

**SEISMIC
DATA ACQUISITION REPORT**

ANTARES 3D MSS

**BLOCK: VIC P/37(V)
OFFSHORE VICTORIA**

CONTRACTOR: PGS

**FROM 17TH OCTOBER 2003
TO 12TH NOVEMBER 2003**

FOR

WOODSIDE ENERGY LIMITED

Report prepared by Ken Haig

Report No. 1368



Exploration Consultants Australia Pty. Ltd.

Level 1, 610 Murray Street, West Perth

West Australia 6005 Australia

Tel: +61 (8) 9322 4333 Fax: +61 (8) 9322 7254 Email: office@ecl.com.au

Website: <http://www.ecqc.com>

TABLE OF CONTENTS

1.0 INTRODUCTION**2.0 SUMMARY****2.1 PROGRAMME***2.1.1 Prospect Area**2.1.2 Survey Description**2.1.3 Line Numbering**2.1.4 Shotpoint Numbering**2.1.5 3D Grid Definition**2.1.6 Time Zone***2.2 SURVEY METHOD***2.2.1 Vessel and Equipment**2.2.2 Seismic Recording**2.2.3 Energy Source**2.2.4 Navigation and Positioning**2.2.4.1 Tailbuoy and Streamer Positioning**2.2.4.2 Robtrack (Automatic Steering)**2.2.4.3 Echosounder**2.2.5 3D Acquisition**2.2.6 Quality Control and Onboard Processing***2.3 OVERVIEW OF OPERATIONS****2.4 CONTRACTORS****2.5 SIGNIFICANT DATES****2.6 ACQUISITION PARAMETERS***2.6.1 General Information**2.6.2 Survey**2.6.3 Recording**2.6.4 Streamer**2.6.5 Energy Source*

- 2.6.6 *Navigation and Positioning*
- 2.6.7 *Geodetic Information*
 - 2.6.7.1 *Datums*
 - 2.6.7.2 *Datum Shift/Transformation*
 - 2.6.7.3 *Map Projection*
 - 2.6.7.4 *Block Boundary*
 - 2.6.7.5 *3D Grid Specifications*
- 2.6.8 *3D Binning System and Offsets*
 - 2.6.8.1 *Online Binning System*

2.7 MODIFICATIONS TO SPECIFICATIONS

3.0 PRODUCTION AND TIMING DETAILS

3.1 PRODUCTION BREAKDOWN

3.2 TIME BREAKDOWN ANALYSIS

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL

- 4.1.1 *Conclusions*
- 4.1.2 *Recommendations*

4.2 RECORDING SYSTEM

- 4.2.1 *Conclusions*
- 4.2.2 *Recommendations*

4.3 STREAMER SYSTEM

- 4.3.1 *Conclusions*
- 4.3.2 *Recommendations*

4.4 SOURCE SYSTEM

- 4.4.1 *Conclusions*
- 4.4.2 *Recommendations*

4.5 SEISMIC QUALITY CONTROL PROCESSING SYSTEM

- 4.5.1 *Conclusions*
- 4.5.2 *Recommendations*

4.6 NAVIGATION SYSTEM

4.6.1 Conclusions

4.6.2 Recommendations

4.7 NAVIGATION PROCESSING SYSTEM

4.7.1 Conclusions

4.7.2 Recommendations

4.8 3D BINNING AND INFILL

4.8.1 Conclusions

4.8.2 Recommendations

4.9 SURVEY VESSEL AND CREW

4.9.1 Conclusions

4.9.2 Recommendations

4.10 HEALTH, SAFETY AND ENVIRONMENT

4.10.1 Health

4.10.1.1 Conclusions

4.10.1.2 Recommendations

4.10.2 Safety

4.10.2.1 Conclusions

4.10.2.2 Recommendations

4.10.3 Environment

4.10.3.1 Conclusions

4.10.3.2 Recommendations

5.0 QUALITY CONTROL

5.1 GENERAL

5.1.1 Observations

5.1.2 Data Edits

5.1.3 SIEP Start-up and Instrument Tests

5.2 RECORDING SYSTEM

5.2.1 Observations

5.2.2 *Failures and Repairs*

5.3 STREAMER SYSTEM

5.3.1 *Observations*

5.3.2 *Failures and Repairs*

5.4 SOURCE SYSTEM

5.4.1 *Observations*

5.4.2 *Failures and Repairs*

5.5 NAVIGATION SYSTEM

5.5.1 *Observations*

5.5.2 *Failures and Repairs*

5.6 3D BINNING AND INFILL

5.6.1 *Observations*

5.7 SURVEY VESSEL AND CREW

5.7.1 *Observations*

5.7.2 *Failures and Repairs*

5.8 HEALTH, SAFETY AND ENVIRONMENT

5.8.1 *Health*

5.8.2 *Safety*

5.8.2.1 *General Observations*

5.8.2.2 *Drills, Musters and Exercises*

5.8.2.3 *Safety Training*

5.8.2.4 *Onboard Safety Equipment*

5.8.2.5 *Protective Personal Equipment*

5.8.2.6 *Reporting Procedures*

5.8.2.7 *Meetings and Reporting*

5.8.2.8 *Safety Audits*

5.8.2.9 *Helicopter Operations*

5.8.2.10 *Rescue Boat and Work Boats*

5.8.2.11 *Resupply and Chase Boats*

5.8.2.12 *Chase Boat Fuel Consumption.*

5.8.3 *Environment*

5.8.3.1 *General Observations*

5.8.3.2 *Weather*

5.8.3.3 *Tides and Currents*

5.8.3.4 *Hazards – Drilling Rigs, Reefs, Fishing, Shipping, Eco-tourism, Debris, Piracy, Sharks*

5.8.3.5 *External Seismic Interference*

5.8.3.6 *Sea Life Monitoring*

6.0 DAILY DIARIES

6.1 DAILY DIARY

6.2 HEALTH, SAFETY AND ENVIRONMENT DIARY

7.0 DAILY PRODUCTION LOG

7.1 DAILY PRODUCTION LOG

8.0 APPENDICES

APPENDIX A: LOCATION CHART AND LINE ACQUISITION LAYOUT

APPENDIX B: SAIL-LINES AND BLOCK COORDINATES

APPENDIX C: VESSEL AND STREAMER TOWING SET-UP

APPENDIX D: ARRAY DROPOUTS, DESIGN AND TIMING

APPENDIX E: CREW LISTS

APPENDIX F: MINUTES OF MEETINGS AND DRILLS

APPENDIX G: HEALTH, SAFETY AND ENVIRONMENT PERFORMANCE

APPENDIX I: WEATHER OBSERVATIONS

APPENDIX J: LINE CHANGE TIME, SPEED AND TAILBUOY FEATHER

APPENDIX K: CONTRACTOR DOWNTIME STATISTICS

APPENDIX L: PRODUCTION AND TIMING STATISTICS

APPENDIX M: SEISMIC TAPE LOG

APPENDIX N: SEISMIC LINE LOG

APPENDIX O: SEQUENCE LINE QUALITY CONTROL REMARKS

APPENDIX P: STOP CARDS AND HAZARD REPORTS

1.0 INTRODUCTION

The scope of this report covers the seismic quality control supervision and health, safety and environmental management on behalf of Woodside Energy Limited (referred to as WEL), for the 2003 offshore Victoria, Australia, Antares 3D marine seismic survey, as produced by the onboard quality control representative.

The survey was situated across survey block, Vic P/37(v), offshore Victoria, Australia. Refer to charts in Appendix A for actual location and survey layout with identifying landmarks.

The survey encompassed an area of 211.45 square kilometres.

The final full-fold Prime CMP kilometres were 8,458.05 and the infill acquisition amounted to 14.64 percent (1,236.45 kilometres) of the total survey area.

PGS was contracted to acquire the seismic data using the survey vessel M/V ORIENT EXPLORER. Exploration Consultants Australia Pty Ltd was contracted to supply the client representative, Ken Haig for the duration of the survey.

The navigation quality control was undertaken by Stephen Burt, a consultant from EDR Hydrosearch. It was his responsibility to produce an independent report of all navigation issues encountered during the survey.

The client representative's time spent on-board was utilised for both real-time data quality control and the monitoring of the WEL health, safety and environment assurance requirements. The quality control included overseeing the data acquisition logs, compilation of daily quality control reports, and a comprehensive final report. Computer hardware and software was provided by the client representative to enhance the quality control effort. The daily and weekly reports were sent to the WEL Perth office, and were used onboard to compare the totals for the daily kilometres and chargeable time periods with those generated by the party chief from PGS.

Considerable time was also utilised with the investigation and reporting of the health, safety and environmental management systems in place on the M/V ORIENT EXPLORER. This involved actively engaging in all drills, safety meetings and training courses conducted on the vessel.

The main objectives for the survey were as follows:-

- The overall objective was to conduct and complete the survey, whilst maintaining the highest acquisition and health, safety and environment standards possible.
- The acquisition objective of the survey was to acquire full-fold coverage over a designated survey area.
- The positioning objective was to position the vessel and trailing equipment accurately.
- The geophysical objective was to acquire high quality seismic data.
- The health, safety and environmental objectives were to complete the survey in the safest manner possible, according to internationally recognised standards, while maintaining health and safety standards for all involved parties, and with little or no disruption to the environment.

The extent to which these objectives were achieved during the survey is outlined in the remainder of this report.

2.0 SUMMARY

2.1 PROGRAMME

2.1.1 Prospect Area

The survey area was located offshore Victoria in Block Vic P/37(v). The appropriate centre of the prospect area, 38 degrees 35 minutes south, 142 degrees 45 minutes east, was located 115 kilometres southeast of Portland, between Logan's Beach, Warrnambool and Port Campbell. The closest part of the survey to the coastline was approximately 900 metres.

There were no man-made obstructions, oil-field installations in the survey area. There were 2 sub-sea wellheads (Minerva 3 and Minerva 4), plus a pipe laying barge, SEMAC1 on location running from near Port Campbell to the Minerva locations, all located within 3 miles of the south-eastern survey extremity.

Water depths varied from 15 to 63 metres.

Block boundary co-ordinates were:

Northing	Easting
635788.17	5734696.87
639655.90	5740044.83
667520.90	5719892.46
665226.28	5716719.65
652701.69	5722464.78

Refer to the Appendix A of this report for location charts, depicting the survey area and prominent landmarks and townships along the coast.

2.1.2 Survey Description

Lines were positioned, in a north-west/south-east direction with an average line length of 32 kilometres. In all it had been planned to acquire 33 prime seismic lines. At the end of each line it was necessary to continue for an additional 2.025 kilometres (half the active streamer length) to achieve full fold coverage on the last pre-plotted shotpoint location. The area covered by the survey was calculated at 210.24 square kilometres full-fold.

Line direction was 305 degrees and the reciprocal 125 degrees.

Using the 4 streamer configuration and a dual source, 8 sub-surface lines of seismic data were acquired with each single ship-track or pass across the survey area.

Production totals calculated from co-ordinates supplied were:

Block Square kilometres (Estimated):	210.24
Total Number of sail-lines:	33
Total Vessel Traverse Kilometres:	1051.2
Total CMP full-fold Kilometres:	8,409.6
Total CMP Line Kilometres Including Run-Outs	8,944.2
Runout Shotpoints Required For Full-Fold Coverage:	108 x 18.75 m = 2.025 km
Columns Per Sail-Line:	8
CMP Lines to be Acquired:	264

Actual production totals are listed below:

Prime	
Full-Fold Square Kilometres:	211.45125
Full-Fold Sail Line Kilometres:	1,057.2562
Full-Fold CMP Kilometres:	8,458.05
Sail CMP Kilometres Including Runout:	8,992.65
Charged Sail-line Kilometres Including Runouts:	1,124.0815
Infill	
Full-Fold Square Kilometres:	30.91125
Full-Fold Sail Line Kilometres:	154.48125
Full-Fold CMP Kilometres:	1236.450
Sailed CMP Kilometres Including Runout:	1316.85
Charged Sail-Line Kilometres Including Runout:	164.60625

Charts depicting location and survey layout are included in Appendix A to this report and the line co-ordinates are listed in Appendix B.

2.1.3 Line Numbering

The towing geometry of the 4 streamers and 2 energy-sources meant that, for each sail-line, 8 sub-surface lines were acquired for each pass of the vessel. The CMP line numbers extended from 1001 in the south-west of the survey, incrementing by 8, to 1260 on the southern border extremity.

The line number convention used throughout is listed below.

W03ANT-XXXXP1	where:-
W	indicates the company Woodside
03	indicates the year of the commencement of the survey - 2003
ANT	indicates the survey name - Antares
xxxx	four digit line identification number
P	indicates line type (P-prime, R-reshoot, I-infill)
1	indicates the number of attempts at the line segment. (eg.-1,2,3, etc)

2.1.4 Shotpoint Numbering

The shotpoint numbering was such that the lowest number, 1001, was to the north and north-west side of the grid. This meant that lines traversed in the south-easterly direction had incrementing shotpoint numbers while the lines traversed to the north-west had decrementing shotpoint numbers.

The navigation reference point (NRP) was designated as the main navigation antenna at sea level. The first chargeable shotpoint was designated as the point where the common mid-point (CMP - the mid-point between the centre of the two source arrays and the centre near groups of all streamers) was positioned over the pre-plotted start co-ordinate of the line. The navigation system was configured so that, when this occurred, the number assigned to this shotpoint was equal to the first designated shotpoint number of the line. This system also meant that when the CMP was over the last pre-plotted point of the line, the shotpoint number was equal to the last pre-plotted shotpoint of the line.

A 2,025 metre (108 shotpoints, half the streamer length of 4,050 metres), run-out was added to the end of each pre-plotted line in order to achieve full-fold coverage on the grid area.

2.1.5 3D Grid Definition

The grid covering the survey area was divided into 'bins'. The dimension of each bin was made up of a bin length and bin width. The bin length was defined as a function of the shotpoint interval and group interval, in the sub-surface line direction. The bin width was equivalent to a function of the spacing between the sub-surface lines.

The sub-surface line spacing was 25 metres, the group interval was 12.5 metres and the in-line shotpoint distance for each source array was 37.50 metres. This meant that the grid bin size was 25 metres cross-line and 12.5 metres in-line.

2.1.6 Time Zone

The vessel local time was based on the local Australian Eastern Time (AET), which was UTC plus 10 hours. All times in this report are with reference to this local time.

All recorded seismic and navigation data is logged in GMT.

2.2 SURVEY METHOD

2.2.1 Vessel and Equipment

Seismic data was acquired using the M/V ORIENT EXPLORER, towing 4 by 4050 metre long digital streamers and firing alternately, (flip-flop) 2 by 2,500 cubic inch source arrays. Each streamer contained 324 hydrophone groups spaced at an interval of 12.5 metres. Each source array consisted of 2 strings, with up to 8 compressed airguns per string firing at a nominal pressure of 1,800 pounds per square inch. Each streamer was separated by 100 metres, giving a total spread width of 300 metres. A distance of 50 metres separated the source arrays from each other. Towing depth of the streamers was 7.5 metres, plus or minus one metre, and the source array was 6 metres plus or minus 1 metre. Due to the consistent swell conditions streamer depth was set at 8 metres throughout to minimise and reduce the effects of swell noise interference. Depth specification allowed for a one metre variation from the target depth of 7.5 metres.

The vessel was required to travel along pre-plotted lines of a 3D grid, towing the trailing equipment, firing the energy source and collecting data for 6.0 seconds from the streamers every 18.75 metres of vessel travel. An energy source was fired at each shotpoint interval of 18.75 metres. Firing alternately between two source arrays meant that there was a distance of 37.50 metres between the successive firing of the same energy source array.

2.2.2 Seismic Recording

The reflected seismic data was collected via the 324 channels in each streamer on each shotpoint, and recorded by the Syntrak Recording interfaced to 4 digital seismic streamers, using a 2 millisecond sample rate and a 6 second record length. The acquisition filters were low cut 3 Hertz at 12 decibels per octave, and high cut 206 Hertz at 276 decibels per Octave. Noise records, taken prior to and at the completion of each line, were displayed with an 8 Hertz low-cut filter setting to simplify the visual quality control of the records. Data was recorded in SEG-D, 8058 format on IBM 3590 tape drives. Data tape duplication was made off-line, after acquisition. Separate data shipments were maintained for both the original and duplicate data sets.

Woodside supplied specific tape labels for both the original and copy tapes.

2.2.3 Energy Source

Two energy sources were available for the survey, with each energy source consisting of Bolt airguns. The capacity of each source array was 2,500 cubic inches. Firing at a nominal pressure of 1,800 psi, each source consisted of 2 sub-arrays. Each sub-array was configured with various gun sizes to make up the total source array volume. Spare guns were also included in the sub-arrays. Near-field hydrophones and depth indicators were included in the gun array configuration. Operational towing depth of the arrays was 6 metres, plus or minus 0.5 metres. Refer to Appendix C for the schematics of the gun array and system timing details.

2.2.4 Navigation and Positioning

The integrated navigation control system was the SPECTRA system. This took in positioning data from MRdGPS, SeaDiff and MultiFix GPS navigation systems able to provide stable vessel and tailbuoy

positioning. Sonardyne acoustic ranges were also available in conjunction with DigiCourse compasses for improved streamer shape, and tail buoy positioning.

Mr Stephen Burt of EDR Hydrosearch was on the vessel throughout the survey as an independent navigation quality controller. If further information is required on navigation and positioning criteria and statistical performance it is recommended the reader consult his separate operations report.

2.2.4.1 Tailbuoy and Streamer Positioning

Each of the 4 tailbuoys was equipped with an individual rGPS unit, and SIPS 1, Sonardyne acoustic transceivers attached. These, systems, when combined with streamer DigiCourse 5011 compasses, the Sonardyne mid-streamer, and front acoustic networks, made way for good cable-shape determination and cable positioning.

Refer to the independent navigation and position report for full details of all navigations systems and set-up.

2.2.4.2 Robtrack (Automatic Steering)

Steering of the vessel was through Robtrack, a computer based system used to steer the vessel onto line, and to steer with manually entered offsets during data acquisition. The navigators had full control of the system, and there was the option to override the system from the Bridge controls at any time during acquisition. During line changes, the system automatically steered the vessel through pre-plotted turns to ensure optimum turning circles were achieved. Input to the system was via the SPECTRA real-time binning system, again to ensure maximum coverage was being acquired at all times.

2.2.4.3 Echosounder

The vessel was equipped with an Atlas Deso 25 echosounder. The unit was operational throughout the survey, and water depths were recorded on all lines. Velocity input to the unit was 1,500 metres per second and this remained constant on all raw recorded data. Velocity corrections were input later in post processing. The same applied to draft correction of the echosounder.

Unfortunately weather and swell conditions did not allow for daily or regular TS dips to be recorded.

Manufacturer:	Atlas Deso
Type and Model:	25, 210 KHz
Frequency:	38 KHz/210 KHz (master) (38 kHz range not operating)
Maximum Sounding Depth:	21,500-2,000 m
Velocity Correct Input:	1,500 m/s (velocity corrected - navigation post processing)
Transducer Draft Depth Correction:	0.0 m on raw data (draft corrected - navigation post processing)

2.2.5 3D Acquisition

While shooting 8 CDP prime lines with one sail-line pass, the technique adopted was to steer the vessel to obtain maximum coverage on the designated 'group 2s' set of data ranges. This involved butting up to previous coverage to obtain sufficient coverage of the streamer offsets without leaving any gaps. In order to ensure there was no loss of coverage in the far segments, it was necessary at times to move the vessel over one or more CDP lines, resulting in overlapped near-offset and mid-offset coverage. After a series of adjacent lines had been collected using this technique, the vessel eventually had to move over more than 4 CDP lines from the pre-plotted sail line. At this time the pass was designated an infill line. This method was used in order to help overcome any differences in feather matching by effectively moving the missed coverage to the virgin edge of the 8 CDP lines being acquired.

2.2.6 Quality Control and Onboard Processing

The quality control of the data acquisition process was achieved via a number of onboard computers, video displays, printers, plotters, and status panels. These various items of equipment were used extensively by the onboard personnel to check the integrity of the acquired raw data. Both seismic and navigation processing systems were used to provide post line analysis.

