposed surveys

Generic Hazards

The main vessel areas where Hazards and Activities are likely to lead to highest Risks are:

- Back Deck (moving equipment, man-over-board, noise etc.)
- Engine Room (explosion, hot/burning liquids & surfaces, fumes, noise etc)
- Small boat work (changing out spares, personnel transfer, etc)

The following are the major generic Hazards/Activities that could typically be valid for any seismic survey (extracted from the Hazard Catalogue):

Vessel Area	Activity Description
Engines	Machinery overhaul
Generators	Overhaul of generators, switching between generators
Strong wind and rough sea	Scouting & recovery operations in rough seas Walking/Entering ladders and stairs in rough seas
General maintenance	Working with cutting (knives or other tools) / rotating tools
Lifting & handling	Lifting heavy loads
Wire ropes	Towing, winching, crane operations
Winches	Recovering, winching, deploying
MOB & Work boats	Launching/recovering of boats
MOB & Work boats	Transfer of personnel & equipment
Third party vessels	Use of chartered vessels, chase, supply and crew boats General ships traffic

Generic Hazard Catalogue

Hazard Group	Activity/Hazard	Risk	Control measures
PERSONAL SAFETY – HEALTH AND HYGIENE	Stress, fatigue, shift work, overwork and lack of fitness.	Personal injury or death, loss of equipment or vessel	Sufficient crew for safe operation (24 hours) Fitness Mandatory Medical
PERSONAL SAFETY – HEALTH AND HYGIENE	Self-medication	Aggravation of complaint, death	CGGV D & A policy
PERSONAL SAFETY – HEALTH AND HYGIENE	1. Food poisoning 2. Cleanliness and Hygiene 3. Water contamination 4. Pests	Individual or all personnel incapacitated – death	Vessel hygiene procedure (ISM Code)
PERSONAL SAFETY - HEALTH AND HYGIENE	Infectious and chronic diseases	Individual or all personnel incapacitated – death	Vessel hygiene procedure (ISM Code) Bottled drinking water
PERSONAL SAFETY – HEALTH AND HYGIENE	1. Air pollution 2. Smoking 3. CO – Carbon monoxide 4. Vapours from solvents and cable oil.	Asphyxiation – death, lung cancer, bronchitis, heart disease.	Vessel smoking routines (No smoking areas) Permit to work system CGGVHSE guidelines
PERSONAL SAFETY – HEALTH AND HYGIENE	Sexually transmitted diseases and AIDS	Genital infections – death	Mandatory Medical check. CGGV country Guidelines
PERSONAL SAFETY – PROTECTIVE CLOTHING	Unsuitable and unavailable 1. Eye protection. 2. Coveralls. 3. Shoes/boots. 4. Helmets. 5. Ear protection. 6. Safety harnesses. 7. Gloves. 8. Life vests.	Personal injury, fatality	Toolbox meeting Worksite introduction Observation cards X-department inspection GSR training modules
PERSONAL SAFETY – PROTECTIVE CLOTHING	Exposure to sunlight, UV radiation	Skin Cancers, cataracts, eye damage	Sun brims on hard hats, sun block cream, UV protective safety glasses, UV protective grade long sleeved overalls.
PERSONAL SAFETY AND HYGIENE	Noise levels.	Loss of hearing, pain, tenuous	PPE to be used in high level noise areas.
TRANSPORTATION - AIRLINES	Domestic air carrier hazards	Multiple fatality	Rely on external audits and approval of airlines.

Hazard Group	Activity/Hazard	Risk	Control measures
PERSONAL SAFETY - LIFTING	Lifting and handling heavy loads	Back injuries, damaged hands or feet and other injuries. Damage to equipment.	On the job training concerning correct lifting & handling. Observation cards. CGGV Training modules
PERSONAL SAFETY – ALCOHOL AND DRUGS	Alcohol and drugs	Personal injury and death, damage to equipment/vessel.	Drug & alcohol policy
TRANSPORTATION – SMALL BOATS	Use of local vessels	Multiple fatality, loss of vessel	No personal transportation using small boats unless certified & audited. CGGV workboat procedures
TRANSPORTATION – SMALL BOATS	Using small MOB and or work boats for: 1. Working on deployed equipment. 2. Personnel or equipment transfer to another vessel Associated hazards: 3. Engine failure, 4. Launch and recovery operations. 5. Fire on boat, 6. Worsening weather.	Multiple fatality by drowning, falling, struck by object, loss of equip., kerosene spill	MOB boat procedure. No planned work boat activities No personnel transfer during darkness. MOPO. Certified Coxswains
VESSEL OPERATIONS – GENERAL	Movement About Vessel	Personal injury/fatality/damage to equipment and vessel	All people instructed to not run. Marking of obstacles. Vessel introduction. Advice on stepping, etc. Training
VESSEL OPERATIONS – GENERAL	Oxygen deficiency due to presence of toxic gases (CO2/Halon) or flammable gases	Damage/loss of equipment/vessel	Emergency response procedure. Permit to work in enclosed spaces.
VESSEL OPERATIONS – GENERAL	Security during Port Calls 3rd Party Safety	Loss of property. Injuries. Fatalities.	Port call plan ISPS regulations CGGV Security Policy
VESSEL OPERATIONS – PROPULSION, STEERING FAILURE	FAILURE OF EQUIPMENT 1. Steering Failure 2. Engine Failure 3. Power Failure	Personal injury/death Damage/loss of vessel Collision with fixed structure	Vessel procedure Control/certification of equipment. ISM Code Towing equipment made ready Emergency procedures. Lead chase boat with towing capability