Two personnel operated the Cobra onboard processing system in addition to a Promax system.

Cobra produced brute Stacks for each line and a common offset cube.

Promax was used for RMS analysis and velocity picking on the first line acquired and then continuing on a 2 km inline grid. Velocities were picked on every other sail-line.

Data and navigation shipments were made to coincide with supply runs and port calls.

2.3 OVERVIEW OF OPERATIONS

The M/V ORIENT EXPLORER arrived in Portland Victoria at 11:00 hours local time on October 17th, 2003. The vessel had recently completed a transit from Singapore, where the Australian maritime crew had joined the vessel.

On arrival in Portland, the Woodside management and client representatives joined the vessel. A vessel health, safety and environment audit was conducted by Woodside, and this included a helideck inspection. The Australian Maritime Safety Association (AMSA) also conducted their own safety audit and the findings of both audits were promptly addressed, albeit vessel sailing and departure from Portland was delayed by some 24 hours to complete required welding and hardware repairs.

A full crew health, safety and environment induction was presented by Woodside prior to departure.

The vessel finally departed Portland at 12:00 hours local time on 19th October, in transit to a pre-determined streamer deployment location. Conditions during the transit were only fair with winds up to 25 knots, associated with a 2.5 metre swell being reported.

Streamer deployment commenced at 16:15 hours on 19th October and generally conditions deteriorated from that time until 18:00 hours on 20th October when winds of 30 knots and a swell of 5 metres forced the abandonment and cancellation of any further streamer deployment. Streamers 4 and 1 were recovered and the vessel returned to anchor in Portland Bay until conditions improved.

Two support vessels, the SOUTHERN SALVOR and PERFECT LADY, also left the survey in search of shelter until conditions improved.

The 21st October, was a full day of weather standby at anchor in Portland with the vessel finally departing in the morning of 22nd October to conduct emergency towing tests in the calmer waters of Portland Bay. These tests were undertaken in unison with the SOUTHERN SALVOR and the towing vessel in case of any engine problems which may be experienced by the M/V ORIENT EXPLORER when operating very close in-shore during the survey operations. Meanwhile the PERFECT LADY, the second support vessel, remained alongside in Port Fairy, departing later in the day for the survey area.

On the satisfactory completion of the towing tests the M/V ORIENT EXPLORER continued out to sea and deep water to continue with streamer deployments. Conditions were marginal again at this time with winds of 25 knots and swell of 2 to 3 metres. However, it was still safe to continue with the deployment of streamers in these conditions.

Streamers and source were deployed by 15:23 hours local time on Friday October 24th and the streamer tests, offset determination and source testing followed. There were problems with array stability and this was possibly due to 4 weeks inactivity and storage on the back deck prior to arrival at this survey.

The last shotpoint was recorded on 11th November, 2003, line 1060P2, at 16:37 hours local time.

Following this, 3 streamers were recovered and this was classified as de-mobilisation. The vessel then remained in the general vicinity and commenced a 2D seismic programme on behalf of Santos.

The vessel completed the demobilisation on 12th November, 2003 at 12:00 hours local time after completing the retrieval of the 3 streamers, plus one hour's additional demobilisation time as agreed by PGS and Woodside.

Following are condensed weekly operations reports recorded during the survey:-

Week 1 (17th Oct – 19th Oct)

No Production.

The period started with the M/V ORIENT EXPLORER arriving in Portland at 11:00 hours on 17th Oct. Bunkers were loaded and a health safety and environment audit of the vessel and heli-deck were completed by both Woodside and AMSA. Woodside conducted a health, safety and environment introduction, and presentation for all available crew at the time.

A survey start-up meeting was carried out and all parties were supplied with health, safety and environment, project manuals and charts for the planned forth-coming survey. Particular attention was given to the health, safety and environment aspect of the survey and the environmental requirements with regard to whale observations and reporting requirements throughout.

Streamer deployment commenced at 16:00 hours on 19th October, with the vessel some 12 nautical miles south of the survey area in deep, clear and unobstructed waters.

Weather and sea conditions during this period were very unstable and gradually deteriorated making back deck work operations slow and hazardous. Seas were moderate to rough up to 5 metres with winds of 30 knots.

There were no accidents or lost time incidents reported.

There was no spillage of oil overboard or loss of containment.

There were no whale or cetacean sightings – whale watches were in place on departure from Portland.

Week 2 (20th Oct – 26th Oct)

Sail-line km: 204.994

CMP: 1639.95

Deployment of streamers 4 and 1 continued during the week changeover, but sea conditions continued to deteriorate and it was deemed unsafe for the crew to continue back deck work. Both streamers were recovered and the vessel steamed to Portland to anchor until conditions and forecasts showed some sign of improvement. Meanwhile the PERFECT LADY remained in Port Fairy and the SOUTHERN SALVOR returned to Portland with the M/V ORIENT EXPLORER. Winds were a consistent 25 to 30 knots with a swell of up to 5 metres at times.

Towing tests were carried in Portland Bay on 22nd and cable deployment continued. Streamer deployment continued after towing tests and all streamers were deployed by 24th Oct. Some minor ballasting is still required.

Source deployed and operation by 15:23 hours, 24th October. This was inside the 24 hour limit imposed from completion of the cetacean aerial survey.

The first acquisition line was completed on 25th October in fair weather and sea conditions. Conditions deteriorated slightly and some swell noise was observed on the following lines to varying degrees of severity. Since then acquisition has been continuing.

At the close of the period, the vessel was on line change to line 1100 - heading south-east in fair weather and sea conditions.

The pipe laying barge, SEMAC 1 arrived on location and at the end of the period was being towed into position near Port Campbell on 27th October.

There were no accidents or lost time incidents reported.

There was no spillage of oil overboard or loss of containment.

There were no whale or cetacean sightings – whale watches were in place on departure from Portland.

Week 3 (27th Oct – 02nd Nov)

Sail-line km: 252.469

CMP: 2019.75

Continuing acquisition in acceptable weather and sea conditions. Commence recovery of all equipment on completion of sequence 013 and travel to Portland for a scheduled crew change.

Complete crew change and depart Portland on 29th October at 17:30 hours local time. Run towing test en route to the survey with the new marine crew onboard.

Begin deployment of streamer 1 at 18:20 hours local time - conditions marginal with winds of 20 knots and a sea and swell of 2 metres. Continue with deployment through 30th and 31st October. Conditions deteriorated considerably on 31st October, late morning and early afternoon, with seas reaching 4 metres and winds gusting to 40 knots at times. Once all streamers were deployed and the vessel was ready to continue with acquisition the crew was forced into a period of weather standby.

Acquisition finally commenced on 1st November but there were problems with cable ballast, control and instrumentation.

Streamer 4 had to be recovered for front-end reballasting after sequence 015 and further production was lost. At the close of the period the crew were still trying to adjust the balance at the head of streamer 4. Considerable time has been spent during this operation and a lot of production time has been lost.

No accidents or lost time injuries reported. No spillage of oil overboard or loss of containment. Whale watches have been maintained and soft start procedures for source arrays applied in all cases as required. An aerial survey of the area was completed on 31st Oct prior to starting airguns. No cetaceans reported as is the case from the vessel for the remainder of the week.

Woodside conducted a health, safety and environment induction for the on-coming crew in Portland on the day of the crew change.

On departure a tow test with the SOUTHERN SALVOR was conducted for the benefit of the marine crew. The test went well with a tow hook-up time of 15 minutes observed.

30th October - conducted vessel abandon ship/emergency drill. All crew mustered on the heli-deck, checked life jacket status and were given a demonstration and instruction on donning survival suits.

01st November - HSE audit and inspection and review of audit action points by Captain and PC.

02nd November - fire drill, followed by debrief. A safety committee was then held for the department chiefs, party chief, Captains and client representatives. All action points raised in earlier audits were discussed and effectively closed out. Minutes of the meeting will be forwarded to Woodside when available.

Week 4 (03rd Nov – 09th Nov)

Sail-line km: 1202.681

CMP: 9,523.500

Continue with attempts to rebalance the front of streamer 4 in moderate sea and swell conditions. Replace lead-in of streamer and make minor ballast adjustments at the tail-end of streamers 2 and 3 with the workboat. Record a TS Dip prior to start of acquisition after cable ballasting on 3rd November.

6th November - streamer 3 failed on line 1196, infill due to solid extraction errors - stop production and complete repairs - cleaned all plugs and connectors. Replaced programme plug and 2 modules. Streamer was re-powered but random extraction were still reported - this streamer is being constantly monitored.

Acquisition progressed well through the week but continuing intermittent problems with extraction errors on streamer 4 were reported. These improved as the sea and swell decreased further towards the end of the week.

Array performance has been good with good volume, pressure and timing being maintained on all lines.

The SEMAC started moving from her Port Campbell location on Sunday 7th November but this has not been the cause of any extended line changes, interference or lost acquisition. Good communications have been maintained on all line passes in the vicinity of this vessel.

No accidents or lost time injuries reported. No spillage of oil overboard or loss of containment. One near miss reported where lithium batteries were found corroded on the back deck. They were cleaned and correctly stored. The crew have been reminded of the correct procedures for the handling and storing of this type of battery. Item - closed.

Whale watches have been maintained and soft-start procedures for source arrays applied in all cases as required.

Work boat launches for cable maintenance, ballasting and TS Dips were performed during the week. Toolbox meetings carried out prior to each boat launch.

Health, safety and environment (HSE) training sessions were conducted daily this week for the crew under the direction of a qualified PGS HSE adviser. They covered all aspects of HSE management including permit to work/ lockout systems and personnel safety. The sessions were attended by PGS seismic and marine crew plus client representatives.

November 7th at 01:00 hours contacted fishing vessel FARMOR and requested she keep well clear of our operations - not a particularly co-operative response from the Captain. Shall follow up with the PERFECT LADY if he is still in the area over the next 24 hours. No lost time.

A backlog of STOP cards and hazard reports was received and forwarded to Woodside for evaluation and action if required. Onboard reporting has been very good.

Week 5 (10th Nov - 11th Nov)

Sail-line km: 98.250

CMP: 786.00

Continue acquisition of final prime, infill and reshoots in fair weather and sea conditions. Cable balance and control acceptable in side sea and swell conditions.

Released the PERFECT LADY at 18:00 hours local time to return to Portland to rig up for a shallow water bathymetric survey for Santos.

The fishing vessel FORMOR was again reported - this time he had layed sharks along the line direction of the southernmost lines of the survey area. He was contacted via VHF and again the crew were far from receptive or co-operative when requested to give us clearance to pass later in the morning.. The vessel had shot her nets and would remain on her location till 08:00 hours on 11th October.

At 08:45 hours commenced to circle at the start of line. The line was then completed with no further interruptions.

The last shot of the survey was recorded at 16:57 hours on 11th November. The crew then proceeded to recover 3 streamers which was classified as demobilisation as the vessel was continuing immediately on to another survey for Santos.

Demobilisation time was logged as, 12th November, 2003.

No accidents or lost time injuries reported. No spillage of oil overboard or loss of containment.

2.4 CONTRACTORS

PGS Asia Pacific Pte Ltd

PGS was the acquisition contractor. They provided the seismic survey vessel M/V ORIENT EXPLORER, together with all the geophysical exploration equipment and personnel necessary to complete the survey. A marine party chief was onboard the vessel to co-ordinate the seismic operations and to liaise with the onboard client representative. Shore-based managers and supervisors were provided for logistic support and organisation at the PGS Singapore. They provided any technical back-up and support when required.

PGS Asia Pacific Pte Ltd
Thong Teck Building
15 Scotts Road
Singapore

Contact: Mr Johnny Leknes

Exploration Consultants Australia Pty Ltd (ECL)

ECL, Australia was contracted to supply the full-time services of an experienced consultant to oversee all seismic acquisition on behalf of Woodside. The consultant reported on a daily basis, or as appropriate directly to Woodside in Perth, Western Australia on all aspects of the seismic operation.

Exploration Consultants Australia Pty Ltd
610, Murray Street
West Perth WA 6005
Australia

Contact: Mr John Stanton

2.5 SIGNIFICANT DATES

17 th October, 2003	M/V ORIENT EXPLORER arrives in Portland, Victoria at 11:00 hours local time.
17 th October, 2003	Woodside conduct HSE orientation and vessel and heli-deck audit.
18 th October, 2003	Woodside complete audit procedures.
19 th October, 2003	M/V ORIENT EXPLORER departs Portland at 12:00 hours local time.
19 th October, 2003	Commence streamer deployment in marginal conditions.
20 th October, 2003	Abandon streamer deployment due to rough weather.
21 st October, 2003	Return to Portland and standby till conditions in the survey are forecast to improve.
22 nd October, 2003	Depart Portland, run tow test and recommence with streamer deployment.
23 rd October, 2003	Carry out aerial survey of the Antares area – no cetacean sightings.
24 th October, 2003	Complete deployment of streamers.
25 th October, 2003	Commence acquisition.
28 th October, 2003	Interrupt acquisition for a scheduled crew change in Portland. All equipment recovered.
29 th October, 2003	In Portland for PSG crew change
01 st November, 2003	Continue acquisition.

11 th November, 2003	Complete acquisition.
12 th November	Complete demobilisation.

2.6 ACQUISITION PARAMETERS

2.6.1 General Information

Client	Woodside Energy Limited
Contractor	PGS
Vessel	M/V ORIENT EXPLORER
Survey Name	Antares 3D marine seismic survey
Type of Survey	3D seismic
Mode of Shooting	4 streamers / dual source / flip-flop

2.6.2 Survey

Total Proposed Full-Fold Area	210.241
Total Full-Fold CDP Kilometres	8,409.6 from pre-plot co-ordinates
Full-Fold Sail Line Kilometres	1,051.2 from pre-plot line co-ordinates
Number of Sail Lines	33
Geographical Sail Line Orientation	125° / 305°

2.6.3 Recording

Recording Instruments	Syntrak – 960-24
Recording System	Syntrak – 960 - 24
Dual Recording	Yes
Recording Media	Imation and Emtec 3590 cartridges/ASCII/TAR
Recording Format	SEG-D 8058
Record Length	6.0 s
Sample Rate	2 ms
Low Cut Filter/Slope	3 Hz at 12dB/Oct (out)
High Cut Filter/Slope	206 Hz at 276 dB/Oct
Seismic Channels	1,296 (324 per streamer)
Dual Recording/Tape Copy	No – tape copies produced off-line

2.6.4 Streamer

Streamer Type	Syntrak digital telemetric streamer
Number of Streamers	4
Active Streamer Length	4050 m/streamer
Active Groups	324 per streamer total 1296 groups
Group Interval	12.5 m
Group Length	16.12 m (12 phones/group)
Hydrophone	Teledyne T2
Hydrophone Sensitivity	20V/Bar at 10 Hz (rated)
Hydrophone Sensitivity	20.8 to 21.7 V/bar tested
Towing Depth	7.5 m ± 1.0 m
Streamer Separation	100 m between each streamer
Total Streamer Spread	300 m lateral spread (streamer 1 to 4)
Cable-Levellers	17 Digicourse depth controllers/streamer (extra

	compass at head and tail-end) Digicourse 5011.
--	--

2.6.5 Energy Source

Energy Source	Bolt airguns
Operating Pressure	1,800 psi
Volume	2,500 cu.in per energy source
Number of Sub Array Strings	3 per energy source
Synchronisation Tolerance	±1 ms (90% within 1 ms 10% within 1.5 ms)
Source Depth	6 m ± 0.5 m
Energy Source Separation	50 m (centre-to-centre)
Source Array Length	14 m
Source Array Width	10 m
Compressors	4
Near Field Recording	Yes

2.6.6 Navigation and Positioning

Primary Navigation	StarFix Spot dGPS	SkyFix Spot dGPS
RTCM Delivery System	Optus Sport	Optus Spot, Inmarsat POR
Reference Stations	Melbourne 220 km	Melbourne 200 km
	Adelaide 550 km	Adelaide 520 km
	Cobar 840 km	Sydney 920 km
	Bathurst 850 km	Brisbane 1,570 km
Contractor	Fugro-Survey AS	Thales GeoSolutions

2.6.7 Geodetic Information

The following parameters were used for all positioning data, survey coordinates.

2.6.7.1 Datums

Survey Datum	GDA94
Ellipsoid	GRS80
Semi-Major Axis	6378137 m
I/Flattening	298.257222101
GPS Datum	WGS84
Ellipsoid	WGS84
Semi-Major Axis	6378137 m
I/Flattening	298.257223563
Geod Height	-1.6 m (EG96) (Woodside reccom.)
	(min. -1.90 m, max. -1.45 m)

2.6.7.2 Datum Shift/Transformation

From WGS 84 to GDA94	
EPSG Transformation Code No:	1150
DX (m)	0
DY (m)	0
DZ (m)	0
Magnetic Variation	10.9° recommended

***Note:-** GDA94 is a realisation of WGS84 coincident to within 1.5 m.
This transformation has an accuracy equal to the coincidence figure.

2.6.7.3 Map Projection

Projection	MGA Zone 54
Projection System	Transverse Mercator
Central Meridian	141° east/ zone 54
Scale Factor on Central Meridian	0.9996
Latitude of Origin	0° south
False Easting	10,000,000 m
False Northing	500,000 m

2.6.7.4 Block Boundary

Northing (Metres)	Easting (Metres)
635788.17	5734696.87
639655.90	5740044.83
667520.90	5719892.46
665226.28	5716719.65
652701.69	5722464.78

2.6.7.5 3D Grid Specifications

Number of Sail-Lines	33
Number of Sub-Surface Lines	264
Sub-Surface Lines per Sail-Line	8
Sub-Surface Line Separation	25 m
3D Bin Length	18.75 m (acquisition), 6.25 m (processing)
3D Grid Orientation	125.87°/305.87°
Offset Point of Origin (1,1)	637810.13 E 5742613.35 N/S
In-line Cell Length	6.25 m
Cross-Line Cell Width	25 m
CMP Separation	25 m
Shot Interval	18.75 m
Spread is	Symmetrical about the sail-line
CMP Increment	1
Shot Increment	1
Area Size	209 sq km (scale factor not applied) (calculated)

2.6.8 3D Binning System and Offsets

2.6.8.1 Online Binning System

System	Census
Software Version	4.1.1
Computer	IBM Risc 6000
Tape Storage	Exabyte
External Disks	Yes
Printer	Tektronix colour plotter

The Census system operating with software Version 4.1.1 used the following set-up for the survey area. (It was oriented so that the display of the area was with the lines displayed in the vertical orientation.)

*These parameters refer only to *Navigation* binning...

Grid Orientation	305.87°	125.87°
Bin Interval	X = 6.25	Y = 25.0 m

Number of Segments	4
Discreet Offset Step Size (Uniqueness)	75.1 m
Near Offset	125 m (nominal)

Flexible Binning

Bin expansion or flexible binning was approved and only applied to assess areas where infill may be required to improve loss of coverage, caused by on line control, steering, current or tidal shifts.

Near Groups	Nil
Near Mids	50% (bin width = 50 m)
Far Mids	50% (bin width = 50 m)
Fars	100% (bin width = 75 m)

Nominal Streamer Offsets	Offsets (Metres)	Fold Coverage	Total/Required
1 Nears (Channels 1-81)	0000-1012	90%	13 - 12
2 Near Mids (Channels 82-163)	1013-2025	80%	13 - 10
3 Far Mids (Channels 164-245)	2026-3037	70%	14 - 10
4 Fars Channels (246-327)	3038-4050	60%	14 - 08

Binning System Offsets	Offsets (Metres)	Flex Allowed	Total/Required
1 Nears (Channels 1-81)	299-1443	0%	13 -12
2 Near Mids (Channels 82-163)	1443 - 2586	50%	13 -10
3 Far Mids (Channels 164-245)	2586 - 3730	50%	14 -10
4 Fars Channels (246-327)	3730 - 4948	100%	14 -08

2.7 MODIFICATIONS TO SPECIFICATIONS

25 th October, 2003	Log array timing errors from 1.0 to 1.5 milliseconds. Errors above 1.5 milliseconds to be logged as misfires, (bad shots) for later editing.
26 th October, 2003	Approve delay in recording of near-field tests to get production underway in fair weather. Agreed that tests had to be completed prior to the scheduled crew change on 29 th October.
1 st November 2003	Run streamers at 8 metres to reduce swell noise interference.

3.0 PRODUCTION AND TIMING DETAILS

3.1 PRODUCTION BREAKDOWN

Line Type Analysis

	Period	(%)	Survey	(%)
Prime	1,124.08125	87	1,124.08125	87
Infill	164.60625	13	164.60625	13
Infill (% of Prime)	15	-	15	-
Total :	1,288.68750	100	1,288.68750	100

Line Charge Analysis

Sailed Kilometres

	Period	(%)	Survey	(%)
Prime	1,131.75000	86	1,131.75000	86
Infill	166.35000	13	166.35000	13
Infill (% of Prime)	15	-	15	-
N/C Reshoot	14.58750	1	14.58750	1
Total :	1,312.68750	100	1,312.68750	100

Charged Sailed Kilometres

	Period	(%)	Survey	(%)
Prime	1,124.08125	87	1,124.08125	87
Infill	164.60625	13	164.60625	13
Infill (% of Prime)	15	-	15	-
Total :	1,288.68750	100	1,288.68750	100

CMP Kilometres

	Period	(%)	Survey	(%)
Prime	8,992.65000	87	8,992.65000	87
Infill	1,316.85000	13	1,316.85000	13
Infill (% of Prime)	15	-	15	-
Total :	10,309.50000	100	10,309.50000	100

Square Kilometres

	Period	(%)	Survey	(%)
Prime	224.81625	87	224.81625	87
Infill	32.92125	13	32.92125	13
Infill (% of Prime)	15	-	15	-
Total :	257.73750	100	257.73750	100

Fullfold Sailed Kilometres

	Period	(%)	Survey	(%)
Prime	1,057.25625	87	1,057.25625	87
Infill	154.48125	13	154.48125	13
Infill (% of Prime)	15	-	15	-
Total :	1,211.73750	100	1,211.73750	100

Full-fold CMP Kilometres

	Period	(%)	Survey	(%)
Prime	8,458.05000	87	8,458.05000	87
Infill	1,236.45000	13	1,236.45000	13
Infill (% of Prime)	15	-	15	-

Total : 9,694.50000 100 9,694.50000 100

Full-fold Square Kilometres

	Period	(%)	Survey	(%)
Prime	211.45125	87	211.45125	87
Infill	30.91125	13	30.91125	13
Infill (% of Prime)	15	-	15	-
Total :	242.36250	100	242.36250	100

3.2 TIME BREAKDOWN ANALYSIS

Time Activity Analysis

	Period	(%)	Survey	(%)
Recording	145.467	23	145.467	23
Line Change	70.500	11	70.500	11
Extended Line Charge	1.900	0	1.900	0
Weather	65.733	11	65.733	11
Fishing Activity	2.250	0	2.250	0
Instrument	15.750	3	15.750	3
Source	7.950	1	7.950	1
Streamer	48.983	8	48.983	8
Ship	0.500	0	0.500	0
Travel To/From Port	4.250	1	4.250	1
Port/Crew Change	71.917	12	71.917	12
Contractor	3.000	0	3.000	0
Mobilisation	136.000	22	136.000	22
Demobilisation	19.383	3	19.383	3
Infill Line Charge	10.500	2	10.500	2
Infill	20.917	3	20.917	3
Total :	625.000	100	625.000	100

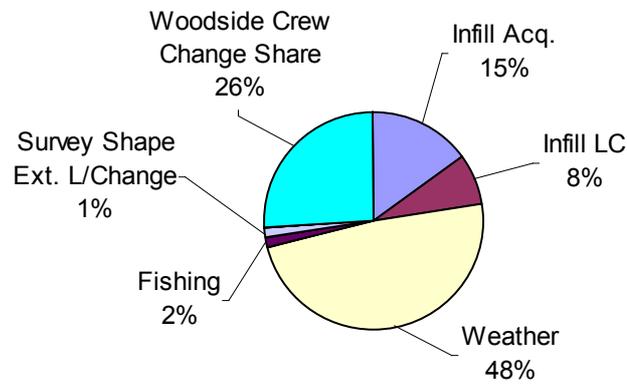
Time Cause/Reason Analysis

	Period	(%)	Survey	(%)
Production	215.967	35	215.967	35
Infill	31.417	5	31.417	5
Weather	65.733	11	65.733	11
Equipment Failure	73.183	12	73.183	12
Mobilisation/Demobilisation	159.633	26	159.633	26
Woodside Requirements	35.950	6	35.950	6
Crew Change	35.967	6	35.967	6
PGS	3.000	0	3.000	0
Fishing Interference	2.250	0	2.250	0
Survey Shape	1.900	0	1.900	0
Total :	625.000	100	625.000	100

Time Charge Analysis

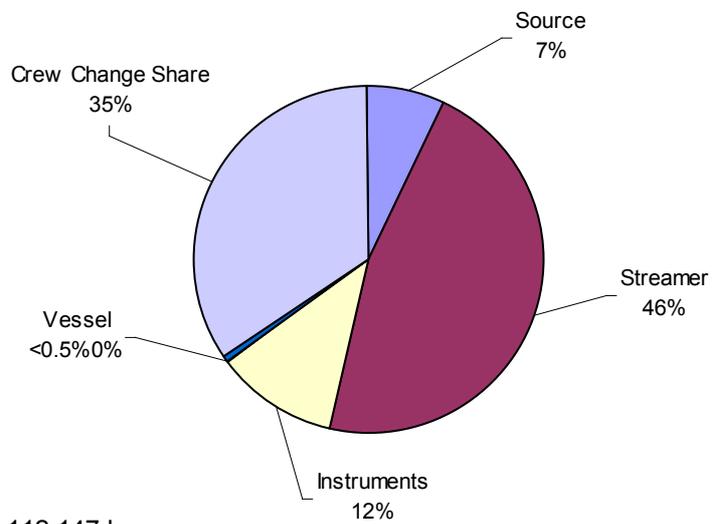
	Period	(%)	Survey	(%)
Prime	145.467	23	145.467	23
Operations	70.500	11	70.500	11
Standby	105.833	17	105.833	17
Contractor	112.150	18	112.150	18
Mobilisation/Demobilisation	159.633	26	159.633	26
Infill/Standby	31.417	5	31.417	5
Total :	625.000	100	625.000	100

Woodside Standby Time Analysis



Total Woodside Standby Charge = 137.24

PGS Downtime Analysis



Total PGS Downtime = 112.147 hours

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL

4.1.1 Conclusions

Good production and performance were achieved throughout the duration of the survey with some weather standby and nominal lost contractor downtime being incurred. Weather downtime was a large contributor to lost production as was a scheduled crew change and resupply part-way through the survey. In all 5 days of production in a good weather period was lost during this port call.

The recording system as a whole was a cause of some concern as a number of line portions had to be reshot due to a combination of tape unit reading problems and the online 'locking-up' of the Syntrak recording system. Tapes were played back on various decks to ensure the data that was recorded was good, readable, recoverable and was not affected by the displayed system faults. Up to the time of the completion of the survey there still had been no fix for the problems (they were still present).

There were problems with extraction errors associated with streamers 3 and 4, which were very intermittent. The cause of the errors was probably a very small amount of moisture in a connector. At the time of completion, the problem still had not been resolved. A number of sections, modules and programme plugs had been replaced trying to locate the source of the fault causing the errors. The outcome of the extraction errors was the need for additional time necessary for trace testing and editing by the onboard processing personnel.

Streamer balance and depth control was fair although time was lost after the October crew change making major ballast adjustments to streamer 4. At times depth control was compromised due to swell and sea conditions which were outside the control of the contractor. The depth control prior to the crew change had been acceptable.

There was no requirement for full onboard processing of the data by Woodside. Quality control data processing was available up to brute stack status and a common offset cube was also produced. A Cobra package and Promax were the only systems available for the assessment of swell noise. Brute stacks on all lines were produced and a common offset cube with time slice cross-line displays were also available.

Velocities were supplied by Woodside and additional picking by PGS was done on every other sail-line on a 2 kilometre interval as required.

The weather for the majority of the period was fair with moderate seas and swells approaching 2 metres for most of the period. Wind and swell was predominantly from the south-west although there were a number of days with wind directions coming from all points on the compass. Considerable weather standby was incurred in late October and early November. A long onshore swell was present for the start of acquisition right through to the end of the survey making conditions on the vessel difficult for any prolonged length of time due to lack of sleep by the crew.

After consultation with Woodside marginally higher than normal levels of swell noise were accepted at times. General data quality overall was good, with only marginal swell noise interference being observed on a small number of the lines acquired during high swell conditions.

Array performance was of an acceptable standard with good pressure, volume and timing control being maintained on all lines once acquisition was underway. Only minimal shot edits were required due to gun timing exceeding the allowed 1.5 milliseconds.

Initial gun problems were experienced and this is not unusual after a 4 week transit with the arrays stowed and sealed on deck. Once settled in, array performance was quite stable.

Navigation, positioning and control was acceptable. Tailbuoy performance throughout was very good with all 4 tailbuoys operating for the majority of the survey.

Tailbuoy feather throughout the survey remained low with a maximum of 3 degrees being observed.

No whales were reported although whale watches were maintained throughout. An aerial survey of the area was conducted prior to starting acquisition as per Woodside and Governmental regulations.

Only 30 minutes of vessel downtime was logged due to fuel priming and transfer problems prior departing Portland after the first crew change on 29th October.

Health, safety and environment was well managed with regular drills, safety meetings, weekly training sessions, regular equipment maintenance and checks being performed. No lost time accidents were reported.

One near miss was reported where Lithium batteries were found un-secured on the back deck.

There was one medical incident (non-work-related) where a crew member on the PERFECT LADY fainted while on shift. He was immediately taken ashore for medical treatment and consultations, arriving back at work some 5 days later with a clear bill of health and no apparent reason for the fainting.

No vessel refuelling was done at sea. This was carried out in conjunction with a scheduled crew change in Portland on 17th October.

All crew and personnel were professional in their work attitudes and performance and morale was good.

4.1.2 Recommendations

- On a vessel of this type and with the proximity to port, refuelling should be scheduled during crew changes.
- Set up contingency plan where the vessel could leave the survey area during a period of poor weather to bunker, resupply and crew change if necessary.
- Stagger crew changes so the entire crew do not depart the vessel on the same day.
- Consider crew change by helicopter to reduce recovery/ transit time. (Weather permitting)
- Technical support should be requested to address the Syntrak 'lock-up' problems.
- Technical support should be made available to address the tape error problems.

4.2 RECORDING SYSTEM

4.2.1 Conclusions

- The Syntrak recording system performance was acceptable although problems were reported with non-scheduled system lock-ups on line.
- On the first line attempted incorrect baud rate settings had been input to the system causing loss of data and an eventual reshoot.
- Tape deck problems were also reported and the cause of some data reshoots.
- Recording system daily and monthly test procedures were acceptable and recorded on a regular basis.
- A full set of SIEP technical tests was recorded on the vessel prior to commencement,
- Near field hydrophone tests were recorded during acquisition as were additional monthly tests and streamer noise tests as requested.
- Recorded tests were delivered to Woodside for shipping to SIEP for analysis.
- Daily tests were recorded as required and following any streamer repairs.
- There were instances of the system 'locking-up' on line causing lost production time and reshoots.

4.2.2 Recommendations

- Keep vessel speed down to allow for sufficient lead time and clearing of buffers from earlier shots to reduce the risk of further locking-up on line.
- Technical support should be made available to address the Syntrak and tape deck problems.
- Near-field phone tests should be recorded prior to the vessel starting acquisition, possibly during transit to the survey area.
- Ensure and check all correct system settings have been input prior to the start of any line.

4.3 STREAMER SYSTEM

4.3.1 Conclusions

- The 4 streamers performed well during the survey, with reliable hydrophone and electronic characteristics.
- Balance was acceptable for the first swing but following the crew change additional ballast changes were made and the depth control on streamer 4 was severely affected.
- Considerable lost production time occurred during the additional ballast changes required to correct streamer depth operations.
- Occasional depth controller/compass outages did occur, but these were dealt with quickly, and are considered part of the normal acquisition process.
- The lead-in on streamer 4 required replacement when power could not be restored to the streamer after ballasting operations on 3rd November.
- Electrical and telemetry problems with streamer modules, stretch sections occurred and were the cause of lost production time.
- In some instances, depth controller, compass, section and module changes during regular line changes could be made with the dedicated work boat, dependant on weather and sea conditions.

4.3.2 Recommendations

- It is recommended that additional time and care be taken during streamer ballasting.
- More detailed notes during hand-over should be available and more time at crew changes should be available to save problems such as those experienced with the ballasting of streamer 4.
- Ensure all separation ropes are clearly labelled and marked for the on-coming crew to assist with streamer positioning and deployment.
- Ensure the maintenance and upkeep on work boats is maintained as in-water streamer repairs can save considerable cost to all parties.
- Inspect all ropes and chains at regular intervals for signs of wear.
- Investigate the possibility of using 'solid' streamers to reduce levels of swell interference and the possibility of oil spills due to streamer damage.

4.4 SOURCE SYSTEM

4.4.1 Conclusions

- Array performance was acceptable throughout.
- Edits due to misfires, auto-fires etc were minimal. The array was able to operate easily inside the agreed contractual array drop-out specifications.
- Random 'false' auto-fires were reported on at least two occasions through the gun-control system.
- The robust design of the source arrays, the reliability of the Bolt guns, combined with the ease of handling and a good maintenance schedule meant that the guns performed well during the survey.
- Stable air pressure and volume was available to the array for the duration.

4.4.2 Recommendations

- Check the gun-controller for circuitry problems which result in ‘false’ auto-fires being logged and displayed. Outside technical support may be required.
- Ensure all available compressors are operational at the start of any survey.
- Ensure adequate major spares are available on the vessel to save lost production time.
- Ensure and check all correct system settings have been input prior to the start of any line.

4.5 SEISMIC QUALITY CONTROL PROCESSING SYSTEM

4.5.1 Conclusions

- The Cobra quality control system was available for the real-time quality control of the seismic data.
- The RMS noise displays were a great asset for on-line quality control and noise determination.
- Brute stacks were produced for each line sequence.
- There were 2 quality controllers available working 12 hour shifts.
- All data was forwarded to Woodside upon completion as per instructions.

4.5.2 Recommendations

- Ensure the Cobra and Promax quality control is available at all times as a minimum requirement.
- Processing systems with SWAT or a similar swell noise reduction filter capabilities be made available to assess swell noise interference.

4.6 NAVIGATION SYSTEM

4.6.1 Conclusions

- All navigation systems performed satisfactorily throughout.
- System stability throughout was good.
- All peripheral systems, acoustics, compasses, head and tailbuoys also performed satisfactorily.
- The SPECTRA navigation system, in combination with the Robtrak steering system and on-line binning system, proved to be a reliable and flexible system.

4.6.2 Recommendations

- Investigate the possibility of using Internet available velocity data when it is not possible to record TS or Sippican data due to sea conditions.
- The web site to obtain velocity data is: <https://128.160.23.42/gdemv/gdemv.html>

4.7 NAVIGATION PROCESSING SYSTEM

4.7.1 Conclusions

- The navigation processing system performed well during the survey, with the lines fully processed to final P1 format.
- The P1 filtered navigation data that was merged with the seismic data was in metres.
- P2/94 navigation data is in raw format – i.e. is in metres.
- No raw GPS data was recorded on the P2 tape.

- P2 comparisons were FTPd ashore for additional quality control analysis by EDR Hydrosearch.
- Results received from EDR indicated the system and set-up was satisfactory and acceptable.
- No independent navigation quality control system software was available during the survey.

4.7.2 Recommendations

- Use external navigation quality control source for confirmation of P1 and P2 survey data and any other questionable navigation data.
- Employ the use of an independent navigation quality control system on vessels during all surveys.

4.8 3D BINNING AND INFILL

4.8.1 Conclusions

- The SPECTRA system, combined with careful selection of lines, and variable feathers, produced fair overall results, although the final infill percentage rate of 14.64 percent was slightly lower than first estimated.
- Coverage plots to assess infill requirements were made with an expansion or flex allowance commencing at 50 percent at the near-mid groups, (2s) to 100 percent at the far groups, (4s) as per instructions from Woodside.
- GIF files were readily made available for transmitting via e-mail.
- Two binning databases were built from the start of the survey to display either flexed or un-flexed coverage.
- Flexed coverage was only used for infill determination and not used for any on-line steering or control

4.8.2 Recommendations

- No recommendations at this time.

4.9 SURVEY VESSEL AND CREW

4.9.1 Conclusions

- The performance of the M/V ORIENT EXPLORER was acceptable.
- The vessel did not refuel offshore.
- All bunkers and supplies taken on alongside the main wharf in Portland.
- The e-mail and telephone operated well throughout.
- The vessel proved to be an acceptable working platform for acquisition of seismic data.
- The design and layout of the accommodation, offices, and seismic facilities was adequate.
- Work places were clean, and air-conditioned.
- Lighting in the recording room was acceptable.
- The marine crew performed well in their tasks of maintenance and operation of vessel marine facilities.
- Storage space was limited and very congested particularly in the engine room department.
- Spares stores required cleaning and repacking.
- Large stores of chemicals were onboard and required segregation and repacking.
- General housekeeping on the marine side of operations required improvement.
- Signage from Russian to English required significant improvement.
- The management of health, safety and environment and the associated reporting was fair.
- Co-operation between the crews and departments was acceptable.

- The seismic crew was usually very helpful, and displayed both experience and professionalism in their duties.
- The galley was clean and mopped and secured after each meal.
- The supply, quality and quantity of food onboard was of a high standard. Food after meals was covered and stored, with dishes and cutlery also being washed, dried and stowed.
- There was no sign of cockroach infestation but traps and baits were laid strategically throughout, indicating it may have been an earlier problem.
- There was no sign of rodent infestation.

4.9.2 Recommendations

- Ensure general housekeeping standards are improved by regular inspections.
- Improve the storage and management of chemicals, particularly in the engine room department.

4.10 HEALTH, SAFETY AND ENVIRONMENT

4.10.1 Health

4.10.1.1 Conclusions

- Hygiene levels around the vessel were considered to be acceptable.
- Cooks and food handlers were not supplied with hats and did not use head covering throughout.
- Appearance of the cooks was clean and tidy. Uniforms were not supplied.
- Woodside and PGS both have a current Alcohol and Drug Policy in force and it was displayed at various locations throughout the vessel.
- Drug and alcohol testing was not carried out on personnel during the survey.
- Smoking was permitted only in designated smoking areas outside of the accommodation.
- All crew held current medical certificates.
- There was a full time medic on the vessel.
- There was a gymnasium available for those wishing to use it after shift.
- Cabins were cleaned daily, with bedding changed and washed weekly by stewards.

4.10.1.2 Recommendations

- Ensure vaccinations for all crew are maintained.
- Ensure current medical certification is maintained.
- Make attempts to help the onboard personnel 'quit' smoking, either by incentive or HSE presentations.

4.10.2 Safety

4.10.2.1 Conclusions

- A combined Woodside, PGS health, safety and environment induction was conducted for all personnel prior to sailing from Portland.
- A second induction was presented in Portland during the October crew change.
- A STOP card system is in place, and all crew contributed.
- The crew were given Woodside Stepback 5 x 5 Information and Cards, with an explanation of the system and its merits.
- A permit to work system was in place and correctly implemented throughout. Additional instruction on this system was given during the survey by a PGS HSE adviser.