Hazard Group	Activity/Hazard	Risk	Control measures
VESSEL OPERATIONS – RADIO, RADAR AND NAVIGATION	Collision with 1. Other seismic craft during dual seismic operations 2. Oil rig during seismic operations 3. Other vessels and objects	Personal injury/death. Damage/loss of own/other vessel/equipment.	Vessel Close pass procedure Qualified watch keepers
VESSEL OPERATIONS – GALLEY	1. Hot fat, hot liquids, steam, hot ovens, ranges and pots 2. Poorly stacked/stored materials	Burns, scalds, personal injury/death.	Safe equipment .Vessel procedures .Worksite introduction X- department inspection No unauthorised persons allowed in Galley
VESSEL OPERATIONS – ENGINE ROOM	Fuel oil and Lub oil leak	Personal injury/death Loss/damage to equipment/vessel Pollution	Vessel SOPEP plan
VESSEL OPERATIONS – CRANES AND ASSOCIATED LIFTING EQUIPMENT	Unsafe use of cranes and associated lifting equipment.	Personal injury/death Damage to equipment/vessel	Certification of all lifting equipment. Operator approved by captain. Training .Pre Job RA
VESSEL OPERATIONS – PORTABLE LADDERS, SCAFFOLD AND STAGES.	Unsafe use of ladders, scaffold and staging.	Personal injury/death Damage/loss of equipment	Work introduction Toolbox meeting PTW for working at heights
VESSEL OPERATIONS – HAZARDOUS MATERIALS	Hazardous substances (including paints, chemicals and acids).	Personal injury and death, damage to equipment and vessel	Vessel procedure for handling of hazardous substances Protection against hazardous substances part of all relevant procedures COSHH data sheets
VESSEL OPERATIONS – MAINTENANCE	Misuse and abuse of hand tools and portable electric, pneumatic and hydraulic tools. Risks to personnel in workshops.	Injury to personnel, fatality, damage to equipment	Tools, Equipment and Machinery Training. Appropriate PPE & PTW
VESSEL OPERATIONS – MAINTENANCE	Welding, Cutting and Burning	Destruction of part/all vessel. Personal injury and death. Continual when hot work carried out.	Tools, Equipment and Machinery. Permit to Work & PPE Personnel to be qualified & supervised. Fire sentry
VESSEL OPERATIONS – MAINTENANCE	Machinery overhaul	Personal injury, death	Vessel procedure Qualified personnel
SEISMIC OPERATIONS – AIRGUNS AND COMPRESSORS	Sudden release of high air pressure from air guns, compressors, tanks, pipes, hose lines, valves and fittings	Serious injury, fatality if untreated	Certification and Maintenance of High Pressure Air system Technicians & operators to be qualified

Hazard Group	Activity/Hazard	Risk	Control measures
SEISMIC OPERATIONS – AIRGUNS AND COMPRESSORS	Explosion due to combustible fluids in high pressure system or high temperatures caused by compression ignition	Serious injury due to high pressure air release, possibly leading to a fatality	Vessel procedure ISM Correct PPE Barrier for high risk areas
SEISMIC OPERATIONS – AIR GUN HANDLING	Deployment and Recovery: 1. Gun floats suspended from two wires, 2. Damaged wire ropes, 3. Working on pressurised single strings during maintenance, 4. Unguarded umbilical, 5. Noise, 6. Deploying guns, 7. Guns swinging onboard	Injury to head, ears, body and feet, bruising, crush injuries, drowning, damage to equipment.	Appropriate PPE Worksite introduction Procedures: Deployment & recovery of gun string SJA Toolbox meetings
SEISMIC OPERATIONS – STREAMER HANDLING	Deployment and Recovery of back deck equipment by crane or winches (tail buoys and paravanes, etc.)	Lacerations and bruises, crush injuries, drowning, hypothermia, damage to equipment	Appropriate PPE Worksite introduction Procedures: Deployment & recovery of tail buoys Toolbox, meetings & Training
SEISMIC OPERATIONS – STREAMER HANDLING	Deployment and Recovery – 1. Unguarded Streamer Reels, 2. Attaching and detaching 'birds', 3. Streamers moving on deck when turning, iv) rapid recovery of streamers during testing, 4. High voltage on streamers, 5. Waves sweeping up back deck	Bruising, head injuries, broken limbs, internal injuries, hypothermia and drowning	Appropriate PPE. Worksite introduction Procedures: Deployment & recovery of streamers SJA Toolbox meetings
SEISMIC OPERATIONS – OILS	Kerosene: 1. General Hazards, 2. Filling streamer sections	Nausea/headache s/burns, fire leading to partial /total destruction of ship	MSDS Datasheet Product information – Isopar M Protection against hazardous substances part of all relevant procedures.
SEISMIC OPERATIONS – HAZARDOUS MATERIALS	1. Battery charging, 2. Lithium batteries, 3. Sundry chemicals	i) Acid burns/injuries to eyes, ii) fire/explosion, iii) explosions and fires	Handling and storage of Lithium Batteries COSHH. PPE
SEISMIC OPERATIONS – WORKING ON DEPLOYED EQUIPMENT	Working on deployed equipment: 1. Streamers, 2. Tail buoys	Injury to person, multiple hypothermia and drowning, loss of workboat	No in-sea maintenance. Toolbox meetings Appropriate PPE SJA
SEISMIC OPERATIONS – INSTRUMENT ROOM	Multiple electrical equipment Smoking Soldering Working Area	Personal injury, damage to equipment, fire damage, loss of ship	No Smoking Area Permanent installations Separate electrical workshop. Correct installation Certified equipment

Hazard Group	Activity/Hazard	Risk	Control measures
EMERGENCY PROCEDURES – LIFE SAVING AND PROTECTIVE CLOTHING	Lack of Flotation Devices	Death by hypothermia, drowning	Periodic control of lifesaving equipment SOLAS Life vest included in maintenance system AMOS
EMERGENCY PROCEDURES – SURVIVAL AT SEA	Abandonment	Multiple death by drowning, hypothermia and injuries	Vessel emergency procedure and drills. SOLAS Training, BOSS
EMERGENCY PROCEDURES – MAN OVERBOARD PROCEDURES	'Man overboard'	Hypothermia/death by drowning/possible further loss on launching MOB boat	Vessel emergency procedure and drills BOSS
EMERGENCY PROCEDURES – MARINE FIRE PROTECTION AND PROCEDURES	Fire outbreak anytime	Personal injury, death, Lack of response leading to death and loss of ship	Vessel emergency procedure and drills BOSS Vessel inductions
VESSEL OPERATIONS – MARINE FIRE PROTECTION AND PROCEDURES	Fire hazards – General	Personal injury/death Loss/damage to vessel/equipment	Fire detectors. Vessel emergency procedure and drills Vessel inductions

The project specific Risk assessment is presented on the following pages

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
Back Deck critical activities								
1	Deployment and recovery of Gun Arrays	<ul style="list-style-type: none">• Not following procedures• Weather conditions• Equipment failure• Poor attitude to safety• Unexpected vessel movements	<ul style="list-style-type: none">• injury to personnel• Damaged Equipment• Man overboard	C	4	<ul style="list-style-type: none">• WZ-SBO-GP-001(Deployment and recovery of Gun Arrays).• JSA• Maintenance• Certification• MOPO• Toolbox meetings• Communications	B	3
2	High pressure air	<ul style="list-style-type: none">• Failure of Gun Cable• Failure of PMS• Failure of Manifold• Failure to Follow Procedures	<ul style="list-style-type: none">• injury to personnel• Damaged Equipment	C	3	<ul style="list-style-type: none">WZ-SBO-GP-002 High pressure Air Procedure• PMS• Certified Components• Testing• Auditing• Inspections• Signage	B	3
3	Handling Gun arrays on Deck	<ul style="list-style-type: none">• Poor Planning• Auto Fire• Restricted space	<ul style="list-style-type: none">• injury to personnel	C	2	<ul style="list-style-type: none">WZ-SBO-GP-003 (Handling Gun arrays on Deck)• Planned Maintenance• Experienced crew• JSA	B	2
4	Airgun operation and maintenance	<ul style="list-style-type: none">• Poor Planning	<ul style="list-style-type: none">• injury to personnel	C	2	<ul style="list-style-type: none">WZ-SBO-GP-004 (Airgun operation and maintenance).• Experienced crew• Training• lock Out Tag Out	B	2

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
5	Deployment and recovery of Barovane	•Poor Planning	•injury to personnel •Damaged Equipment	C	2	WZ-SBO-GP-005 (Deployment and recovery of Barovane). • JSA	B	2
6	Close Pass	•Poor Planning •Inexperienced marine crew •No procedures •Weather conditions /Strong currents	•injury to personnel •Loss of equipment •Damaged Equipment	B	4	WZ-VEO-SP-003-E (Close approach of an offshore installation). • PTW • MOPO	B	3
7	Simultaneous Operations (SIMOPS)	• Inadequate planning • Inadequate communication • Deteriorating weather conditions	•Loss of equipment •Damaged Equipment	C	3	• Inter department / vessel communications • PTW systems on all vessels. • MOPO • Navigation warnings	B	3
8	Working in Limited Space (Reel maintenance/repair)	• Inadequate planning • Inadequate communication • Deteriorating weather conditions	•injury to personnel •Damaged Equipment	C	2	• Communications • Proper PPE • JSA(19) • Lock Out Tag Out • Permit to Work	B	2
9	Moving & Rotating Parts	• No Guarding • Weather Conditions	•injury to personnel	C	3	• Guarding of Machinery • Back deck inductions	B	3

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
10	Streamer Deployment & Recovery	<ul style="list-style-type: none"> Poor Planning Lack of Procedures 	<ul style="list-style-type: none"> injury to personnel environmental damage 	C	2	WZ-SBO-GP-006 (Streamer Cable Deployment & Recovery) <ul style="list-style-type: none"> JSA MOPO SOPEP 	B	2
11	Attaching streamer peripherals	<ul style="list-style-type: none"> Poor Planning Poor communications Manual Handling 	<ul style="list-style-type: none"> injury to personnel Damaged Equipment 	C	2	<ul style="list-style-type: none"> Proper PPE JSA (13) Toolbox meeting Training (on the job) Buddy system 	B	2
12	Man Overboard	<ul style="list-style-type: none"> Poor Planning Poor communications Fatigued Rough weather 	<ul style="list-style-type: none"> personnel injury/fatality 	B	4	<ul style="list-style-type: none"> Proper Planning Training (on the job) MOPO PPE Buddy system 	B	2
13	Operation of hand tools	<ul style="list-style-type: none"> Poor Planning Poor maintenance 	<ul style="list-style-type: none"> Damaged Equipment injury to personnel 	C	2	<ul style="list-style-type: none"> Proper Planning Training (on the job) Designated operators PM program 	B	2
14	Communications	<ul style="list-style-type: none"> Poor Planning No clarity 	<ul style="list-style-type: none"> Damaged Equipment Injury to personnel 	C	3	<ul style="list-style-type: none"> Toolbox meeting Roles and Responsibilities 	B	3
Vessel operational Risks (Marine)								