- The presentation of both STOP card and risk identification reports (RIRs) was carried out during general safety meetings.
- The CSRs were given complete access to the PGS safety database.
- Not all crew held current HUET certification.
- All crew held current Basic Sea Survival Certificates as a minimum standard.
- The vessel does not have a dedicated safety focal point, although on the second ‘swing’ a dedicated HSE adviser joined the vessel for training purposes. This position is normally shared by the Captain, chief officer and party chief.
- A full time medic was available.
- Toolbox meetings were regularly conducted before all small boat launches and prior to any extraordinary work being performed.
- Departmental handovers at shift change were well conducted and considered to be adequate.
- Crew handovers on crew change were considered barely adequate and additional time would definitely be a bonus to all.
- Handover notes from department heads were made available to their relief by e-mail prior to joining the vessel.
- The use and application of personal protective equipment was found to be of a generally high standard.
- Small boat operations and launchings were of a very high standard.
- The final decision on any work boat launches was made by the Captain.
- Safety meetings were conducted as required, with all non-essential crew being in attendance.
- Minutes of all drills and meetings were made readily available to the CSR onboard and forwarded to Woodside as required.
- Additional on-the-job training was also given during the course of the survey.
- A full HSE audit of the vessel and the helideck was performed during the initial port call in Portland at the start of operations.
- The crew response to the audit and addressing of action points was acceptable.
- Safety and HSE management training was conducted by a PGS HSE adviser who joined the vessel at the Portland crew change.

4.10.2.2 Recommendations

- All persons joining the vessel should have current medical, HUET and sea survival certification as a minimum requirement.
- It is recommended that the position of medic be maintained for all surveys in remote and semi-remote regions.
- Continue with HSE management training.
- Try to more fully involve the Russian crew with HSE and other safety matters on the vessel.

4.10.3 Environment

4.10.3.1 Conclusions

- There were no hazards or detriment to the environment reported or witnessed during the survey.
- There were no oil spills or loss of containment reported due to contractor fault or failure.
- There was no rubbish or garbage disposed of overboard.
- No raw or untreated sewage was disposed of overboard at any time.
- Segregation of rubbish, tins, and glass was practised onboard.
- No food scraps were disposed of overboard.

- Any non-burnable waste was retained onboard until the first opportunity to offload at a designated port or via a supply vessel.
- Waste logs were maintained by the marine and engineering departments.
- A diligent watch and log was maintained on the Bridge for whales, dolphins, turtles, etc. on a 24 hour basis.
- Night vision binoculars were available to assist with whale watching.
- Soft start procedures for the gun arrays were in place and were applied on all lines.
- An aerial survey of the Antares block was carried within 24 hours of firing any source arrays on 24th November.
- A final aerial survey of the area was carried out on 31st Oct – again no cetaceans were sighted.
- A visual inspection of the survey area was also carried out 24 hours prior to the firing of any source arrays.
- The vessel only anchored in Portland Bay during a period of weather standby during mobilisation in October.

4.10.3.2 Recommendations

- Maintain the high standards already in place.
- No other recommendations at this time.

5.0 QUALITY CONTROL

5.1 GENERAL

5.1.1 Observations

- Quality control checks and procedures on all data acquired were adequate and acceptable.
- Numerous online checks and displays were available for the observers during acquisition.
- Line logs and hard-copy printouts were available at the end of line for further interpretation.
- The Cobra quality control system and Promax were used throughout for the processing of the acquired seismic data to brute stack status plus the building of a common offset cube. The system operated on a 24 hour basis with only two operators working 12 hours shifts.
- For online quality control, the same system was used for confirmation of bad traces, noisy data traces, etc. If any misfires or edits were logged the operator would check and confirm all data and traces edits, shotpoint numbers and file numbers on the final data set.

Overall the performance of all systems was acceptable. The majority of problems reported on line, stemmed from failure of streamer electronic modules, noisy traces, loss of power, Sytrak lock-up, tape errors and a lead-in failure

The most complex problem experienced was the acceptance criteria of data which was affected by moderate to strong bursts of swell noise during periods of marginal weather. As no onboard processing was available it was up to the discretion of the onboard quality controller to determine cut-off levels. This was done with a review of the brute stacks and consultation with the OBP personnel. Only a few lines were affected by swell noise and it was not considered serious enough to reject and list for reshooting.

The maximum noise reported was 11 to 13 microbars after the application of a 6 Hertz low cut filter. As the data observed was basically raw with little or no processing it was considered acceptable.

To reduce or eliminate the risk factor outlined above the author would strongly suggest that a swell noise attenuation programme or filter such as SWAT be made available and applied during future surveys. This would:

- Allow for absolute maximum amount of acquisition prior to shutting down for weather.
- Reduce the risk of shutting down for weather when additional acquisition may have been possible.
- Reduce the risk of having to re-acquire data which may display higher than approved levels of swell noise.

5.1.2 Data Edits

A comprehensive listing of all proposed data edits was maintained by the OBP personnel on the vessel. The list was to be included in electronic format as requested by Woodside with the final data shipment and deliverables.

The edit list contained, but was not only restricted to edits, for the following factors:

- Array misfires
- Array autofires
- Loss of air pressure/volume
- Depth control edits
- Swell noise
- Seismic interference
- Ship noise
- Bad channels and traces
- Earth leakage
- Spiking and noisy channel/traces

- Loss of navigation or positioning systems

5.1.3 SIEP Start-up and Instrument Tests

Full recording system instrumentation tests had been performed as per SIEP requirements. The suite of tests were forwarded to Woodside for onward shipping to SIEP for final analysis.

There were no streamer sensitivity tests recorded.

Near-field hydrophone tests were not recorded at this time but were recorded prior to commencing acquisition as per instructions from SIEP.

Additional monthly instrument and streamer tests were recorded as required also prior to the start of acquisition, and, as with the near-field tests, were sent from the vessel at the first opportunity.

Throughout the survey normal daily, and monthly tests were recorded as required and no major ambiguities were detected.

A final set of monthly tests was recorded on completion of the survey.

5.2 RECORDING SYSTEM

5.2.1 Observations

The recording system on the M/V ORIENT EXPLORER was the Syntrak 960-24 interfaced to 4 Syntrak digital seismic streamers. Filtering, A/D conversion, and amplification were done in the streamer modules before the signals arrived on the vessel. The onboard part of the instrumentation dealt with the formatting, recording and quality control display of the seismic data. Data storage was on 3590 cassettes, which were copied onboard. Data from all the ancillary equipment, such as guns and depth controllers, was also collected, logged and displayed on board via various monitors and also available in hard copy.

No major technical problems were reported with the system and it was approved to commence the forthcoming survey. Once the survey commenced a number of lines had to have partial reshoots recorded due to the Syntrak 'locking-up' for no apparent reason. The lines in question would be continued while the system was rebooted. Approximately 50 to 60 shots of data were lost in each instance.

No reason for this could be determined but it did appear to be vessel speed related, leaving insufficient time for the buffers to reset after recording the previous shot. Even with reduced speed problems still occurred and even to the end of acquisition no reason for the online halts could be explained.

Tape drive errors also proved to be a problem and data edits were again required due to this. Initially the problem pointed to a bad batch of data tapes but after close investigation it was discovered that this was not the case. It was a hardware problem with the drives themselves.

The vessel should seek technical support to fully test and check the recording system and ancillary systems attached to it to reduce lost time and productivity.

The system has numerous displays for monitoring the quality of the system data. The information on the screens is well laid out, and many functions exist to enhance the quality control effort. The graphical user interface presents most of the information windows in a clear and easily read layout.

Monthly tests were recorded at the start and end of the project, and during the survey period. Daily instrument tests were also carried out which verified the system integrity.

Specific tape labels were required and used throughout. The bar-coded labels were supplied by Woodside and unused labels were returned upon completion of the survey.

5.2.2 Failures and Repairs

- 25th Oct - missed the first 80 shots of the first line 1116 due to incorrect baud rate in the Syntrak recording system. It was rebooted at the start of the line but failed to initialise in time. This line portion was later reshot after further problems with an autofire in the gun arrays.
- 25th Oct – miss SP 1001 –1100 on line 1116 due to Syntrak lockup at start of line – continue and reboot.
- 28th Oct – line 1124 miss SP 2102-2153 due to Syntrak lockup – reboot and continue along line.
- 01st Nov - miss SP 2112-2210 on line 1092 due to Syntrak hang-up on line – continue and reboot system
- 03rd Nov – reshoot on line 1012 - SP 2092-2153 due to a Syntrak lock-up during the original line attempt.
- 03rd Nov – line change after reshoot caused by Syntrak lock-up on sequence 01
- 04th Nov – line 1180 displayed considerable extraction errors which had to be edited from the data.
- 05th No – lost time and the start of line 1188 due to a Syntrak lock-up at the start of line.
- 06th Nov – acquire data reshoot over 2 areas due to earlier Syntrak lock-ups. 0.217 hours
- 07th Nov – missed the start of line due to tape deck problems and Syntrak lock-up. .567 hours.
- 10th Nov – 9.083 hours of downtime was logged due to reshoots of data attributed to by Syntrak lock-ups on line and the line change times associated with these system failures.

Total downtime incurred to instrument and associated systems faults and failure was 15.75 hours.

5.3 STREAMER SYSTEM

5.3.1 Observations

The Syntrak is a digital streamer system with in-water signal processing and digitising. Each active section was 100 metres long with the skin isolated in 12.5 metres sections to allow re-skinning onboard. The basic cable group was made up of 12 hydrophones and measured 16.12 metres. Each streamer consisted of a 50 metre lead-in, head stretch section (75 metres), 45 active sections, 80 electronic modules, tail stretch section (75 metres), tailbuoy rope and tailbuoy unit.

The cables were towed using a standard wide tow set-up, which consisted of buoyed monowing, super-wide wire tows and lead-ins. The monowing were connected to the vessel by wide-tow Spectron ropes. Cable separation was maintained by using Spectron spacer ropes. Each streamer was fitted with 17 depth controller/compass units, all of which were used for streamer depth control and cable shape determination. These depth controllers maintained the cable depth inside specification for most of the time. Special fairing was placed on lead-ins and all tow-ropes to also help reduce the effects of drag and noise turbulence on the total spread.

Any bad channels were detected by the daily and monthly tests, and by examination of the data on the Cobra and Promax quality control systems. The channels were evaluated and documented if deemed to be unacceptable. Some of the channels exhibited problems only occasionally, either falling just out of specification on the system tests or, in the case of weak or noisy channels, not exhibiting the fault at all times. Details of affected lines were noted in the observer reports, and the information was passed to the on board processing personnel.

Streamer balance was good with only isolated deviations from the set levels, usually caused by a faulty depth controller. It was noted that higher noise levels were recorded on sections where compass depth controllers and Sonardyne units were mounted.

Streamer separation was 100 metres and this was quite stable, although currents and water movement did cause some 'trouser-leg' effect or spreading of the inner streamers on the far groups. This was outside the control of the contractor.

5.3.2 Failures and Repairs

- 02nd Nov – line 1092 – edit traces from streamer 4 due to poor cable depth control at the front end. Running up to 12 metres deep. Recover the front of the streamer and adjust ballast. 19.183 hours
- 03rd Nov – continue with ballasting the front end of streamer 4.
- 03rd Nov – replace the lead-in on streamer after it would not power up after reballasting.
- 03rd Nov – deploy work boat on 2 occasions for tail end ballasting and maintenance. 17.267 hours.
- 06th Nov – lost 11.417 hours of production due to extraction errors on streamer 3. Replaced a number of modules, programme plugs.
- 10th Nov – lost 1.117 hours associated with data reshoots and relevant line changes caused by extraction errors in streamers 3 and 4.

Total downtime incurred to streamer system faults and failure was 48.983 hours.

5.4 SOURCE SYSTEM

5.4.1 Observations

The 2,500 cubic inch array was comprised of 2 tuned sub-arrays of different capacities: 1514 cubic inches and 1,549 cubic inches.

The 1514 cubic inch sub-array, was built up of 2 by 2 –gun clusters and 4 single guns; the first 2-gun cluster being made up of 2 by 290 cubic inch guns, the second 2-gun cluster of 2 by 235 cubic inch guns, then the 4 single guns were 1 by 195, 1 by 125, 1 by 90, 1 by 54in³. (8 guns in the sub-array.)

The 1,549 in³ sub-array, was built up of 3 by 2 –gun clusters and 3 single guns; the first 2-gun cluster was made up of 2 by 290 cubic inch guns, the second 2-gun cluster was made up of 2 by 195 cubic inch guns, the third 2-gun cluster was made up of 2 by 155 cubic inch guns, then the 3 single guns are 1 by 125, 1 by 90, 1 by 54 cubic inches. (9 guns in the sub-array.)

The sub-arrays were lined up parallel to each other with a 10.0m crossline separation between them. The overall dimensions of the 3,063 cubic inch array were 15.0 metres long by 10.0 metres wide.

Each sub-array also had 2 depth transducers and 2 hydrophones, one of each at the end of the sub-arrays. Positioning was by a GPS and acoustic networks attached to the centre sub-array of each array. Spacing between the port and starboard arrays was a nominal 60 metres.

Air to the arrays was supplied by compressors located below decks. The supply was maintained sufficiently to operate the 2,500 cubic inch source at 1,800 pounds per square inch firing approximately every 8.0 seconds.

Source array dropout specifications, based on pre-recorded far field signature tests, were provided by Woodside on advice from SIEP. Guns were allowed to be dropped from the full array provided this did not cause a loss of more than 10 percent in amplitude or 10 percent in primary-to-bubble ratio, and that the normalized cross-correlation coefficient was not less than 0.990. In case of a single gun failure in one of the front clusters, acquisition was to halt till repairs were completed. These specifications were adhered to at all times. A copy of the drop-out specifications is included in the Appendix attached to this report.

The GCS-9 gun control system was able to monitor the spread of times between the earliest and latest gun firing and the single gun delays relative to time zero. The gun timing specification required 90 percent of the array to fire within plus or minus 1 millisecond, and the remaining 10 percent within plus or minus 1.5 milliseconds. This allowed any single gun in the array to deviate by 1.5 milliseconds. The timing error threshold was set to 1 millisecond, but when it was only a single gun firing outside this limit it was not logged as a bad shot unless the timing error exceeded 1.5 milliseconds.

5.4.2 Failures and Repairs

- 25th Oct – abort line 1116 due to an auto-fire which could not be terminated on array 1. Circle for repairs. Lost time 1.917 hours.
- 28th Oct – lost 3.283 hours due to a circle for an air leak on array 1.
- 10th Nov – lost 2.75 hours due to a reshoot of data and a line change due to an air leak on an original line sequence

Total downtime due to source array and related system failures was 7.95 hours.

5.5 NAVIGATION SYSTEM

5.5.1 Observations

The system performed navigation data acquisition and validation, shot prediction and header output, real-time source and streamer positioning, steering displays and data monitoring, and flexible integration of navigation, processing, binning and quality control functions.

The navigation control system was TriNav RT 2.6. This system correlated all navigation inputs from the primary system, namely Fugro-Survey AS, StarFix Spot dGPS, using differential corrections sent via Inmarsat, with reference stations located at Melbourne, Adelaide, Cobar, and Bathurst. The secondary navigation system, Thales GeoSolutions, SkyFix SPOT dGPS used reference stations at Melbourne, Adelaide, Sydney, and Brisbane. The systems were prone to occasional minor signal drop-outs, but were generally very stable overall. Both systems were recorded in unison and could be switched immediately in case either one failed.

Tailbuoy positioning was resolved using the Seatrack system. Performance throughout the survey was good, apart from some slight random noise, that was at times evident in the data caused by the differential correction data to the vessel location. No lines or parts of lines were lost to this and data quality was not affected.

Sonardyne acoustic units were placed on the front, middle and tail of each streamer to produce networks of relative ranges between the streamers and the vessel. Minimal dropouts were observed throughout the acoustic network. Data quality and performance was very good.

The compasses used for streamer shaping, were generally reliable, and they were monitored throughout the survey for any noise or bias problems. The performance was considered good, with few failures. There were instances of compasses being changed out, but this was mainly due to depth controller malfunctions or low battery voltages rather than compass problems. Head and tail compasses had back-up units located adjacent to the original location in case of failure, so a good solid head and tail network could be maintained at all times.

The real-time echosounder depth recording velocity was set and remained at 1,500.00 metres per second. The unit was not draft corrected. Water velocity corrections and draft corrections were later applied during navigation post-processing. All water depth data was recorded in digital and hard copy as required.

5.5.2 Failures and Repairs

- Refer to the separate navigation report submitted by the EDR representative on the vessel.

5.6 3D BINNING AND INFILL

5.6.1 Observations

The 3D binning system and techniques used throughout the survey were of a high standard, with a final infill percentage of 14.64% being necessary to achieve acceptable coverage over the confines of the survey. Tailbuoy feather, from the start of the survey was low, only 1.0 degree and remained this way for the majority of the survey. The maximum feather observed was 3.2 degrees.

The flex binning criteria allowed by Woodside was an expansion starting at group 2s from 50 metres (12.5 metres either side of the original bin) on the near mid traces to 75 metres (25 metres either side of the original bin) on the far traces. There was no flex allowance applied to the near traces of group 1s of the streamers. All prime and infill lines were acquired without the aid of any flexed or expansion binning. Flexed binning was only applied under strict guidelines to assess infill requirements.

There was no downtime accrued due to the 3D binning and infill systems or techniques.

5.7 SURVEY VESSEL AND CREW

5.7.1 Observations

The M/V ORIENT EXPLORER is capable of multi-streamer, multi-source 3D surveys up to 4 streamers.

The mess and galley area was kept neat and clean by 2 cooks and 2 stewards. Adequate space was provided with enough seating to accommodate day-to-day requirements. Facilities were available to make tea, coffee, and other hot drinks. Snacks were available at any time of the day, and correctly covered leftover food from the evening meal was available outside of normal meal times. In general, the food was acceptable throughout the survey period.

The vessel was kept clean and well maintained. The deck officers and engineers undertook the management of ship's maintenance with assistance from the deck crew, who carried out the necessary regular maintenance duties.

The recording room was adequate in size and reasonably well laid out. The layout catered for navigation equipment, seismic acquisition equipment and seismic quality control facilities. Several other rooms were designated for use as a client office and for onboard processing. There were sufficient other empty spaces and facilities available for the storage of additional stationery and spare seismic equipment as required.

Engine room and chemical storage was restricted and this was highlighted following an audit by Woodside during the initial start-up. Refer to the minutes and audit details included in the Appendix of this report.

The seismic crew was proficient with respect to its work-related functions and expertise was spread fairly evenly across the range of positions. Most members of the crew were willing to oblige and provided as much assistance as possible to the client representative when requested. The survey was carried out in a professional and diligent manner.

5.7.2 Failures and Repairs

- 29th October – delayed departure by 30 minutes due to problems priming fuel pumps following the crew change in Portland

Total downtime incurred due to vessel problems or mechanical failure was 0.50 hours.

5.8 HEALTH, SAFETY AND ENVIRONMENT

5.8.1 Health

All areas of the vessel, including accommodation, corridors, eating, and food preparation areas were well maintained. Corridors were swept and mopped daily while the eating areas were cleaned after meals. Food preparation and cooking areas were regularly cleaned, with the floors being washed and scrubbed daily, usually in the evening. Fresh fruit and vegetables were kept in a separate chill room, which was adjacent to the walk-in deep freezer. Both chill and freezer rooms were inspected periodically for neatness to ensure that all supplies were packed and stored adequately.

After meals all utensils were washed and stowed. Any food left out for late night meals or snacks was correctly covered or wrapped in plastic or foil. The freezer was generally clean, tidy, and operated at a temperature of minus 20 degrees Celsius. Fresh water was not a problem as the vessel had its own water maker installed and additional supplies could be taken on when bunkering for fuel, if required. There was no evidence of tarnishing in the taste, and the water was fit for consumption. However, there was considerable discolouration indicating rust in the tanks and these need to be inspected.

There were no water tests performed, and there was no water testing kit available on the vessel.

There was a full time medic and very comprehensive hospital available on the vessel.

The medic, captain, party chief and chief steward conducted random inspections covering all food storage, preparation areas, accommodation and work areas in the vessel.

There was no lost time due to other health related incidents and no serious illnesses were reported.

5.8.2 Safety

5.8.2.1 General Observations

Crew attitudes towards safety were acceptable and it was noticed that all crew members (without exception) wore personal protective equipment (PPE) when and where conditions or situations required it. Safety shoes, hard hats, glasses and flotation work vests were worn at all times when working on the back deck areas, although no PPE was needed on the enclosed streamer deck. There was a monthly inspection programme in place for checking the condition of all PPE and department heads were made aware that it was their responsibility to continually monitor its wear of PPE during the daily activities of their department. All safety clothing, including shoes, boots and hats were supplied by PGS.

Sea survival personal protective equipment was checked during scheduled drills.

There was no lost time due to safety related incidents.

5.8.2.2 Drills, Musters and Exercises

Drills, musters and exercises were held on a weekly basis. A safety meeting was held every 2 weeks alternating between a general safety meeting involving the whole crew and a safety committee meeting involving key personnel and heads of departments. All crew held valid safety passports and documentation. Within 24 hours of joining the vessel all new crew members were given a comprehensive safety induction tour and handed a safety/medical questionnaire which they were required to complete and return to the administrator. The induction tour covered most safety aspects of the vessel including a comprehensive run down on the life raft operation and safety equipment carried onboard the life rafts. During the tour all emergency exits were identified and emergency signals and stations explained. A safety sheet was posted on display boards around the vessel outlining each crew member's muster station and designated life raft.

Minutes of drills and meetings were entered into the main vessel log book. At the completion of all drills, a de-brief was conducted for the benefit of all participating personnel.

5.8.2.3 Safety Training

Not all personnel had undergone helicopter underwater escape training. As it eventuated there were no helicopter transfers performed during the survey.

Basic Sea Survival Certification was held by all persons. Additionally fire-fighting courses to varying degrees had been completed. Prior to the arrival of a new crew, the list of on-coming personnel would be received and fire-fighting teams would be organised from the crew list to be in place when the crew arrived onboard. A database of all training was maintained by the Master.

Qualified helicopter landing officers were available on each swing in case of any landings for crew change, resupply or the emergency evacuation of personnel.

SOLAS training was given to the Russian maritime crew during the survey. This included life raft and boat launching, communications and safety equipment checks.

Additional safety training and refresher courses in health, safety and environmental management were conducted by a dedicated PGS HSE adviser who joined the vessel for the second 'swing' out of Portland. All crew were expected to attend as did the client representatives.

5.8.2.4 Onboard Safety Equipment

All onboard safety equipment was in an acceptable condition. Emergency exits were kept clear at all times and all equipment such as making fire hoses, fire fighting apparatus and survival items was found correctly stowed in areas clear of any obstructions, to make them easily obtainable in case of emergency. Fire extinguishers were strategically placed throughout the vessel and on the decks. All were in good order and condition with current validation certificates.

Safety management and maintenance schedules were in place for such equipment as fire hoses, life boats, fire pumps, emergency generators, ropes and slings down to personnel safety equipment. Maintenance programmes were also in place for machinery such as compressors, engines, cranes and deck winches.

Life jackets were available in all cabins as well as a further 100 percent coverage stored in water proof containers located adjacent to the muster locations on the muster deck. All were in good order and had the required emergency lights and whistles attached. The jackets were regularly checked during musters and drills. Survival suits were stored on board.

The crew were familiar with the launching and the equipment carried in the life-rafts through safety drills, induction tours and safety courses. All rafts were certified and their expiration dates were valid. There were enough rafts to cover 200 percent of the usual compliment of personnel.

5.8.2.5 Protective Personal Equipment

The contractor supplied all safety-boots, hard-hats, hearing-protection and safety glasses. All equipment met the necessary safety requirements and was replaced when deemed necessary. Welding gloves, normal work gloves and additional face protection for use when cutting, grinding, welding and burning rubbish in the incinerator were also supplied. Eye wash stations were located in numerous strategic places around the vessel. These items were also covered by the management system and were inspected monthly and if any items were worn-out, in particular boots, these would be replaced by the contractor.

5.8.2.6 Reporting Procedures

PGS had accident and incident reporting systems in place, which were compatible with the E & P Forum. All near misses, accidents or incidents were reported to Woodside by the onboard CSR, irrespective of whether injury to personnel or damage to equipment or property resulted.

A Bridging Document was in place. This document combined the Woodside and PGSSE management systems into a single document and related to the management of all health, safety and environment issues pertaining to the vessel and the survey.

Woodside's instructions were that when a report of an oil spill and any other reports required by Government agencies took place, a verbal report was also to be made to Woodside within 2 hours followed by a completed incident report at the earliest opportunity.

STOP cards were also completed by the crew and these are included in the Appendix of this report.

In all 35 STOP cards were lodged and 25 hazard reports lodged. Refer to Appendix P of this report for the details of the reports.

5.8.2.7 Meetings and Reporting

A number of safety meetings took place during the survey period. Copies of the paperwork for these can be found in the appendices of this report and they were also forwarded to Woodside on the day of conducting the meetings. Prior to any work boat or fast rescue craft launch, cable work, tail buoy recovery and extraordinary work toolbox meetings were conducted on the Bridge in the presence of the Captain or officer in charge.

5.8.2.8 Safety Audits

In-house unsafe act audits and inspections were carried out periodically. The audits were carried out on predefined areas of operation, with the person carrying out the audit being independent from the operation itself. This system is considered excellent, and provides a good insight into how operations can be improved from an independent point of view.

5.8.2.9 Helicopter Operations

There were no helicopter operations conducted during the survey.

It was reported that a number of Total Marine personnel on the first swing did not hold current HUET training. It was noted in the Bridging Document that all personnel should hold current HUET and basic Sea Survival Certification as a minimum standard. As it eventuated no personnel departed from the vessel by helicopter during the survey.

17th October, 2003

Helideck audit and inspection by Woodside Aviation personnel.

17th October, 2003

Woodside and AMSA Vessel health, safety and environment audit.

5.8.2.10 Rescue Boat and Work Boats

The M/V ORIENT EXPLORER carried one work boat for in-water operations, which was mounted on the port side of the vessel. This craft also acted as a man overboard rescue boat in case of emergency.

Specific crews were rostered for any in-water recovery or operation. Drivers held current certification for the operation of the boat and a coxwain's certificate.

The boats were equipped with radios, GPS, and a communications check was to be made to the Bridge at 5 to 10 minute intervals any time the boats were deployed. During work boat operations the correct personal protective equipment was issued and worn by all concerned. Prior to the launching of the boats safety checks covering both equipment, communications, fuel water, oil and the general condition of the boats were always made. No small boat launches were made without the express permission of the Captain.

Toolbox meetings were conducted on the Bridge with the boat crew and Captain or chief officer in attendance. The plans and purpose of the launch were explained to all concerned. Additional radio and equipment checks were also completed at this time.

The number of small boat trips was 9 with an accumulated in-water activity time of 44.60 hours for the boats and personnel. During most launches the number of personnel manning the work boat was 4. Refer to Appendix G for HSE details including boat launch times and activities.

5.8.2.11 Resupply and Chase Boats

Two chase support vessels were made available for the survey duration, the SOUTHERN SALVOR and the PERFECT LADY

Both vessels remained either with the M/V ORIENT EXPLORER or were on call for the entire duration of the survey. Neither vessel departed the survey area due to mechanical or equipment related problems.

The PERFECT LADY travelled to Port Fairy to standby during periods of rough weather and again when one of her crew required transport ashore for medical treatment.

The SOUTHERN SALVOR sailed from Launceston, Tasmania departing on October 14th, en route to Portland, arriving on 17th October. The PERFECT LADY sailed from Port McDonnell in South Australia on the morning of October 17th to rendezvous with both the SOUTHERN SALVOR and the M/V ORIENT EXPLORER later in the morning.

The crew (7) of the SOUTHERN SALVOR and the PERFECT LADY (3) had been given a health, safety and environment introduction in Dampier by Woodside on 17th Oct prior to their departure to the survey area. The vessels were also instructed to assist with whale watch and reporting activities for the duration.

Any time the work boat was launched for cable repairs or maintenance either the chase boat or the PERFECT LADY would 'drop back' and standby close to the area of operations in case of an emergency or problems during the in-water maintenance

5.8.2.12 Chase Boat Fuel Consumption.

SOUTHERN SALVOR	October 14 th to October 31 st :	15.34 metric tons (ex. Tasmania)
	November 01 st to November 11 th :	14.66 metric tons (completion)
	Total Consumption:	30 metric tons
PERFECT LADY (ex. Pt McDonnell)	October 17 th to October 29 th :	3167 l
	October 29 th to November 10 th :	3160 l
	Total consumption:	6,327 l

Released at 18:00 hours on approval of Woodside to travel to Portland and prepare for a shallow water bathymetric survey on behalf of SANTOS.

5.8.3 Environment

5.8.3.1 General Observations

A very comprehensive environmental plan was in place and all personnel had been instructed in its requirements and were familiar with the content. All the procedures that were laid out were followed throughout the survey and the attitude of personnel to this was acceptable.

No rubbish or food scraps were disposed of overboard throughout the operation. No sewage, treated or otherwise, was disposed of overboard in the survey area or against MARPOL international regulations.

Waste oil was stored in onboard sludge tanks to be transferred to shore during port calls. A log of all used and waste oil was maintained by the chief engineer. The vessel was equipped with a sewage treatment plant, thus stopping the overboard discharge of any effluent or dirty water into the ocean.

No oil spills were reported during the survey.

A log was maintained for the receiving and disposal of all lithium batteries. Used batteries were stored and returned to shore for correct disposal. There were very strict guidelines in place for both the use and disposal of lithium type batteries. Normal alkaline batteries were sent ashore via the agents for either recycling or disposal by local authorities. No batteries were disposed of ashore during this survey.

Efforts to keep rubbish segregated onboard by the crew were made, with food scraps being separated from glass, metal and plastic. Food scraps were stored in plastic garbage containers, in order to adhere to the no rubbish overboard policy and to attempt to reduce the risk of shark attraction by disposing of waste overboard.

An incinerator was installed for the burning of paper, wood and other combustible items. Ash from the incinerator was stored onboard in drums to be offloaded at the first convenient port call. The incinerator was fuelled by waste oil from the vessel's main engines.

Metal, glass and plastics were separated for later disposal on-shore by local authorities. Non-burnable rubbish stored in containers on deck until off-loaded.

As far as can be ascertained, no environmental damage was caused to either land or sea animals during the course of the survey.

A garbage and incineration log was maintained and this was updated daily. This can be viewed in the Appendix to this report.

Fuel consumption for the M/V ORIENT EXPLORER was reported to Woodside on a daily basis.

5.8.3.2 *Weather*

From the time of departure to the commencement of acquisition conditions were moderate to rough, with winds up to 40 knots and a swell of up to 4 to 5 metres at times. Winds were generally from the south, south-west as was the general sea and swell.

Weather standbys were incurred on a number of occasions when the swell noise interference severely affected data quality or the swell affected the compass recorded positioning data or hampered stable cable depth control inside the contractual requirements.

20th Oct – Weather standby – abandon streamer deployment. Recover streamers 1 and 3 and travel to shelter in Portland Bay. Winds 30 to 35 knots, sea and swell up to 5 metres. Lost time - 6 hours.

21st Oct - Weather standby – at anchor in Portland Bay. Lost time – 24 hours.

22nd Oct – Weather standby - depart Portland, test tow procedures and travel out to deploy streamers again. Conditions have improved. Lost time – 16 hours.

Conditions improved dramatically in early November when the winds shifted and eased down to less than 5 knots at times. Swell was persistent and remained throughout the survey, varying in height from 2 to 4 metres overall.

The line direction was such that when acquiring data, the vessel was in the 'trough' of the swell or being hit side on most of the time making conditions on the vessel very difficult and tiring.

Local winds, sea state and pressure were logged on a 4-hourly basis by the Bridge staff and the graphed results are available in Appendix J of this report. The data was also sent to Woodside under separate cover.

Total downtime incurred due to weather and rough sea conditions was 65.733 hours.

5.8.3.3 Tides and Currents

From the outset tidal and current influence was minimal. Feather variation on line was in the range of 1.0 degree. Maximum feather observed was 4.0 degrees, but this was partially induced when steering for coverage.

No downtime was attributed to currents or tides. It is due to the low feather and minimal current effects that the infill coverage and requirements were extremely low.

5.8.3.4 Hazards – Drilling Rigs, Reefs, Fishing, Shipping, Eco-tourism, Debris, Piracy, Sharks

Drilling Rigs, Production Platforms and Pipe-Laying Barges

There were no drilling rigs or other offshore facilities inside the survey boundary. There was an offshore drilling rig some 10 kilometres to the south of the block and the pipe laying barge SEMAC-1 was positioned 3 kilometres adjacent to the south-eastern extremity of the area in the run-out zone for the survey.

Communications between all parties was maintained throughout via telephone and VHF radio channels. Emergency contact details were provided prior to the start of the survey by BHP for the pipe laying barge.

No downtime was incurred due to the location of any of the above-mentioned equipment, and the M/V ORIENT EXPLORER was able to acquire complete inshore line passes before the SE-MAC 1 moved from her Port Campbell location towards the BHP Minerva 3 and 4 well-heads.

Refer to the charts in Appendix A for a diagrammatic representation of these locations.

Reefs / Shoals and Shallow Areas

There were no shoals or shallow water regions inside the survey area. The closest survey line to the coast was positioned some 900 metres from the shoreline. It was agreed that the closest 5 sail-lines to the coast would only be acquired in daylight and with the assistance of the support vessel SOUTHERN SALVOR on station at all times.

Prior to acquisition a full bathymetric survey of the inshore lines was undertaken by Woodside Energy. Charts and bathymetry data were made available to the vessel. Water depths over the survey area varied from 15 m to 63 metres.

No lost time was attributed to shallow water, shoals or shoreline proximity.

Shipping / Fishing Activity

There was only one fishing vessel reported in the survey area and that was on 7th Nov, when contact was made with the FARMOR requesting him to move to allow safe passage for the M/V ORIENT EXPLORER and her streamers. The Captain of the vessel was not particularly co-operative at the time but did finally agree to relocate to a new position.

During a turn onto line 1252, heading 305 degrees on 11th November, the FARMOR had set a shark net very close to the survey line during the night and the line could not be acquired with the net in position. The vessel was contacted and again the Captain was not particularly co-operative and would not move or relocate his net till 08:00 hours that same morning.

The M/V ORIENT EXPLORER had to circle to allow the fisherman time to recover his net and lines. This was the only occurrence of incurred downtime being logged to fishing interference.

Total downtime/standby logged on 10th Nov was : 2.25 hours.

Other shark fishing vessels were contacted advising them of our status but these were generally well clear of the area and very co-operative.

Two cray-pots were recovered by the PERFECT LADY, and it is suspected they had been left on location from the previous season, judging by the general condition and growth on them.

The cray fishing season was due to open on 15th November, and all the fishermen were well aware of the presence of the survey operations from information given previously by Woodside management to the fishing community. However, the survey was completed prior to the commencement of the cray fishing season in Victoria.

Abalone divers were reported to operate occasionally the region, but these did not cause any interference to the survey operations. There was no contact and no reports of abalone or recreational divers in the area. Again Woodside had advised the association of the presence of the vessel. It was agreed that if the M/V ORIENT EXPLORER did encounter any diving activity she would remain clear by at least 1500 metres.

The South Australian based fishing vessel, PERFECT LADY was on location at all times to assist and warn fishermen and any local recreational boaters encountered of the survey operations.

Woodside had undertaken to advise fishing associations and communities in the region of the impending survey and a 1800 Survey hotline was updated daily with the vessel operations and location.

There was no attributable downtime logged due to shipping or fishing activities.

Eco-tourism Activities

Whale watching view-points were located at Logan's Beach adjacent to Warrnambool. This was outside of the survey area and no interruption or disruption of activities was evident or caused during the survey.

In-Sea Debris/Oil Pollution.

Minimal water-borne debris was sighted during the survey. No oil slicks or areas of oil sheen on the surface were encountered. There was no spillage of oil overboard or loss of containment from the survey vessel.

Piracy

There was no instances of piracy activity reported.

Sharks

The presence of sharks in the area was reported to be of significance but there were no shark sightings during the operations and there did not appear to be any streamer damage attributable to a shark attack.

5.8.3.5 External Seismic Interference

There were no reports of any external seismic interference during the survey operations.

5.8.3.6 Sea Life Monitoring

There were no reports of whales or cetaceans in the region from the vessel throughout the survey.

A whale watch was maintained from the Bridge at all times, with night vision binoculars being made available for use after dark. A 'soft-start' system was used for the energy source, whereby the guns would be enabled only a few at a time, slowly building up to the full array, so as to give warning to any nearby submerged sea-life of our presence. In addition a single airgun remained active during line changes and periods of streamer maintenance.

The chase and support vessels, PERFECT LADY and the SOUTHERN SALVOR also assisted with whale watch and reporting.

Reporting procedures and forms were in place and the crew of the M/V ORIENT EXPLORER had been briefed on the environmental policies and guidelines attached to it. A log of watch activities was maintained by the Bridge crew.

Strict guidelines were in place for continuing or halting survey operations in case of the presence of whales. If whales approached within 3 kilometres of the vessel operations were to cease until the whale or whales had left the area and a further 30 minutes observation was required before arrays could be initialised in the 'soft-start' mode.

Within 24 hours of initialising the source arrays at the start of the survey, an aerial survey of the block had been completed. This was in conjunction with a visual survey of 2 survey line traverses by the PERFECT LADY. Both were completed in the afternoon of October 23rd. No cetaceans were sighted during either of the aerial surveys and so acquisition commenced.

6.0 DAILY DIARIES SUMMARY

DAILY DIARY

October 17th, 2003

Start	End	Hours	Description / Comments	Charge
11:00	22:00	11.000	MOB/DeMOB (Mobilisation) Vessel arrives in Portland - bunker, resupply and conduct Woodside Inductions.	Mob/Demob
22:00	24:00	2.000	MOB/DeMOB (Mobilisation) Remain alongside in Portland - an audit by AMSA has highlighted a number of points/conditions that must be rectified and repaired prior to departure.	Mob/Demob
Total :		13.000		

October 18th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	24:00	24.000	MOB/DeMOB (Mobilisation) Remain alongside in Portland - rectifying AMSA requests. Late departure due to problems with ballast in tank 12.	Mob/Demob
Total :		24.000		

October 19th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	12:00	12.000	MOB/DeMOB (Mobilisation) Remain alongside in Portland - rectifying AMSA requests. Late departure due to problems with ballast in tank 12.	Mob/Demob
12:00	16:15	4.250	MOB/DeMOB (Travel t/f Port) Depart Portland and travel to survey area and prepare to deploy streamer 4.	Mob/Demob
16:15	24:00	7.750	MOB/DeMOB (Mobilisation) Commence deployment of streamer 4. A large swell up to 3-4 metres does not allow for safe deployment of two streamers in unison.	Mob/Demob
Total :		24.000		

October 20th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	11:00	11.000	MOB/DeMOB (Mobilisation) Continue with the deployment of streamer 4 - add four new sections to the head of the streamer.	Mob/Demob
11:00	16:00	5.000	MOB/DeMOB (Mobilisation) Swell too large to deploy wide tow door for streamer 4, plus depth control is becoming increasingly difficult. Commence recovery prior to deploying streamer 1 for ballast checks and testing.	Mob/Demob
16:00	18:00	2.000	MOB/DeMOB (Mobilisation) Prepare and commence deployment of streamer 1 in very marginal conditions.	Mob/Demob
18:00	24:00	6.000	Weather (Weather) Weather and swell conditions have deteriorated further and the forecast does not show any real improvement for the next 24 hours. Cable depth control is impossible to maintain and there is a good chance that streamers may surface and damage occur. After a discussion it	Standby

was agreed to stop all deployment and recover streamer 1 again and start travel and transit to Portland bay for shelter.