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
15	Collision	<ul style="list-style-type: none"> • Mechanical Failure • Miscommunications • Poor Visibility • 3rd Parties 	<ul style="list-style-type: none"> • Injury • Damaged Equipment • Loss of Vessel 	C	3	<ul style="list-style-type: none"> • Redundant mechanical Systems • Collision Regulations (COLREG) • Chase Boat Lookout • Working Language • PMS 	B	3
16	Black Out	<ul style="list-style-type: none"> • Fuel Contamination • Mechanical Failure of Generators • Overload of Generators 	<ul style="list-style-type: none"> • Injury • Damaged Equipment 	C	3	<ul style="list-style-type: none"> • Fuel Testing • Onboard Testing • Filtration Systems • Power Management • Alarms • Monitoring • PMS • Emergency Generator • Manned Engine Room 	B	3
17	Fire on Vessel	<ul style="list-style-type: none"> • Hot work • No PTW system in place • Lack of training • No drills • Poor attitude to safety 	<ul style="list-style-type: none"> • Fatality • Sinking 	C	5	<ul style="list-style-type: none"> • Fire Monitoring and fire fighting systems. • Trained crew, dedicated fire teams. • Regular Drills • Dedicated smoking areas. • PTW for hot work • All personnel to receive induction tours at their respective work sites, including emergency evacuation 	B	3
18	Pollution (fuel oil)	<ul style="list-style-type: none"> • Poor maintenance • Lack of training • Poor Communications 	<ul style="list-style-type: none"> • Environmental damage • Fauna disturbance 	C	3	<ul style="list-style-type: none"> • Training • MARPOL procedures • Planned maintenance Systems • Refuel alongside ONLY 	B	3

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
19	Environmental Disturbance	<ul style="list-style-type: none"> Released Hazardous Materials Not Following Procedures Waste thrown over the side 	<ul style="list-style-type: none"> Destruction of Wildlife Environmental Damage Migration Interference 	C	3	<ul style="list-style-type: none"> MARPOL Disposal Procedures Isolation Containment Storage Supervision Training Soft start procedure JNCC Marine Mammal guidelines followed 	B	3
20	Substance Abuse (D&A) (Self-medication)	<ul style="list-style-type: none"> Unfit for work Short term workers 	<ul style="list-style-type: none"> Serious Injury (LTI) 	C	3	<ul style="list-style-type: none"> Communication of D&A Policy / Program Hazardous Drug Register and secure Drug Cabinet Medical examinations Induction procedure Work Observation program 	B	3
21	Simulation Operations (SIMOPS)	<ul style="list-style-type: none"> Inadequate planning/ communication Deteriorating weather conditions Cable Vessel Ops unaware of source vessel operational plan (and chase vessels) 	<ul style="list-style-type: none"> Loss of equipment Damaged Equipment 	C	3	<ul style="list-style-type: none"> Briefings on both vessels, so all aware of all tasks. Clear & frequent communications between vessels PTW systems on all vessels. MOPO 	B	3

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
22	Small Boat Operations	<ul style="list-style-type: none"> Weather conditions Loss of control Equipment failure Method of transfer Lack of communication Inadequate training 	<ul style="list-style-type: none"> Serious injury MOB 	C	3	<ul style="list-style-type: none"> No crew changes are planned by boat Procedure Personnel transfer by boat MOB Contingency PTW for Small Boat Launches Toolbox Meeting before all launches MOPO Procedures in place Permit system in place for Crane/Lifting Ops Experienced crew Daylight operations only Not for routine crew changes etc Toolbox meeting before each launch with all vessels (via radio) Guard vessel on site as spotter/flotation aid supplier. Correct PPE Drinking water Step back 5x5 Self righting capability Good seamanship Training Qualified crew Certified equipment Maintenance Procedures FRC and/or Chase Boat as standby for rescue. UKOOA Medicals Workboat Node on Spectra Radio Communications and checks every 10 minutes Radio Redundancies Radar Reflector Night time operations only in Life Threatening situations 	B	3
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	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
23	Weather Conditions (rough seas, squalls)	<ul style="list-style-type: none"> • Short fair weather window for operations • Reliability of weather forecasting • Lifting (crane) operations • Back deck operations 	<ul style="list-style-type: none"> • Loss of equipment • Serious Injury • MOB, 	C	3	<ul style="list-style-type: none"> • Temporary suspension of operations • Operational planning to consider weather forecasts (historical weather information available) • PPE • Fall protection • MOB Contingency • MOPO 	B	3
24	Crane Operations	<ul style="list-style-type: none"> • Weather conditions • Visibility • Incorrect load handling • Equipment failure • Positioning of personnel / load 	<ul style="list-style-type: none"> • Serious injury • Personnel struck by swinging load, 	C	3	<ul style="list-style-type: none"> • Certification of lifting equipment and slings • Sling register • Trained Crane Operator • Operations planning (cease operations in poor weather conditions) • Communication • PTW 	B	3
25	Close pass	<ul style="list-style-type: none"> • Poor Planning • Strong Currents 	<ul style="list-style-type: none"> • Injury • Damaged Equipment • Collision 	C	3	<ul style="list-style-type: none"> • PTW • Close pass Procedure WZ-VEO-SP-003 • Training 	B	3
26	Management of Chase vessel	<ul style="list-style-type: none"> • Poor Planning • Poor communications 	<ul style="list-style-type: none"> • Damaged Equipment • Collision • Personal Injury 	C	3	<ul style="list-style-type: none"> • WZ-VEO-GP-001 (Management of escort vessel) • Vessel audit • Chase vessel crew induction 	B	2
27	Subcontractor Management	<ul style="list-style-type: none"> • Poor Planning • Poor communications • Different standards 	<ul style="list-style-type: none"> • Damaged Equipment • Personal Injury 	C	3	<ul style="list-style-type: none"> • Bridging documents • HSE Seminars 	B	3

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
Mobilization Risks (including safety inspection planning)								
28	Journey Management (Commercial ground Travel movement to / from the vessel)	<ul style="list-style-type: none">• External impacts• Journey timing• Local road conditions• Choice of ground transport	<ul style="list-style-type: none">•Serious injury (road accident)	B	5	<ul style="list-style-type: none">• Use of recognized taxi service, dedicated transport• Procedure WZ-VES-GP-001Personnel transportation by road	B	3
29	Vector bourne disease	<ul style="list-style-type: none">• Seasonal increase• Exposed crew• Poor Planning	<ul style="list-style-type: none">•Personal Injury	C	3	<ul style="list-style-type: none">• Country travel sheet• Use of insect repellent• Minimise exposure• Travel advisory• Batangas for mob & demob offshore (No port call/landings in Palawan)• Vector Control Program (if risk escalates)	B	3
30	Equipment Certification (load testing)	<ul style="list-style-type: none">• Poor Planning	<ul style="list-style-type: none">•Damaged Equipment•Personal Injury	C	2	<ul style="list-style-type: none">• Approved inspection methodology• Lifting & Towing appliances policy(WZ-SEO-SP-022)	B	2
Navigational critical activities (location specific HSE risks)								

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
31	Shipping Traffic	<ul style="list-style-type: none"> Poor Planning Communication problems Inadequate identification 	<ul style="list-style-type: none"> Equipment damage Collision Vessel Sinking 	B	5	<ul style="list-style-type: none"> Notices to Mariners issued Anti-collision radar Vessel identification system installed per ISPS GMDSS system in place Flares stocked onboard Communications 	B	2
32	Protocol for communications with bridge and back deck	<ul style="list-style-type: none"> Poor Planning Language problems 	<ul style="list-style-type: none"> Damaged Equipment Personal Injury 	C	3	<ul style="list-style-type: none"> Good Planning Clear line of communications Agreed station names & channels 	B	2
33	Transfer at sea	<ul style="list-style-type: none"> Weather conditions/Sea state Communication failure Inexperienced crew Poor Planning Excessive number of transfers Loss of Steering Engine Failure 	<ul style="list-style-type: none"> Vessels Collide Lost equipment Environmental Damage Hull Damage Personal Injury 	C	5	<ul style="list-style-type: none"> Procedures in place JSA Toolbox Risk Assessment (weather conditions) Check communication channels Constant communications Onshore re-supply whenever reasonably possible Mooring Lines correctly rigged & in good condition Experienced Masters (Maritime Skills) Daylight hours only Towing Drills Both vessel underway in forward motion Both Master to be in Agreement Crane operation procedures in place and followed 	C	2

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
34	Transponders preparation	<ul style="list-style-type: none"> Poor Planning Housekeeping 	<ul style="list-style-type: none"> Damaged Equipment Personal Injury 	C	2	<ul style="list-style-type: none"> Good Planning Toolbox meeting Storage rack 	B	2
35	Strong Currents	<ul style="list-style-type: none"> Equipment Control Navigation Obstacles Poor Planning 	<ul style="list-style-type: none"> Loss of Equipment 	C	2	<ul style="list-style-type: none"> Predictions Measurement Programs Planning Survey Design 	B	2
36	Velocity probe recording	<ul style="list-style-type: none"> Equipment Control Poor Planning 	<ul style="list-style-type: none"> Damaged Equipment Personal Injury 	C	2	<ul style="list-style-type: none"> Use Sippican good Planning Toolbox meeting PPE JSA (10) 	B	2

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequences	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
37	Interaction with local communities	<ul style="list-style-type: none"> Poor communications Aggressive attitude Lost or Discarded Fishing Gear/Debris Uncooperative Fishermen 	<ul style="list-style-type: none"> Personal Injury Damage to equipment Survey objective delay Fishing vessel gets gear entangled or cuts streamers Loss of in water equipment Fouling of propellers Long line gear entangled Miscommunication Collision Sinking of fishing vessel Inadvertent Towing Personnel Entanglement 	C	4	<ul style="list-style-type: none"> Pre survey community liaison Liaison Officer onboard chase boat Non Harassment policy Chase vessel personnel fluent Philippians speakers Sufficient & experienced chase vessels ISPS 	B	3
38	Fish Attracting device, mooring buoys	<ul style="list-style-type: none"> Poor planning No scouting High Fishing activity areas Poor visibility 	<ul style="list-style-type: none"> Personal Injury Equipment damage 	C	4	<ul style="list-style-type: none"> Pre survey scouting On line scouting Sufficient & experienced chase vessels Chase vessels equipped with proper clearing equipment Communications 	B	2

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequence	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
Human Behaviour (location specific HSE risks)								
39	Food supplies	<ul style="list-style-type: none">• Poor Planning• Inadequate transport methods• Poor quality goods• Sub-standard provider	Personal illness	C	2	<ul style="list-style-type: none">• Galley Inspections• Cleanliness routine maintained• Cold Stores Maintained at Correct Temperatures• Food Handlers Certified• Regular Medicals• SOP's• Signage	B	1
40	Infectious Diseases (General)	No MOH Audit Poor Hygienic Control Bad sanitation Poor Pest Control Lack of training domestic staff and food handlers No check of water supplies Stagnant water STD's transmission Shore risk of STD's	Medevac First Aid	D4	High	Medical attention Medic onboard Travel information sheet Available prophylactics	D2	Med

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequence	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
41	Health and Hygiene (Contaminated food and water)	Lack of pre-employment medical checks Inadequate sewage Lack of training domestic staff and food handlers Mandatory vaccination checks (HIV, Hepatitis) Improper food storage Rodents in storage areas Water tanks contaminated	Medevac First Aid Notification Investigation Reporting	D 3	High	Pre-Survey MOH audit Regular health & Hygiene audits Inspection of delivery chain Good planning and communications Cold stores maintained at required temperature	B 2	Low
42	Meteorological factor (Rain, squalls)	Chase boat operations disrupted by low visibility Collision with debris Risk of tripping Negative attitude towards HSE	Medevac First Aid Abandonment	D 3	High	Reduce vessel speed Chase vessels with Radars and clear screen Avoid heading into squall areas Coordination of chase vessels Pre-scout of acquisition area	C 2	Medium
43	Meteorological factor (Fast Currents)	Increase streamer feather and chances of collision with floating debris Rough weather associated with currents Excessive amount of obstruction Poor planning & Scouting	Medevac First Aid Abandonment	D 4	High	Adequate pre-scouting & clearing Provide extra scout vessel if required Good planning ERP's and drills	D 2	Medium
44	Work environment (Slippery Ground)	Inadequate footwear Fatigue/ Exhaustion Carrying heavy loads	Medevac First Aid	D 3	High	Training Awareness Ensure chase vessels have proper PPE Training of chase vessel crews Use of suitable docks for unloading Proper planning to ensure crews are not exposed to excessive working hours	D 2	Medium