Total : 24.000

October 21st, 2003

Start	End	Hours	Description / Comments	Charge
00:00	08:00	8.000	Weather (Weather) En route to Portland bay to anchor and standby for an improvement in weather and sea conditions.	Standby
08:00	24:00	16.000	Weather (Weather) Remain on weather standby at anchor in Portland bay. Southern Salvor is also at anchor close to the location of the Orient Explorer.	Standby

Total : 24.000

October 22nd, 2003

Start	End	Hours	Description / Comments	Charge
00:00	08:00	8.000	Weather (Weather) Remain on weather standby in Portland - prepare to depart to check sea conditions in the survey area and conduct emergency towing tests.	Standby
08:00	14:00	6.000	Weather (Weather) Travel clear of Portland Bay and conduct emergency 3 towing tests with the Southern Salvor.	Standby
14:00	16:00	2.000	Weather (Weather) Travel to deep water and commence streamer deployment in slightly improved conditions after considerable weather standby.	Standby
16:00	24:00	8.000	MOB/DeMOB (Mobilisation) Continue with streamer deployment in marginal sea state - deploying streamers 4 and 1.	Mob/Demob

Total : 24.000

October 23rd, 2003

Start	End	Hours	Description / Comments	Charge
00:00	16:00	16.000	MOB/DeMOB (Mobilisation) Continue with deployment of streamer 1, 3 and 2. Aerial survey arranged for spotting of any whales or calves in the area and to check on fishing and vessel activity.	Mob/Demob
16:00	24:00	8.000	MOB/DeMOB (Mobilisation) Recover streamer 3 for front end reballasting near birds 14-17.	Mob/Demob

Total : 24.000

October 24th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	12:00	12.000	MOB/DeMOB (Mobilisation) Continue with deployment of streamers 3 and 2. Carry out Audit of the engine room and associated storage areas.	Mob/Demob
12:00	15:15	3.250	MOB/DeMOB (Mobilisation) Complete streamer deployment and deploy source for testing and acquisition.	Mob/Demob
15:15	15:23	0.133	MOB/DeMOB (Mobilisation) Initialise source using soft start procedures.	Mob/Demob

15:23	24:00	8.617	MOB/DeMOB (Mobilisation) Source firing - run setup tests - streamer separation and offset checks and measurements.	Mob/Demob
-------	-------	-------	---	-----------

Total : 24.000

October 25th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	00:46	0.767	MOB/DeMOB (Mobilisation) Source firing - run setup tests - streamer separation and offset checks and measurements.	Mob/Demob
00:46	01:17	0.517	MOB/DeMOB (Mobilisation) Run test line to check offsets and system setup. Problems with source arrays. Prepare to recover array 1.	Mob/Demob
01:17	05:15	3.967	MOB/DeMOB (Mobilisation) Complete array repairs - run to start of line and record Nearfield Hydrophone Tests.	Mob/Demob
05:15	05:28	0.217	Equip.Fail (Instrument) Line portion aborted and scratched. Not to be processed. Autofire on array 1 and missed the first 80 shots due to incorrect instrument settings at start of the survey. SP range 1001-1079	Contractor
05:28	07:23	1.917	Seq 001 : Line WO3ANT-1116P1 Abort line attempt due to auto-fire on . SP 1080-1258 - continue down the line till array repairs are complete.	Contractor
07:23	10:27	3.067	Seq 002 : Line WO3ANT-1116P2	Prime
10:27	12:42	2.250	Production (Line Change) Nominal 2.25 hour line change	Operations
12:42	12:53	0.183	Survey Shape (Extended L/C) Extended line change due to a tear-drop turn to leave shorter lines till the Semac 1 arrives on location. This means we will concentrate on the longer lines which will be affect more by the Semac operations.	Standby
12:53	17:08	4.250	Seq 003 : Line WO3ANT-1156P1	Prime
17:08	19:23	2.250	Production (Line Change) Nominal 2.35 hour line change.	Operations
19:23	19:37	0.233	Survey Shape (Extended L/C) Extended line change due to survey shape and short available distance between lines. Winds increasing as is the swell.	Standby
19:37	24:00	4.383	Seq 004 : Line WO3ANT-1108P1 Line continued through midnight. Time change to local summer time, (+1 hour) hence the apparent slow speed. on this line. Recover array 3 for repairs and maintenance.	Prime

Total : 24.000

October 26th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	02:13	2.217	Seq 004 : Line WO3ANT-1108P1 Line continued through midnight. Time change to local summer time, (+1 hour) hence the apparent slow speed. on this line. Recover array 3 for repairs and maintenance.	Prime
02:13	04:28	2.250	Production (Line Change) Nominal line change at northern end of survey area.	Operations
04:28	04:32	0.067	Survey Shape (Extended L/C)	Standby

			Extended line change - tear drop turn due to survey shape and shooting restrictions.	
04:32	08:55	4.383	Seq 005 : Line WO3ANT-1148P1	Prime
08:55	11:10	2.250	Production (Line Change)	Operations
			Nominal line change at southern end	
11:10	11:27	0.283	Survey Shape (Extended L/C)	Standby
			Extend line change due to survey shape and choice limitations	
11:27	16:24	4.950	Seq 006 : Line WO3ANT-1036P1	Prime
16:24	18:39	2.250	Production (Line Change)	Operations
18:39	18:53	0.233	Survey Shape (Extended L/C)	Standby
			Tear drop turn due to line limitations and survey shape	
18:53	23:28	4.583	Seq 007 : Line WO3ANT-1140P1	Prime
23:28	24:00	0.533	Production (Line Change)	Operations
	Total :	24.000		

October 27th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	01:43	1.717	Production (Line Change)	Operations
01:43	02:00	0.283	Survey Shape (Extended L/C)	Standby
			Extended line change due to tear drop turn, minimal line choice due to priority lines and optimizing time and trying to reduce interference from Semac 1.	
02:00	06:44	4.733	Seq 008 : Line WO3ANT-1100P1	Prime
06:44	08:59	2.250	Production (Line Change)	Operations
			Nominal line change.	
08:59	09:12	0.217	Survey Shape (Extended L/C)	Standby
			Tear drop turn due to line choice restrictions and directions.	
09:12	13:45	4.550	Seq 009 : Line WO3ANT-1132P1	Prime
13:45	15:47	2.033	Production (Line Change)	Operations
15:47	20:20	4.550	Seq 010 : Line WO3ANT-1004P1	Prime
			Missed first 22 shots at the SOL due to a Syntrak halt during the run in - continue the line to completion.	
20:20	22:34	2.233	Production (Line Change)	Operations
22:34	24:00	1.433	Seq 011 : Line WO3ANT-1124P1	Prime
			Line continued through midnight local time. Aborted line at SP 1678 and circled due to air-leak on gun array.	
	Total :	24.000		

October 28th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	01:13	1.217	Seq 011 : Line WO3ANT-1124P1	Prime
			Line continued through midnight local time. Aborted line at SP 1678 and circled due to air-leak on gun array.	
01:13	04:30	3.283	Equip.Fail (Source)	Contractor
			Circle and repair air leak on array 1.	
04:30	06:17	1.783	Seq 012 : Line WO3ANT-1124P2	Prime
06:17	08:04	1.783	Production (Line Change)	Operations
08:04	12:35	4.517	Seq 013 : Line WO3ANT-1012P1	Prime
			Miss SP 2102-2153 due to Syntrak crash - continue down line and reboot the system then continue recording to completion.	
			Data tape 35653 NOT TO BE PROCESSED.	
12:35	14:50	2.250	Production (Line Change)	Operations

14:50	19:25	4.583	Nominal line change Crew Change (Port Call) Start recovery of streamer for crew change. This time is shared 50/50 with Woodside till start of acquisition after the scheduled crew change.	Contractor
19:25	24:00	4.583	Wside.Req (Port/Crew Change) Streamer recovery for crew change - time is shared 50/50 with PGS till start of acquisition after scheduled crew change on Wednesday 29th October in Portland.	Standby
Total :		24.000		

October 29th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	07:00	7.000	Wside.Req (Port/Crew Change) Complete streamer recovery for crew change 01:12 hours local time and commence transit to Portland.	Standby
07:00	14:00	7.000	Crew Change (Port Call) Vessel arrived and secured alongside in Portland at 07:10 hours local time. PGS share 50% share of crew change time. Departure delayed awaiting arrival of late PGS crew persons from overseas.	Contractor
14:00	17:00	3.000	PGS (Contractor) Delay departure from Portland due to late PGS on-signer.	Contractor
17:00	17:30	0.500	Equip.Fail (Ship) Vessel delayed start due to main engine fuel problems on initial start-up.	Contractor
17:30	20:45	3.250	Wside.Req (Port/Crew Change) Woodside 50/50 share of crew change time following departure from Portland. Conduct a vessel towing test after departure from Portland. Commence streamer deployment at 18:20 hours local time in fair conditions.	Standby
20:45	24:00	3.250	Crew Change (Port Call) PGS 50/50 share of crew change time involving travel after departure from Portland following the scheduled crew change.	Contractor
Total :		24.000		

October 30th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	12:00	12.000	Wside.Req (Port/Crew Change) Deploying streamers after port call and crew change - Woodside 50/50 share of time for deployment after Port call.	Standby
12:00	24:00	12.000	Crew Change (Port Call) Continue with streamer deployment after port call and crew change in Portland - PGS 50/50 share of time.	Contractor
Total :		24.000		

October 31st, 2003

Start	End	Hours	Description / Comments	Charge
00:00	09:07	9.117	Wside.Req (Port/Crew Change) Continue deployment of streamers after scheduled crew change. Woodside share of crew change time for deployment after Port call for crew change.	Standby
09:07	18:15	9.133	Crew Change (Port Call)	Contractor

			Complete deployment of all equipment - in a position to commence and continue acquisition if weather had been favourable.	
18:15	24:00	5.750	Weather (Weather)	Standby
			Go on to weather standby - sea and swell 3-5 metres, winds variable and gusting to 40 knots at times.	
	Total :	24.000		

November 1st, 2003

Start	End	Hours	Description / Comments	Charge
00:00	13:59	13.983	Weather (Weather)	Standby
			Continue weather standby - prepare to continue acquisition on line 1092	
13:59	14:13	0.233	Equip.Fail (Instrument)	Contractor
			Missed SP 1001-1099 due to Spectra gun controller halt at SOL - reboot and continue down the line.	
14:13	18:41	4.467	Seq 014 : Line WO3ANT-1092P1	Prime
			SP 2112-2210 edited to be reshot - Syntrak on-line recording system halt - rebooted and continued down the line.	
18:41	20:56	2.250	Production (Line Change)	Operations
20:56	21:20	0.400	Survey Shape (Extended L/C)	Standby
			Tear drop turn at end of line due to line restrictions.	
21:20	24:00	2.667	Seq 015 : Line WO3ANT-1164P1	Prime
	Total :	24.000		

November 2nd, 2003

Start	End	Hours	Description / Comments	Charge
00:00	02:34	2.567	Seq 015 : Line WO3ANT-1164P1	Prime
02:34	04:49	2.250	Production (Line Change)	Operations
			Nominal line change allowance.	
04:49	24:00	19.183	Equip.Fail (Streamer)	Contractor
			Recover source and front of streamer 4 for reballasting on depth controllers 3-7. Running deep down to 12 metres.	
	Total :	24.000		

November 3rd, 2003

Start	End	Hours	Description / Comments	Charge
00:00	17:16	17.267	Equip.Fail (Streamer)	Contractor
			Complete ballasting of streamer 4, adjust ballast on streamers 2 and 3 at the tail end and replace the lead-in on streamer 4. Transit to line 1012 to acquire SP 2092-2153 which were not recorded during an earlier sequence due to a Syntrak crash on-line.	
17:16	17:24	0.133	Seq 016 : Line WO3ANT-1012P2	Contractor
			Acquire reshoot due to Syntrak crash on first line attempt. Line is now complete.	
17:24	19:48	2.400	Equip.Fail (Instrument)	Contractor
			Non-chargeable line change after reshoot due to Syntrak halt on line 1012	
19:48	22:56	3.133	Seq 017 : Line WO3ANT-1260P1	Prime
22:56	24:00	1.067	Production (Line Change)	Operations
	Total :	24.000		

November 4th, 2003

Start	End	Hours	Description / Comments	Charge
-------	-----	-------	------------------------	--------

00:00	01:01	1.017	Production (Line Change)	Operations
01:01	05:46	4.750	Seq 018 : Line WO3ANT-1044P1	Prime
05:46	08:00	2.233	Production (Line Change)	Operations
08:00	12:25	4.417	Seq 019 : Line WO3ANT-1172P1	Prime
12:25	14:23	1.967	Production (Line Change)	Operations
14:23	19:03	4.667	Seq 020 : Line WO3ANT-1020P1	Prime
19:03	20:43	1.667	Production (Line Change)	Operations
20:43	24:00	3.283	Seq 021 : Line WO3ANT-1180P1	Prime
	Total :	24.000		

November 5th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	01:06	1.100	Seq 021 : Line WO3ANT-1180P1	Prime
01:06	03:06	2.000	Production (Line Change)	Operations
03:06	07:46	4.667	Seq 022 : Line WO3ANT-1052P1	Prime
07:46	10:01	2.250	Production (Line Change)	Operations
10:01	10:04	0.050	Equip.Fail (Instrument)	Contractor
			Miss the SOL due to a Syntrak lock-up at the SOL.	
10:04	14:16	4.200	Seq 023 : Line WO3ANT-1188P1	Prime
14:16	16:10	1.900	Production (Line Change)	Operations
16:10	21:03	4.883	Seq 024 : Line WO3ANT-1028P1	Prime
21:03	22:37	1.567	Production (Line Change)	Operations
22:37	24:00	1.383	Seq 025 : Line WO3ANT-1196P1	Prime
	Total :	24.000		

November 6th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	02:51	2.850	Seq 025 : Line WO3ANT-1196P1	Prime
02:51	04:54	2.050	Production (Line Change)	Operations
04:54	06:09	1.250	Seq 026 : Line WO3ANT-1020I1	Infill/Stby
06:09	06:16	0.117	Seq 026 : Line WO3ANT-1020I1	Contractor
			Acquire non-chargeable reshoot of data due to a Syntrak lock-up during earlier sequence 020.	
06:16	07:52	1.600	Seq 026 : Line WO3ANT-1020I1	Infill/Stby
07:52	07:58	0.100	Seq 026 : Line WO3ANT-1020I1	Contractor
			Acquire non-chargeable reshoot data due to Syntrak lock-up during sequence 24.	
07:58	09:37	1.650	Seq 026 : Line WO3ANT-1020I1	Infill/Stby
09:37	11:24	1.783	Infill (Infill L/C)	Infill/Stby
11:24	11:33	0.150	Seq 027 : Line WO3ANT-1196I1	Contractor
			Line aborted just after the start due to failure of streamer 3 - circle and complete repairs.	
11:33	22:49	11.267	Equip.Fail (Streamer)	Contractor
			Abandon line attempt - troubleshoot problems with streamer 3. Replace front modules and connectors, programme plugs, and replace 'O" ring seals. Run tests - streamer 3 acceptable.	
22:49	24:00	1.183	Infill (Infill)	Infill/Stby
			Progressive infill pass.	
	Total :	24.000		

November 7th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	02:43	2.717	Infill (Infill)	Infill/Stby
			Progressive infill pass.	
02:43	04:44	2.017	Infill (Infill L/C)	Infill/Stby
			Line change after recording infill	

04:44	05:18	0.567	Equip.Fail (Instrument) Missed SP 1001-1230 due to tape deck and Syntrak problems at the SOL - continue down the line. Tape reel nos: 35719-35721	Contractor
05:18	09:24	4.100	Seq 029 : Line WO3ANT-1060P1 Miss SP 1001-1230 due to tape deck and Syntrak recording problems.	Prime
09:24	11:18	1.900	Production (Line Change)	Operations
11:18	15:14	3.933	Seq 030 : Line WO3ANT-1204P1	Prime
15:14	17:09	1.917	Production (Line Change)	Operations
17:09	21:54	4.750	Seq 031 : Line WO3ANT-1068P1	Prime
21:54	23:49	1.917	Production (Line Change)	Operations
23:49	24:00	0.183	Seq 032 : Line WO3ANT-1212P1	Prime
	Total :	24.000		

November 8th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	03:41	3.683	Seq 032 : Line WO3ANT-1212P1	Prime
03:41	05:41	2.000	Production (Line Change)	Operations
05:41	10:15	4.567	Seq 033 : Line WO3ANT-1076P1 Missed the first 2 SP's of the line due to a Syntrak lock-up just prior to SOL.	Prime
10:15	12:23	2.133	Production (Line Change)	Operations
12:23	16:06	3.717	Seq 034 : Line WO3ANT-1220P1	Prime
16:06	18:02	1.933	Production (Line Change)	Operations
18:02	22:46	4.733	Seq 035 : Line WO3ANT-1084P1	Prime
22:46	24:00	1.233	Production (Line Change)	Operations
	Total :	24.000		

November 9th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	00:52	0.867	Production (Line Change)	Operations
00:52	04:26	3.567	Seq 036 : Line WO3ANT-1228P1	Prime
04:26	06:28	2.033	Production (Line Change)	Operations
06:28	11:05	4.617	Seq 037 : Line WO3ANT-1084I1	Infill/Stby
11:05	13:24	2.317	Infill (Infill L/C) Line Change after infill chargeable as standby.	Infill/Stby
13:24	17:04	3.667	Seq 038 : Line WO3ANT-1236P1	Prime
17:04	19:06	2.033	Production (Line Change)	Operations
19:06	23:54	4.800	Seq 039 : Line WO3ANT-1116I1 Acquire infill chargeable at standby rate.	Infill/Stby
23:54	24:00	0.100	Infill (Infill L/C) Chargeable line change after infill acquisition.	Infill/Stby
	Total :	24.000		

November 10th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	02:19	2.317	Infill (Infill L/C) Chargeable line change after infill acquisition.	Infill/Stby
02:19	02:40	0.350	Equip.Fail (Streamer) Non-chargeable reshoot of SP 2588-2415 missed on an earlier line sequence due to telemetry and a Syntrak lock-up. Original sequence was 023 recorded on 5th November. Line now complete.	Contractor
02:40	03:26	0.767	Equip.Fail (Streamer) Line change to next line after reshoot due to Syntrak problems - PGS charge.	Contractor

03:26	03:46	0.333	Equip.Fail (Instrument) Non-chargeable reshoot of data missed on a earlier sequence due to Syntrak lock-up and tape errors. (original sequence was 025 was recorded on 5-6 Nov) Line now complete	Contractor
03:46	07:52	4.100	Equip.Fail (Instrument) Line Change after reshoot due to Syntrak lock-up on earlier line.	Contractor
07:52	11:12	3.333	Seq 042 : Line WO3ANT-1244P1	Prime
11:12	13:06	1.900	Production (Line Change)	Operations
13:06	15:03	1.950	Seq 043 : Line WO3ANT-1116P3 Reshoot of first portion of sequence 2 abandoned due to Syntrak lockup at SOL followed by an air-leak on array 1. This portion was not charged during the first attempt.	Prime
15:03	17:48	2.750	Equip.Fail (Source) Line change to next reshoot - previous was a non-chargeable reshoot due to an air-leak on array one, making this line change a PGS charge.	Contractor
17:48	18:10	0.367	Equip.Fail (Instrument) Reshoot of line portion , on sequence 032 edited due to a Syntrak lockup on line.	Contractor
18:10	22:27	4.283	Equip.Fail (Instrument) Line change after reshoot caused by Syntrak lockup during sequence 032.	Contractor
22:27	24:00	1.550	Seq 045 : Line WO3ANT-1252P1	Prime
	Total :	24.000		

November 11th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	01:31	1.517	Seq 045 : Line WO3ANT-1252P1	Prime
01:31	03:35	2.067	Production (Line Change)	Operations
03:35	03:48	0.217	Seq 046 : Line WO3ANT-1092P2 Reshoot SOL due to instrument problems on the first attempt. Missed the original SOL due to a Syntrak lock-up. Now complete.	Contractor
03:48	06:06	2.300	Production (Line Change) Line change after reshoot due to Syntrak problems.	Operations
06:06	06:19	0.217	Equip.Fail (Instrument) Reshoot of data not recorded during original sequence 014 - Syntrak crash.	Contractor
06:19	08:44	2.417	Equip.Fail (Instrument) Line change after reshoot caused by Syntrak failure - PGS account.	Contractor
08:44	10:59	2.250	Fishing Int (Fishing Activity) Circle prior to the SOL 1252 infill due to fishing activity and shark nets on the line location. The name of the vessel is 'Formor'.	Standby
10:59	14:05	3.100	Seq 048 : Line WO3ANT-1252I1 Acquire final infill pass	Infill/Stby
14:05	16:03	1.967	Infill (Infill L/C)	Infill/Stby
16:03	16:37	0.567	Seq 049 : Line WO3ANT-1060P2 Last line of acquisition of the Antares survey.	Prime
16:37	24:00	7.383	MOB/DeMOB (Demobilisation) Commence recovery of 3 streamers.	Mob/Demob
	Total :	24.000		

November 12th, 2003

Start	End	Hours	Description / Comments	Charge
00:00	12:00	12.000	MOB/DeMOB (Demobilisation) Continue and complete retrieval of streamers plus 1 hour allowance for demob in marginal weather and sea conditions.	Mob/Demob
		Total :	12.000	
		Grand Total :	625.000	

6.2 HEALTH, SAFETY AND ENVIRONMENT DIARYOctober 17th, 2003

Crew Number: 60 (Marine = 36; Seismic = 21; Contractor = 3)
Fuel Usage: 14 Cubic Metres - Survey Total = 14 Cubic Metres.