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequence	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
45	Natural Environment (Floating debris)	High Speed Navigation in darkness Poor visibility Inexperienced coxswain Inadequate scouting	Medevac First Aid Abandonment Search & Rescue	C 3	Med	Properly equipped and trained scout vessels National QC team instigate community plan Deploy extra scouting as required Additional watch keeping onboard Pacific Titan Procedure for recovery of drifting materials Translator onboard Pacific Titan	B 2	Low
46	Equipment – Poor lightning	Bad weather Defective equipment / generator Poorly fitted lighting facilities	Medevac First Aid	D 3	High	Sufficient spares onboard Scout Vessel Audits Limit night scouting activities Install additional lights as required	D 2	Med
47	Equipment – Engine failure/ total propulsion loss	Contaminated Fuel Poor Maintenance Lack of spares	Abandonment Spillage Plan Search & Rescue Notification Investigation Reporting	C 3	High	Replacement vessels identified Qualified mechanics Maintain safe distance between vessels Communications Protocol Purchase fuel from reputable source Towing procedures Towing drills before survey	C 3	Low
48	Journey Management	No vehicle monitoring system No journey management proc. Failure to use seat belts Roll over Adverse weather conditions Poor segregation cargo and passengers Positioning and securing freight Wrong seating arrangement	Medevac First Aid Fire Fighting Fatality	D 4	High	Medevac Plan Journey Management Plan Qualified Drivers Enforce D&A policy Seat Belts on all vehicles Vehicles Monitoring systems in place	B 3	Med

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequence	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
49	Special Methods – diving	Poor fish attracting device recovery techniques Unfit diver Not licensed diver Inadequate equipment Danger in water fauna/ flora Poor visibility Cold, hypothermia Currents	Medevac First Aid Search & Rescue	B 4	High	Diving in open seas strictly prohibited Tow procedures in place between chase vessels Good communications	B 2	Low
50	Personal Behaviour	Failure of medical check Poor screening of personnel Personnel shortage in the industry Horseplay Overwork Self-Medication Narcotisation Influence by uncontrolled third party Language barrier Untrained crew Large number of sub-contractor	Notification Investigation Reporting	C 4	High	ERP Stop and train Translators on crew Medic on board Induction and training sessions Behaviour safety awareness training Chase Vessel coordinator on crew Audit of sub-contractors	B 3	Med
51	Personal Behaviour (Smoking)	No awareness Work stress Lack of company guidelines No smoking bans in public areas Furtive smoking Lack of designated smoking areas Lack of signage	Fire Fighting Medevac Notification Investigation Reporting	D 3	High	ERP Training and Induction Audit of Chase Vessels Correct Storage of flammable materials	C 2	Med

	Hazard Area	Factors affecting Gravity and / or Probability	Potential Consequence	Initial Risk Rating		Prevention / Mitigation Measures	Residual Risk Rating	
				Probability	Gravity		Probability	Gravity
52	Equipment – communications	Language difficulties Extreme weather Language handling during emergencies No licenses No training Incompatible Coms equipment Lack of communication procedures	Notification Investigation Reporting	B 5	High	Search and Rescue Equipment redundancy Emergency Generator Vessel Audits Chase Vessel Inductions Communications Protocol Journey Management Management escort vessel	C 1	Low
53	Personnel – Language Barriers	Notices and Instructions not in local language Noise Levels Problem compounded during emergencies Panic Multiple nationalities No translators Poor Planning	Notification Investigation Reporting	C 4	High	Recognize/ address miscommunications Repeat comms Request for understanding Refer comms to translators National QC's available in both languages Translator onboard Pacific Titan Procedure for lines of communication	B 1	Low
54	Personnel – Suitability for task	Poor project plan Poor sub-contractor assessment Inadequate training Large number of sub-contractors Different standards	Notification Investigation Reporting	C 3	High	Suspend contract Replace sub-contractor Training Procedures On-Going assessment	B 1	Low

APPENDIX 9: EMERGENCY COMMUNICATIONS

24 HOURS			
General Medical/Rescue Advice	Tel	Fax	Email
ISOS Sydney	+61 2 9372 2468	+61 2 9372 2455	
ISOS Singapore	+65 6338 7800		
AusSAR 24 hr contact	+61 2 6230 6811		
- Aviation Rescue	+61 1800 815 257		
- Maritime Emergency	+61 1800 641 792		
Victoria Air Ambulance	+61 1300 883 200		air.ambulance@mas.vic.gov.au

Pacific Titan	Tel/Fax	E-mail
Party Chief	+47 5140 7612	titan@cggveritas.com pacific.titan@swireships.com
VSat Bridge	+47 5140 7614	
Inmarsat Bridge	+872 356 304 510	
Iridium Bridge	+881 631 852 021	
Instrument Room	+47 5140 7611	

CGGVeritas Singapore Office		Tel	Mobile	E Mail
Serge LAIGRE	Vessel Operation Manager	+65 6723 5599	+65 9183 4109	serge.laigre@cggveritas.com
Bob Joyce	QHSE Manager	+65 6723 5565	+1 281 639 7170	Bob.Joyce@cggveritas.com
Christian Brige	CGGVeritas APAC Operations Manager	+65 6723 5621	+65 9852 1710	christian.brige@cggveritas.com

Consortium Members	Tel	Mobile	E Mail
Andrew White	+61 8 8116 7260	+61 417 086 407	Andrew.White@santos.com
Frank Renton	+61 4 1868 1314		F.Renton@enquest.com.au

SANTOS

Santos Incident Management Team (IMT) & Alternatives	Work	After Hours	Mobile	Fax
Activity Manager				
1. TBA				
Duty Incident Manager				
1. Roger Kennett	+61 8 8116 7846		0419 180 935	+61 8 8116 7965
2. Nick Lagonik	+61 8 8116 7349		0400 383 020	+61 8 8116 7113
3. Mark McFarlane	+61 8 8116 5269		0438 788 138	+61 8 8116 7113
4. Colin Cruickshank	+ 61 8 8116 7855		0419 169 254	+ 61 8 8116 7755
5. Dennis Vale	+61 8 8116 7651		0437 653 905	+61 8 8116 7113

Santos Emergency Response Team (ERT)	Work	After Hours	Mobile	Fax
Mike Giles (Project Manager)	+61 8 8116 7952		0437 816 312	+61 8 8116 7258
Andrew White (APM)	+61 8 8116 7260	+61 8 8332 2949	0417 086 407	+61 8 8116 7258
Stuart Brew	+61 8 8116 7625	+61 8 8278 7515	0412 552 055	+61 8 8116 7258
Nick Fox (HSE Manager)	+61 8 8116 5151	+61 8 8327 1594	0407 395 815	
Alan Jones (alternate)	+61 8 8116 7303	+61 8 8357 6212	0427 520 773	+61 8 8116 7258
Phillip Gatley (alternate)	+61 8 8116 7946	+61 8 8271 7532		+61 8 8116 7258

Fishing Vessel – SANTOS (M/V Shandara)

M/V SHANDARA	Position	Mobile	Satellite Phone	HF Radio
Jonathan (Jono) Hammond (Distinguishing mark: RDX2)	Skipper	+61 427 366 529	0145 115 342	VHF & UHF (Call sign VNM 4671)
John Hammond (Distinguishing mark: UX9)	Skipper	+61 429 130 238 +61 428 130 238		VHF & UHF (Call sign VJT 3639)

3D Oil Contact

3D Oil Ltd (Secondary Contact)	Work	After Hours	Mobile	Email
Jon Keall	03 9650 9866	03 5341 3669	0439 038 054	jkeall@3doil.com.au

Bass Straits Oil Company Contact

Bass Straits Oil Company (Secondary Contact)	Work	After Hours	Mobile	Email
Keith Jackson	03 9927 3000	03 9439 3552	0402 109 715	keith.jackson@bassoil.com.au

Cue Energy Resources Contact

Cue Energy Resources (Secondary Contact)	Work	After Hours	Mobile	Email
Desmond Leech	03 96708668	0422 981 139	0422 981 139	des.leech@cuenrg.com.au

Eagle Bay Resources Contact

Eagle Bay Resources (Secondary Contact)	Work	After Hours	Mobile	Email
Ian R Barr	08 9481 3322	08 9381 1181	0415 271 299	ianbarr@eaglebayresources.com.au

Exoil Contact

Exoil (Secondary Contact)	Work	After Hours	Mobile	Email
James Willis	03 8610 4711	03 9699 7439	0404 078 292	james.willis@albersgroup.com

Fishing Vessel – Exoil (M/V)

M/V	Position	Mobile	Satellite Phone	HF Radio

Tap Oil Contact

Tap Oil (Secondary Contact)	Work	After Hours	Mobile	Email
Emergency contact number	+61 (0)8 9226 7836 (24 Hrs)			
Blaine Ulmer	08 9226 7813	08 9271 4046	0409 483 932	blaine.ulmer@tapoil.com.au
Denise Long	08 9226 7809	08 9367 7583	0409 684 079	denise.long@tapoil.com.au
John Thornton			0404 830 788	john.thornton@tapoil.com.au

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Dick Watson	Office +(65) 6723 5411	mob: +(65) 9105 2403	Maritime Mgr
Phil Mellott	Office +(65) 6723 5414	mob: +(65) 9633 6874	Marine Contracts Sup
Jeff Cleland	Office +(65) 6723 5430	mob: +(65) 9186 3619	Equipment Mgr
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Paul Mier	Office +(61) 8 9214 6208	mob: +(61) 4479 5554	Assistant VOM - Australia

Agent & shore support in Australia N.T. Shipping Agencies Pty. Ltd.		Phone	Mobile	E-mail
Robbie Robertson	Assistant Manager	+61 8 8947 2570	+61 417 819 593	robbie@ntshipping.com.au
Oliver Barz	Alternative Contact		+61 418 894 359	

Melbourne Hospital

Address	Alfred Hospital
	Commercial Road, Prahran, Melbourne, Australia
Telephone	+61 3 9276 2000 / +61 03 9840 3500 (Switchboard)
Facsimile	+61 3 9276 2255 / +61 3 9840 3547

Address	Austin & Repatriation Medical Center
	Studley Road, Heidelberg, Melbourne, Australia 3084
Telephone	+61 3 9276 2000 / +61 3 9840 3500
Facsimile	+61 3 9276 2255

Burnie (Tasmania) Hospital

Address		North West Regional Hospital Brickport Road, Burnie, TAS 7320, Australia
Telephone		+61 3 6430 6666 / +61 3 6430 6524
Facsimile		

Portland Hospital

Address		Portland and District Hospital Bentinck Street, PORTLAND, Victoria 3305
Telephone		+61 3 5521 0333
Facsimile		+61 3 55 210 358

Lakes Entrance – Sale Hospital

Address		Central Gippsland Health Services Hospital Guthridge Parade, Sale 3850
Telephone		+61 3 5143 8600
Facsimile		+61 3 5143 8633

Eden Hospital

Address		Pambula District hospital Merimbula rd, Pambula NSW 2549
Telephone		+61 2 6495 6002