Comments:

Vessel completed transit from Singapore and arrived in Portland, Victoria, at 11:00 hours. Crew given Woodside HSE Introduction and commenced both Woodside and AMSA ship inspections.

HSE Items:

11:00 - 17:00 HSE Induction-Inspection [IT]
Inspection of vessel by AMSA representatives.
13:00 - 17:00 Audit/Inspection/Training/Safety . [HSE]
Woodside delivered HSE presentation and Introduction for all personnel.

October 18th, 2003

Crew Number: 59 (Marine = 35; Seismic = 21; Contractor = 3)
Fuel Usage: 8 Cubic Metres - Survey Total = 22 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard.

HSE Items:

09:00 - 16:00 Audit/Inspection/Training/Safety . [HSE]
Complete Woodside Audits and Inspections of the vessel.

October 19th, 2003

Crew Number: 59 (Marine = 35; Seismic = 21; Contractor = 3)
Fuel Usage: 2 Cubic Metres - Survey Total = 24 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. New crew-persons given vessel HSE and Safety Introduction prior to departure.

HSE Items:

11:00 - 11:45 HSE Induction-Inspection [IT]
New crew persons (4) taken on vessel inspection and given Safety Introduction.
15:00 - 15:30 Toolbox Meeting/Debrief [TB]
Meeting conducted in the Recording Room to address the deployment of streamer 4 in marginal sea conditions.

October 20th, 2003

Crew Number: 59 (Marine = 35; Seismic = 21; Contractor = 3)

Fuel Usage: 10 Cubic Metres - Survey Total = 34 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. Stop streamer deployment due to rough weather and large swell.

HSE Items:

Nothing To Report

October 21st, 2003

Crew Number: 59 (Marine = 35; Seismic = 21; Contractor = 3)

Fuel Usage: 10 Cubic Metres - Survey Total = 44 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. Meeting convened to discuss or formulate an action plan for all action points raised from the recent Woodside HSE Audit.

HSE Items:

14:00 - 15:00

Safety Meeting [SM]

Meeting conducted to address issues and action points from the recent HSE Audit of the vessel by Woodside

October 22nd, 2003

Crew Number: 59 (Marine = 35; Seismic = 21; Contractor = 3)

Fuel Usage: 5 Cubic Metres - Survey Total = 49 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. Check of all Emergency Contact telephone numbers. Run vessel three towing tests and scenarios.

HSE Items:

03:00 - 03:40

Audit/Inspection/Training/Safety . [HSE]

Test emergency telephone numbers

08:45 - 09:00

Toolbox Meeting/Debrief [TB]

Toolbox meeting prior to start of first tow drill.

09:00 - 09:30

Emergency Boat /Towing Drill [EBD]

Conduct towing drill with Southern Salvor

09:45 - 10:00

Toolbox Meeting/Debrief [TB]

Debrief after first towing test.

10:45 - 11:00

Toolbox Meeting/Debrief [TB]

Toolbox meeting prior to start of second towing drill.

11:00 - 11:30

Emergency Boat /Towing Drill [EBD]

Conduct second towing drill with Southern Salvor

11:30 - 11:45

Toolbox Meeting/Debrief [TB]

Second debrief after towing tests

12:45 - 13:00

Toolbox Meeting/Debrief [TB]

Conduct toolbox prior to third towing hookup exercise.

13:00 - 14:00

Emergency Boat /Towing Drill [EBD]

Run third tow drill exercise with Southern Salvor

14:00 - 14:15

Toolbox Meeting/Debrief [TB]

Final debrief after final/third towing test

October 23rd, 2003

Crew Number: 59 (Marine = 35; Seismic = 21; Contractor = 3)

Fuel Usage: 11 Cubic Metres - Survey Total = 60 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. Aerial whale and calf survey completed with additional checks with the Perfect Lady running two traverses through the area.

HSE Items:

Stop Card Issued - 2 issued.

14:00 - 17:00

Audit/Inspection/Training/Safety . [HSE]

Aircraft sent to check for presence of any whales or calves in the area - nothing sighted.

16:00

[]

Entrance to Engine room from port side on 4th deck very dark - fit highlighted reflective tape.

October 24th, 2003

Crew Number: 59 (Marine = 35; Seismic = 21; Contractor = 3)

Fuel Usage: 11 Cubic Metres - Survey Total = 71 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. STOP Card Details. While attending a toolbox meeting on the bridge for workboat operation, was told by Ch Mate Adviser and PC that seaman involved in launching operation would not be involved in toolbox as this has been the norm on this vessel. This should never be the case! Good communication should always start at the top and filter down to all personal involved in operation.

HSE Items:

Stop Card Issued - 1 issued.

07:00 - 07:15

Toolbox Meeting/Debrief [TB]

Conduct tool-box meeting prior to workboat launch for streamer maintenance.

07:30 - 09:37

Work Boat [WB] - 4 occupants

Workboat launch for cable maintenance and transfer of supplies from the Perfect Lady

11:00 - 11:45

Audit/Inspection/Training/Safety . [HSE]

Inspection of engine room and associated storage area by the PC, Clients, Master and Chief Engineer.

15:15 - 15:30

Toolbox Meeting/Debrief [TB]

Conduct toolbox meeting prior to launching workboat for cable ballasting and TS dip.

15:30 - 17:52

Work Boat [WB] - 4 occupants

Workboat launch for cable maintenance and recording TS Dip

22:00

Non work related illness [NWR] - Report #1

A crew person on the Perfect Lady fainted during the night and had to be taken to Port Fairy where he was put into hospital for observation and treatment if required.. Arrangements were made by the Captain of the Perfect Lady.

October 25th, 2003

Crew Number: 58 (Marine = 34; Seismic = 21; Contractor = 3)

Fuel Usage: 11 Cubic Metres - Survey Total = 82 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. One crew person less on the Perfect Lady.

HSE Items:

13:00 - 14:00 Safety Meeting [SM]

Conduct general crew safety meeting - all non-essential persons required to attend.

October 26th, 2003

Crew Number: 58 (Marine = 34; Seismic = 21; Contractor = 3)

Fuel Usage: 14 Cubic Metres - Survey Total = 96 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. 17:10-23:59 Perfect Lady released to search for reported downed aircraft, south of Warrnambool.

HSE Items:

13:00 - 13:25 Emergency Boat /Towing Drill [EBD]

Conduct emergency helicopter crash drill. Cover communications, emergency response, radio, equipment and fire-fighting systems.

October 27th, 2003

Crew Number: 58 (Marine = 34; Seismic = 21; Contractor = 3)

Fuel Usage: 15 Cubic Metres - Survey Total = 111 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings.

HSE Items:

13:00 - 13:25 Emergency Boat /Towing Drill [EBD]

Conduct SOLAS training for Russian marine Crew

October 28th, 2003

Crew Number: 58 (Marine = 34; Seismic = 21; Contractor = 3)

Fuel Usage: 17 Cubic Metres - Survey Total = 128 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. STOP Card Details Washing machines in room with dryers playing up. Takes around 3 hrs to do a 40 min cycle. Water pressure low or machines' filters blocked. Stainless steel fridge in Galley too cold. Freezing all food spoiling the products. Adjust the thermostat somehow. Positive observation -mechanics cleaning and sweeping decks of debris after cable work.

HSE Items:

Stop Card Issued - 2 issued.

12:00 - 12:19

Toolbox Meeting/Debrief [TB]

Toolbox meeting prior to streamer recovery.

October 29th, 2003

Crew Number: 59 (Marine = 34; Seismic = 22; Contractor = 3)
 Fuel Usage: 9 Cubic Metres - Survey Total = 137 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. A specific HSE adviser has been included in the crew manifest.

HSE Items:

10:30 - 13:30 HSE Induction-Inspection [IT]
 Conduct 2 Woodside HSE Inductions for new crew while the vessel was alongside in Portland for its scheduled crew change.

17:55 - 18:20 Emergency Boat /Towing Drill [EBD]
 Run towing hook-up test for new crew. Time to complete hook-up was 15 minutes.

18:30 - 18:45 Toolbox Meeting/Debrief [TB]
 Toolbox meeting prior to streamer deployment in marginal conditions

October 30th, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)
 Fuel Usage: 7 Cubic Metres - Survey Total = 144 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. Absent crew person joins the Perfect Lady. The patient that was taken ashore last week returned with medical clearance to continue work offshore.

HSE Items:

13:00 - 13:25 Emergency Boat /Towing Drill [EBD]
 Conduct Emergency Boat Drill - inspect life jackets and immersion suit donning demonstration.

October 31st, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)
 Fuel Usage: 11 Cubic Metres - Survey Total = 155 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sightings. STOP card Details Floor mats on entrance to Accommodation on deck 4 are very "ratty" and very slippery (look very bad too). Suggestion to improve: rubber backed mats should be ordered. Positive Observation: A Rep (limo driver) was at the airport to take (some) crew members to domestic airport terminal. Several crew members sent to work @ crew change with no idea of what was happening, i.e. -no agent of contact; no details of where to fly after Melbourne. Is it so hard to notify crew by mail or phone call of arrangements at crew change

HSE Items:

Stop Card Issued - 2 issued.

01:34 Hazard Report [HR] - Report #PGS134
 Closing cocks on sounding pipes left open.

November 1st, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)

Fuel Usage: 5 Cubic Metres - Survey Total = 160 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sighting HSE Audit and Inspection by Captain, PC and HSE Adviser - review audit findings.

HSE Items:

- 01:35 Hazard Report [HR] - Report #PGS135
Remove AC and seismic reel when weather permits
- 01:36 Hazard Report [HR] - Report #PGS136
Improve securing of ladder stored next to exhaust pipes
- 01:37 Hazard Report [HR] - Report #PGS137
Workboat roller left in Lithium Battery Store - removed and correctly stored
- 01:38 Hazard Report [HR] - Report #PGS138
Fan blocking escape hatch in Cable Store - removed and correctly stowed
- 01:39 Hazard Report [HR] - Report #PGS139
Gangway in engine room has loose floor plate - need to be secured.
- 01:40 Hazard Report [HR] - Report #PGS140
Place sign at entry to paint locker to remind personnel to switch on the ventilating fan
- 10:15 - 10:45 HSE Induction-Inspection [IT]
HSE Inspection by Captain, HSE Adviser and Party Chief. Check on outstanding action points from last audit.
- 13:00 - 13:25 Toolbox Meeting/Debrief [TB]
Toolbox meeting on Bridge to discuss communications and plans when approaching the Semac-1 at the end of line 1090

November 2nd, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)

Fuel Usage: 5 Cubic Metres - Survey Total = 165 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sighting. STOP Card Details Gunner using buddy system and PPE while working aloft (good effort but PPE outdated and incorrect).

HSE Items:

- Stop Card Issued - 1 issued.
- 11:00 - 11:25 Fire Drill [FD]
Conduct fire drill - all non-essential persons required to attend. Don and test fire fighting equipment and systems for both fire teams 1 and 2.
- 11:30 - 11:40 Toolbox Meeting/Debrief [TB]
Debrief following fire drill exercise.
- 13:00 - 13:30 Safety Committee Meeting [SCM]
Safety Committee Meeting with PC, Captain, Client reps and HSE Adviser.

November 3rd, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)

Fuel Usage: 6 Cubic Metres - Survey Total = 171 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sighting. STOP Card Details Noticed while vessel was moving around a lot and water on main deck: slip hazard. To prevent slip hazard in rough seas have walkways painted with anti-slip paint (paint with sand). This would increase safety of vessel personnel Hygiene concerns: some of the crew sine in the mess room with dirty coveralls on. Our policy on board Orient is no coveralls in the Mess room. All crew should follow this policy. Gunner working aloft w/safety belt - belts should have been destroyed years ago. 1) While attending fire drill noticed medical team mustered in wrong position. Medical team or emergency team should meet at hospital and report to medic, no in heli-reception. 2) Medic shall carry a radio at all times as an emergency can happen any time. I think a rehash of procedure for medical emergency team should be revised. To make for a reliable and efficient team. Location of aerosol can Disposal: unable to locate disposal bin/area for aerosol cans. Have asked people and have been directed to various locations, but no bin. Require adequate signs to locate this disposal area. Unsafe condition: Laundry, Level 2: floor covered with water possibly from leaking washing machine. Repair leak in Machine.

HSE Items:

Stop Card Issued - 5 issued.

- 01:41 Hazard Report [HR] - Report #PGS141
Public toilet areas should be cleaned twice daily - implemented
- 01:42 Hazard Report [HR] - Report #PGS142
Water filter galley should be replaced and checked regularly
- 01:43 Hazard Report [HR] - Report #PGS143
Slippery tiles in the galley near the sink, and some are lifting. Should be replaced to prevent trip and slip hazards.
- 01:44 Hazard Report [HR] - Report #PGS144
Better and more secure metal pegs should be available for the galley range pots during rough weather.
- 01:45 Hazard Report [HR] - Report #PGS145
Lighting in the galley should be improved.
- 01:46 Hazard Report [HR] - Report #PGS146
Wooden cupboards in the galley are failing and should be replaced
- 01:49 Hazard Report [HR] - Report #PGS149
There are no emergency flashlights near the supplied smoke-hood.
- 01:50 Hazard Report [HR] - Report #PGS150
Shelving in the refridgerators should be resecured and replaced - a general refit of all shelving should be reviewed.
- 01:51 Hazard Report [HR] - Report #PGS151
Ice is forming on the pipes and walls of refridgerators and then drips on to the floor causing slip, trip hazards. Improved insulation is required.
- 01:52 Hazard Report [HR] - Report #PGS152
Cock-roaches seem to have gone into hiding. Any plans for extermination during the next port call?
- 10:30 - 10:45 Toolbox Meeting/Debrief [TB]
Toolbox meeting prior to launching workboat for cable ballasting
- 10:57 - 11:50 Work Boat [WB] - 4 occupants
Workboat launch for cable ballasting at the tail of streamer 2.
- 13:00 - 13:45 Audit/Inspection/Training/Safety . [HSE]
Conduct HSE Training for PGS Crew . This will be done daily for the next 5 days. Instructor is PGS HSE Adviser from Singapore.
- 14:00 - 14:15 Toolbox Meeting/Debrief [TB]
Toolbox Meeting prior to launch of work boat.
- 14:56 - 16:49 Work Boat [WB] - 4 occupants
Boat launch for TS Dip and continuing streamer ballasting in reasonable weather and swell conditions

November 4th, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)

Fuel Usage: 21 Cubic Metres - Survey Total = 192 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sighting. STOP Card Details Clothes Dryers: a major cause of ship fires is due to dryers. The filters of which clog up. The ones on board have no signs, indicating that they should be cleaned before use. I tried to clean one filter but found it almost impossible to remove dirt. Require signs to be posted regarding this hazard. In order for HSE practices to be understood and properly utilised it has to be accessible and easy to use. This is an understood fact that cannot be denied. We have a 423-page manual that has no links or page numbers. To find something you have to wade through every page of the document - this is totally unacceptable. Documents affected: EAYYVES00, EAYYORI00. Muster stations not shown on safety plan. Use of alternative muster station should be made a lot clearer. Muster station should be clearly marked. Plastic cups. I notice that foam cups are being put in the "combustible" bin. These are plastic and should be in plastics. Require: 1) People to be more diligent in their disposal habits. 2) Remove these plastic cups from use as burning them causes gases that harm the ozone. ER Chemical Locker: 1) No MSDS in English 2) No PPE (face mask, gloves). PPE to be supplied. MSDS to be photocopied from original. Engine Control Room is a designated smoking area!!! There are no smoking persons who are exposed to cigarette smoke. Suggest removing Smoking Area sign and place No Smoking.

HSE Items:

Stop Card Issued - 1 issued.

Stop Card Issued - 3 issued.

13:00 - 13:45	<u>Audit/Inspection/Training/Safety . [HSE]</u> HSE training by PGS HSE Adviser.
13:05 - 13:15	<u>Toolbox Meeting/Debrief [TB]</u> Toolbox meeting prior to work-boat deployment
13:23 - 13:59	<u>Work Boat [WB] - 4 occupants</u> Deploy workboat for removal of leads from the head of streamer 4.
14:30 - 14:45	<u>Toolbox Meeting/Debrief [TB]</u> Meeting conducted prior to launch of the workboat for depth controller replacement.
14:56 - 15:28	<u>Work Boat [WB] - 4 occupants</u> Workboat launched to replace depth controller 11 on streamer 4.

November 5th, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)

Fuel Usage: 10 Cubic Metres - Survey Total = 202 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sighting. STOP Card Details Addition to segregating waste - Plastic, Glass, Cans. What about recycling, i.e. crushing aluminum cans, grinding glass, grinding plastic. Bag each of this individually and recycle. It would require the purchase of suitable equipment. But would be worth it. The trash bin in the common toilet on Deck 2 needs to be bigger obviously as it overflows with used paper towels Safety Plans posted through the ship are inconsistent with each other and are in most cases incorrect. Deck numbers do not match deck designation on plan. Have spoken to captain - plans need to be upgraded. Cabin Safety Plans. Most are faded and poor. None have the MOB alarm signal alarm. Spoken to Captain - plans need to be upgraded. Deck Numbering: In stairwell deck numbering is high up on the bulkhead. If area filled

with smoke then numbers may not be able to be seen. Have spoken to Captain and suggested that numbering be located at the bottom of bulkheads for clear viewing. Emergency Plan The coloured emergency plan does not contain the MOB alarm on details to go with it. As this is an emergency plan It should contain this information. Spoken to captain. Hazard report - regarding lithium batteries which were found on the back deck and should have been correctly stowed in the battery storage area. They were recovered, cleaned and correctly stored.

HSE Items:

Stop Card Issued - 8 issued.

09:00 - 09:45

Emergency Boat /Towing Drill [EBD]

Extreme Weather Drill - tabletop exercise with PC, Captains and Chief Officer.

10:30 - 11:10

Audit/Inspection/Training/Safety . [HSE]

JSA and Incident Report Training Module by PGS HSE Adviser.

November 6th, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)

Fuel Usage: 15 Cubic Metres - Survey Total = 217 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sighting. STOP Card Details Plotter in Nav Pros. Office is set up high on the bulkhead. To change Paper/pens will require to climb on desk. Not a good idea, especially in this weather. Plotter needs to be mounted lower on the bulkhead as they are designed for below eye level use. Fire blanket missing. Found one used for a job. Fire fighting equipment should not be removed and used for other purposes. Returned to the designated area (pocket) and person using fire blanket educated with possible consequences. Location of dryers, Deck 3: Dryers are located behind the door. A person using the port one need to close the door. This puts him in position where some one opening the door can cause injury. Dryers need to be located on bulkhead above ironing board. Washing machine, Laundry Deck 2: With ship rolling badly one machine sliding from bulkhead to bulkhead. Called seamen who lashed machine temporarily. Machine requires to be restrained in fixed position. Amazing this has not been seen before.

HSE Items:

Stop Card Issued - 4 issued.

10:30 - 11:15

Audit/Inspection/Training/Safety . [HSE]

PGS HSE Management Refresher Training concerning PTW, Lockout/Tagout and the PGS Drug and Alcohol Policy

13:20 - 13:30

Toolbox Meeting/Debrief [TB]

Toolbox meeting prior to launch for repairs to streamer 3.