Australian Federal Authorities

Name	Contact Details
NOPSA 24 hr Incident Notification	+61 3 8866 5700
Department of Agriculture, Fisheries & Forestry (Switchboard)	+61 2 6272 3933
Department of Industry, Tourism & Resources (Switchboard)	+61 2 6213 6000
Victoria Police Centre Victoria Police Centre, 37 Flinders Street, Melbourne, VIC, 3005	(03) 9247 6666
Air Wing (Victoria Police) Victoria Police Hanger 104, Essendon Airport, VIC, 3041	Phone: (03) 9374 1311 Fax: (03) 9374 1929
Burnie Police Headquarters 88 Wilson Street, Burnie TAS 7320	Phone: (03) 6434 5211 Phone: (03) 6230 2700

Onshore

Name	Location	Contact Details
Police	Police Emergency	000
	Police Non urgent	131 444
Ambulance	Ambulance Emergency	000
	Air Ambulance (Victoria)	+61 3 9945 9911
Hospitals – Public Victoria	Royal Melbourne Hospital	03 9342 7000 (Ph) 03 9342 7666 (Ph – Emergency)
Hospitals – Public Tasmania	Royal Hobart Hospital (Public)	03 6222 8308 (Ph)
	Launceston General Hospital	03 6348 7111 (Ph)
	North West Regional Hospital (Burnie)	03 6430 6666 (Ph)
Medical Advice	International SOS Medical Support Singapore	+65 6338 7800 (24 hrs)
Airport	Melbourne	03 9297 1600 (Ph - Administration)
Airport	Hobart	03 6212 1600 (Ph - Administration)
Airport	Launceston	03 6391 6222 (Ph - Administration)

Name	Location	Contact Details
Australian Search and Rescue (ASAR)		1800 641 792 (Ph within Australia) +61 2 6230 6811 (Ph Outside Aust.) +61 2 6279 5719 (Ph Outside Aust.) +61 2 6279 5712 (Ph Outside Aust.)
Australian Maritime Safety Organization		08 9478 3388 (Ph) 08 9430 2121 (Fax)
Minerals Resources Tasmania Petroleum Emergency Contact	Hobart	Carol Bacon 03 6233 8326 (Ph Bus Hrs) 03 6239 1409 (Ph after hours) Chris Boron 03 6233 8362 (Ph Bus Hrs) 03 6272 4862 (Ph after hours)
Maritime Rescue Coordination Centre		02 6230 6811 (Ph) 02 6230 6868 (Fax)

APPENDIX 10: ACTIONS TO BE TAKEN IN EVENT OF UNAUTHORISED BOARDING

The following measures are designed to deter any potential unauthorised boarding of the vessel:

1. During hrs of darkness keep all deck lights on
2. Maintain a sharp lookout, especially during hrs of darkness and challenge any vessels approaching close
3. In the event of unauthorised boarding attempt the vessel fire monitor can be used to deter boarders from getting onboard

If unauthorised boarding occurs remain calm:

1. Be firm but polite
2. If boarders are aggressive do not resist
3. Inform boarders that they are performing an illegal act and that they are required to leave the vessel immediately
4. Inform local authorities immediately
5. Attempt to gain as much evidence as possible, photographs etc but do not jeopardise personal safety in doing so

APPENDIX 11: SEVERE WEATHER CONTINGENCY PLAN (CYCLONE)

In the event of information being received indicating the possibility, of cyclone weather conditions developing in the region during the period of the project, the Master, Party Chief and Vessel Operation Manager should ensure that they maintain frequent communications with each other until either a definite typhoon is identified or the weather alert is cancelled.

The Master is ultimately responsible for the timely interpretation and decision making with respect to weather and its effect on the safety of the vessel, and will ensure the vessel is receiving all available information on typhoon movements.

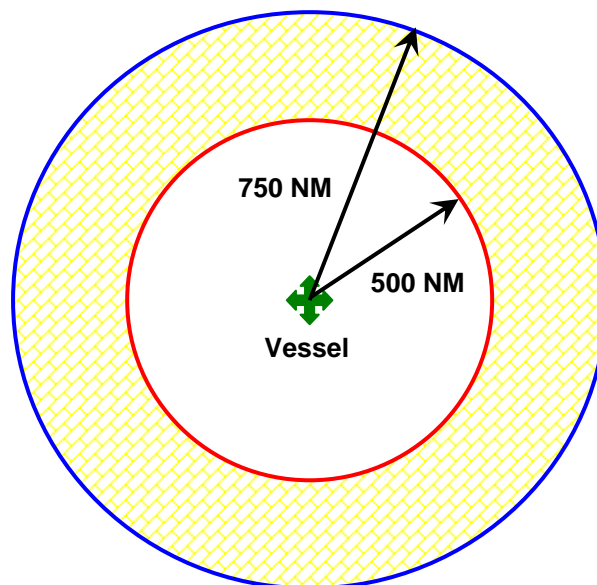
The following coding is to be used when reporting such weather information to the operations office, and appropriate actions are to be followed.

Blue - A cyclone exists within 750 nautical miles of the location
If cyclone is on a heading towards the vessel, monitor the speed and direction every 4 hours.

Yellow - A cyclone exists between 500 and 750 nautical miles of the location
If cyclone is on a heading towards the vessel, monitor the speed and direction every 2 hours. Consider retrieving towed equipment and move away from the cyclone path.

Red - A cyclone exists within 500 nautical miles of the location
If the cyclone is on a heading towards the vessel, monitor the speed, direction and commence retrieval of towed equipment and move away from the cyclone path.

The master will take into account sea conditions, speed and path of the storm, fuel onboard and time required to retrieve all trailing equipment, and has the authority to change the above parameters.



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APPENDIX 12: SAFE NAVIGATION AREA

Refer to controlled Document: SNA "Safe Navigation Area" :

Ps: Documents not yet fully issue.