13:34 - 14:10

Work Boat [WB] - 4 occupants

Boat launch to check possible bad section in streamer 3, replace and clean programme plugs.

16:50 - 17:00

Toolbox Meeting/Debrief [TB]

Meeting to discuss and clarify forthcoming streamer operations.

17:13 - 18:55

Work Boat [WB] - 4 occupants

Streamer maintenance and inspection of streamer 4 - change modules 6 and 7.

November 7th, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)

Fuel Usage: 17.69 Cubic Metres - Survey Total = 235 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sighting STOP Card Details The starboard side aft hinge of the top hood on the Engine of the work boat is broken. The screen on the Bridge PC was so blurry and distorted that I could not read the set up properties. People were still working with this everyday. Management (here Maritime/DMNG needs to provide a minimum number of spars to avoid such problem).

HSE Items:

Stop Card Issued - 2 issued.

01:53 Hazard Report [HR] - Report #PGS153
Fire extinguishers on the Port side should display correct inspection dates even though they are still valid.

01:54 Hazard Report [HR] - Report #PGS154
ID Tags should be placed on emergency switches e.g winch stop button should show "Push for Emergency stop of winch"

10:30 - 11:15 Audit/Inspection/Training/Safety . [HSE]
HSE Safety Training - Environmental Management

November 8th, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)

Fuel Usage: 13.96 Cubic Metres - Survey Total = 249 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sighting. STOP CARD Details QC Department moved all tape drivers out of their working area into separate room. Very high frequent noise source (copy tape drivers) placed next to observers desk. Observer's sitting next to this noise source for 12 hours each shift. Tape drives should be moved or at least mounted into a proper rack, same as recording tape drives or better. Diesel Compressor emergency shut down buttons are located in Diesel Compressors Room. In case of thick smoke or fire in this room or if access is impossible for some other reason, we have no chance of shutting down these units. It is necessary to arrange additional emergency buttons somewhere outside Diesel Compressor room.

HSE Items:

Nothing To Report

November 9th, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)

Fuel Usage: 18.4 Cubic Metres - Survey Total = 267 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard. Whale watches have been maintained - no sighting STOP Card Details Extremely slippery galley deck. Especially when wet. Mention to catering to use caution. Approached Safety Officer, Bosun, Mate to source. Extra non slip product to be place on deck as when vessel rolls extremely dangerous. Person using fingers to lift salad food & replacing unwanted food in press.

HSE Items:

Stop Card Issued - 2 issued.

09:30 - 10:30 Audit/Inspection/Training/Safety . [HSE]
STOP Card training for Russian personnel

13:00 - 13:30 Fire Drill [FD]
Fire Drill and Emergency Evacuation training.

13:30 - 13:45 Toolbox Meeting/Debrief [TB]

13:45 - 14:30 Debrief after fire drill.
Safety Meeting [SM]
General Crew Safety Meeting

November 10th, 2003

Crew Number: 60 (Marine = 35; Seismic = 22; Contractor = 3)
Fuel Usage: 18.03 Cubic Metres - Survey Total = 285 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard.
Whale watches have been maintained - no sighting

HSE Items:

10:20 - 10:35 Toolbox Meeting/Debrief [TB]
Toolbox Meeting prior to TS Dip and boat launch.
10:43 - 11:11 Work Boat [WB] - 4 occupants
TS Dip and collect package from the Perfect Lady

November 11th, 2003

Crew Number: 57 (Marine = 32; Seismic = 22; Contractor = 3)
Fuel Usage: 7 Cubic Metres - Survey Total = 292 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard.
Whale watches have been maintained - no sighting

HSE Items:

Nothing To Report

November 12th, 2003

Crew Number: 57 (Marine = 32; Seismic = 22; Contractor = 3)
Fuel Usage: 5 Cubic Metres - Survey Total = 297 Cubic Metres.

Comments:

No accidents or lost time incidents reported. No spillage of oil or loss of containment overboard.
Whale watches have been maintained - no sighting

HSE Items:

Nothing To Report

7.0 DAILY PRODUCTION LOG**7.1 DAILY PRODUCTION LOG**October 25th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
001	WO3ANT-1116P1	125.0	Prime	Scratched	0	0	0.00000
002	WO3ANT-1116P2	125.0	Prime	Incomplete	1782	2944	21.80625
003	WO3ANT-1156P1	305.0	Prime	Completed	2836	893	36.45000
004	WO3ANT-1108P1	125.0	Prime	End of Day	1001	2182	22.16250
Total 10/25/2003 :							80.41875

October 26th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
004	WO3ANT-1108P1	125.0	Prime	Completed	2183	2944	14.28750
005	WO3ANT-1148P1	305.0	Prime	Completed	2836	893	36.45000
006	WO3ANT-1036P1	126.0	Prime	Completed	1001	2944	36.45000
007	WO3ANT-1140P1	305.0	Prime	Completed	2836	893	36.45000
Total 10/26/2003 :							123.63750

October 27th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
008	WO3ANT-1100P1	125.0	Prime	Completed	1001	2944	36.45000
009	WO3ANT-1132P1	305.0	Prime	Completed	2836	893	36.45000
010	WO3ANT-1004P1	125.0	Prime	Incomplete	1022	2944	36.05625
011	WO3ANT-1124P1	305.0	Prime	End of Day	2836	2225	11.47500
Total 10/27/2003 :							120.43125

October 28th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
011	WO3ANT-1124P1	305.0	Prime	Incomplete	2224	1678	10.25625
012	WO3ANT-1124P2	305.0	Prime	Completed	1677	893	14.71875
013	WO3ANT-1012P1	125.0	Prime	Incomplete	1001	2944	36.45000
Total 10/28/2003 :							61.42500

November 1st, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
014	WO3ANT-1092P1	125.0	Prime	Incomplete	1100	2944	34.59375
015	WO3ANT-1164P1	305.0	Prime	End of Day	2813	1861	17.86875
Total 11/1/2003 :							52.46250

November 2nd, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
015	WO3ANT-1164P1	305.0	Prime	Completed	1860	893	18.15000
Total 11/2/2003 :							18.15000

November 3rd, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
016	WO3ANT-1012P2	125.0	N/C Reshoot	Completed	0	0	0.00000
017	WO3ANT-1260P1	305.0	Prime	Completed	2168	893	23.92500
Total 11/3/2003 :							23.92500

November 4th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
018	WO3ANT-1044P1	125.0	Prime	Completed	1001	2944	36.45000

019	WO3ANT-1172P1	305.0	Prime	Completed	2759	893	35.00625
020	WO3ANT-1020P1	125.0	Prime	Completed	1001	2944	36.45000
021	WO3ANT-1180P1	305.0	Prime	End of Day	2730	1356	25.78125
Total 11/4/2003 :							133.68750

November 5th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
021	WO3ANT-1180P1	305.0	Prime	Completed	1355	893	8.68125
022	WO3ANT-1052P1	126.0	Prime	Completed	1001	2944	36.45000
023	WO3ANT-1188P1	305.0	Prime	Completed	2658	893	33.11250
024	WO3ANT-1028P1	125.0	Prime	Completed	1001	2944	36.45000
025	WO3ANT-1196P1	305.0	Prime	End of Day	2634	2062	10.74375
Total 11/5/2003 :							125.43750

November 6th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
025	WO3ANT-1196P1	305.0	Prime	Completed	2061	893	21.91875
026	WO3ANT-1020I1	125.0	Infill	Completed	1001	1528	9.90000
026	WO3ANT-1020I1	125.0	N/C Reshoot	Completed	0	0	0.00000
026	WO3ANT-1020I1	125.0	Infill	Completed	1575	2238	12.45000
026	WO3ANT-1020I1	125.0	N/C Reshoot	Completed	0	0	0.00000
026	WO3ANT-1020I1	125.0	Infill	Completed	2282	2944	12.43125
027	WO3ANT-1196I1	305.0	Infill	Scratched	0	0	0.00000
028	WO3ANT-1196I2	305.0	Infill	End of Day	2598	2077	9.78750
Total 11/6/2003 :							66.48750

November 7th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
028	WO3ANT-1196I2	305.0	Infill	Completed	2076	893	22.20000
029	WO3ANT-1060P1	125.0	Prime	Incomplete	1231	2944	32.13750
030	WO3ANT-1204P1	305.0	Prime	Completed	2544	893	30.97500
031	WO3ANT-1068P1	125.0	Prime	Completed	1001	2944	36.45000
032	WO3ANT-1212P1	305.0	Prime	End of Day	2525	2453	1.36875
Total 11/7/2003 :							123.13125

November 8th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
032	WO3ANT-1212P1	305.0	Prime	Completed	2452	893	29.25000
033	WO3ANT-1076P1	125.0	Prime	Completed	1003	2944	36.41250
034	WO3ANT-1220P1	305.0	Prime	Completed	2478	893	29.73750
035	WO3ANT-1084P1	125.0	Prime	Completed	1001	2944	36.45000
Total 11/8/2003 :							131.85000

November 9th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
036	WO3ANT-1228P1	305.0	Prime	Completed	2425	893	28.74375
037	WO3ANT-1084I1	305.0	Infill	Completed	1001	2944	36.45000
038	WO3ANT-1236P1	305.0	Prime	Completed	2372	893	27.75000
039	WO3ANT-1116I1	305.0	Infill	Completed	1001	2944	36.45000
Total 11/9/2003 :							129.39375

November 10th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
040	WO3ANT-1180P2	305.0	N/C Reshoot	Completed	0	0	0.00000
041	WO3ANT-1196P2	305.0	N/C Reshoot	Completed	0	0	0.00000
042	WO3ANT-1244P1	305.0	Prime	Completed	2319	893	26.75625
043	WO3ANT-1116P3	305.0	Prime	Completed	1001	1781	14.64375

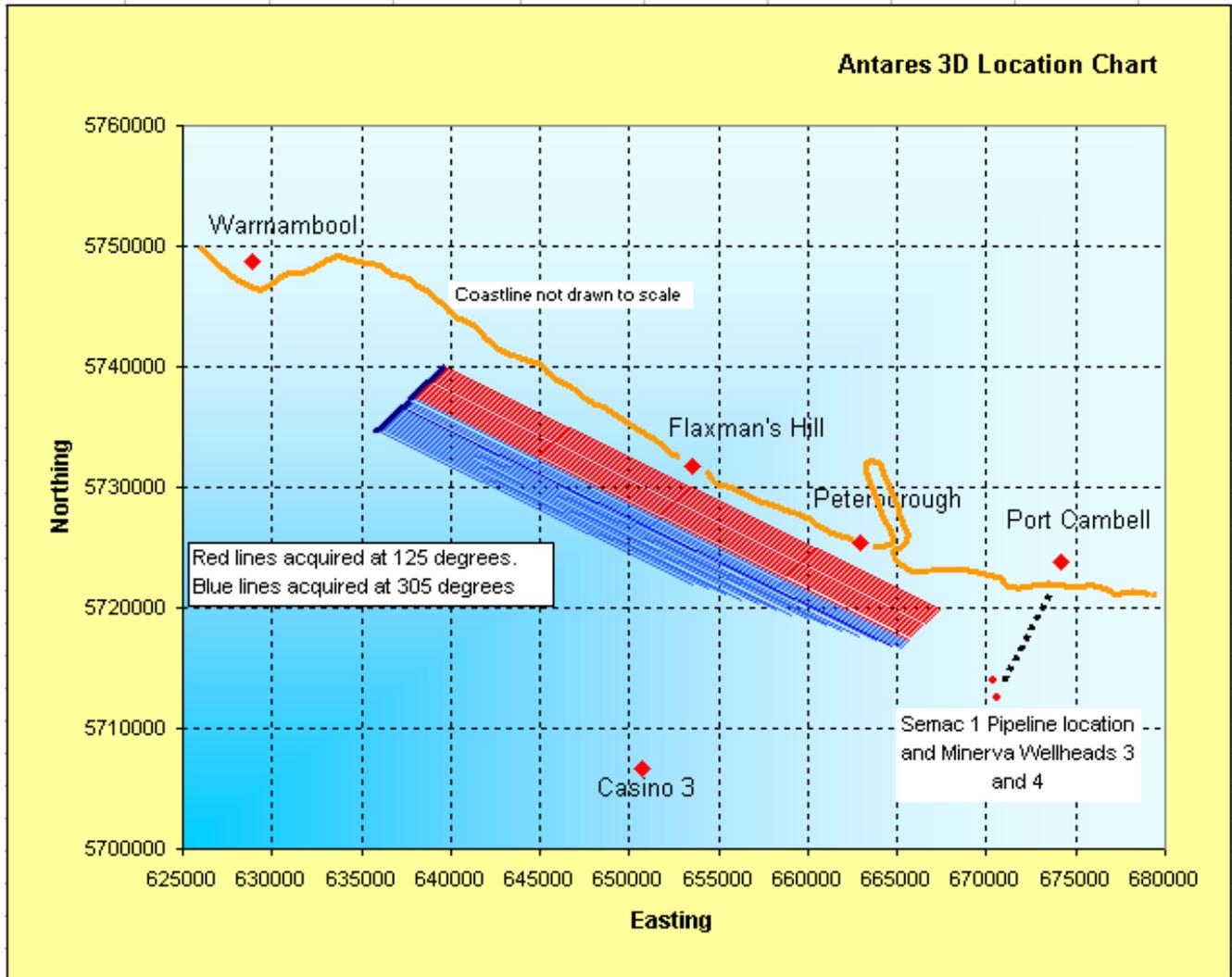
044	WO3ANT-1212P2	305.0	N/C Reshoot	Completed	0	0	0.00000
045	WO3ANT-1252P1	305.0	Prime	End of Day	2265	1569	13.06875
Total 11/10/2003 :							54.46875

November 11th, 2003

Seq	Line Name	Hdg	Line Type	Line Status	FcSP	LcSP	Ch Sailed
045	WO3ANT-1252P1	305.0	Prime	Completed	1568	893	12.67500
046	WO3ANT-1092P2	126.0	Prime	Completed	1001	1099	1.85625
047	WO3ANT-1092P3	125.0	N/C Reshoot	Completed	0	0	0.00000
048	WO3ANT-1252I1	305.0	Infill	Completed	2222	893	24.93750
049	WO3ANT-1060P2	305.0	Prime	Completed	1001	1230	4.31250
Total 11/11/2003 :							43.78125
Grand Total :							1,288.68750

8.0 APPENDICES

APPENDIX A: LOCATION CHART AND LINE ACQUISITION LAYOUT



Block Co-ordinates

Northing (metres)	Eastings (metres)
635788.17	5734696.87
639655.90	5740044.83
667520.90	5719892.46
665226.28	5716719.65
652701.69	5722464.78

APPENDIX B: SAIL-LINES AND BLOCK CO-ORDINATES

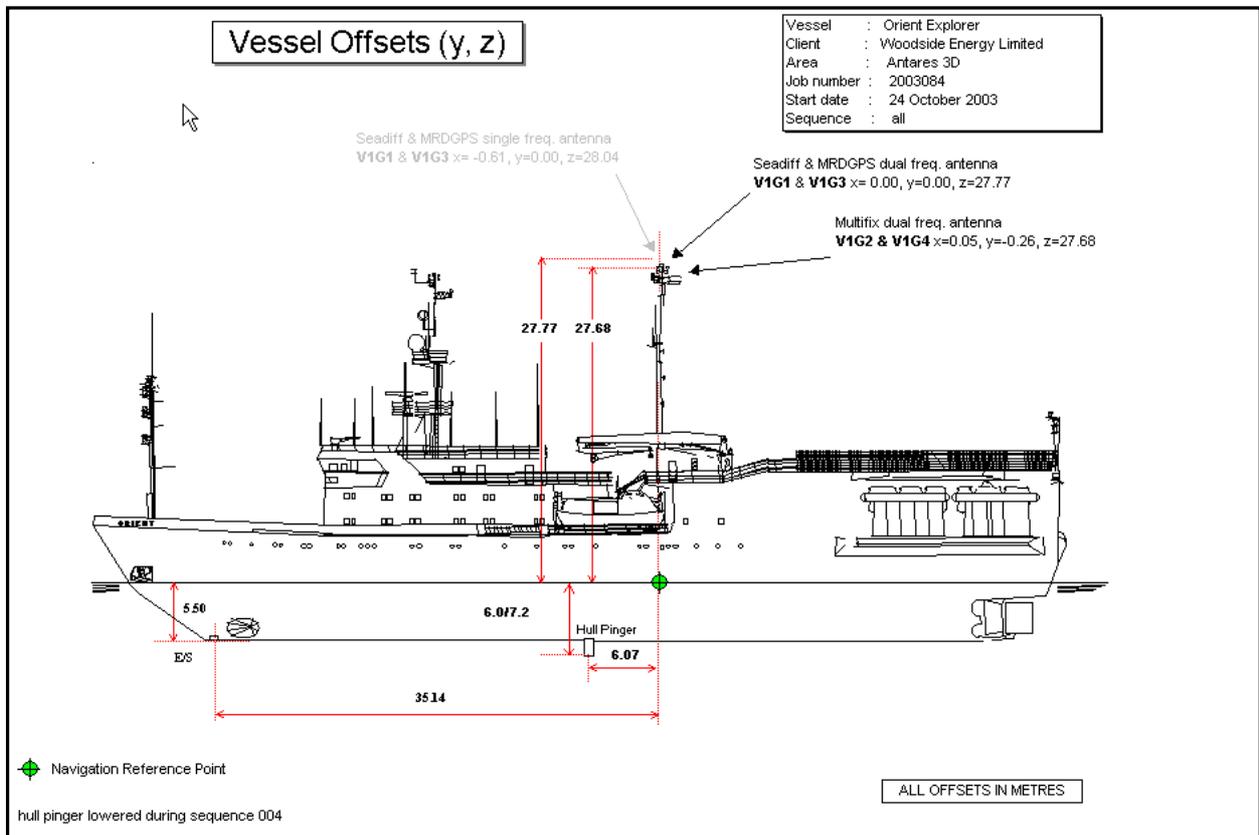
Line Name	Shot No	Easting	Northing	Metres
W03ANT1004	1001	639603.7	5739974.1	
W03ANT1004	2836	667483	5719811.4	34406.25
W03ANT1012	1001	639486.5	5739812	
W03ANT1012	2836	667365.8	5719649.3	34406.25
W03ANT1020	1001	639369.3	5739650	
W03ANT1020	2836	667248.6	5719487.3	34406.25
W03ANT1028	1001	639252.1	5739487.9	
W03ANT1028	2836	667131.4	5719325.2	34406.25
W03ANT1036	1001	639134.9	5739325.9	
W03ANT1036	2836	667014.2	5719163.1	34406.25
W03ANT1044	1001	639017.7	5739163.8	
W03ANT1044	2836	666897	5719001.1	34406.25
W03ANT1052	1001	638900.5	5739001.7	
W03ANT1052	2836	666779.8	5718839	34406.25
W03ANT1060	1001	638783.3	5738839.7	
W03ANT1060	2836	666662.6	5718677	34406.25
W03ANT1068	1001	638666.1	5738677.6	
W03ANT1068	2836	666545.4	5718514.9	34406.25
W03ANT1076	1001	638548.9	5738515.6	
W03ANT1076	2836	666428.2	5718352.9	34406.25
W03ANT1084	1001	638431.7	5738353.5	
W03ANT1084	2836	666311	5718190.8	34406.25
W03ANT1092	1001	638314.5	5738191.4	
W03ANT1092	2836	666193.8	5718028.7	34406.25
W03ANT1100	1001	638197.3	5738029.4	
W03ANT1100	2836	666076.6	5717866.7	34406.25
W03ANT1108	1001	638080.1	5737867.3	
W03ANT1108	2836	665959.4	5717704.6	34406.25
W03ANT1116	1001	637962.9	5737705.3	
W03ANT1116	2836	665842.2	5717542.6	34406.25
W03ANT1124	1001	637845.7	5737543.2	
W03ANT1124	2836	665725	5717380.5	34406.25
W03ANT1132	1001	637728.5	5737381.1	
W03ANT1132	2836	665607.8	5717218.4	34406.25
W03ANT1140	1001	637611.3	5737219.1	

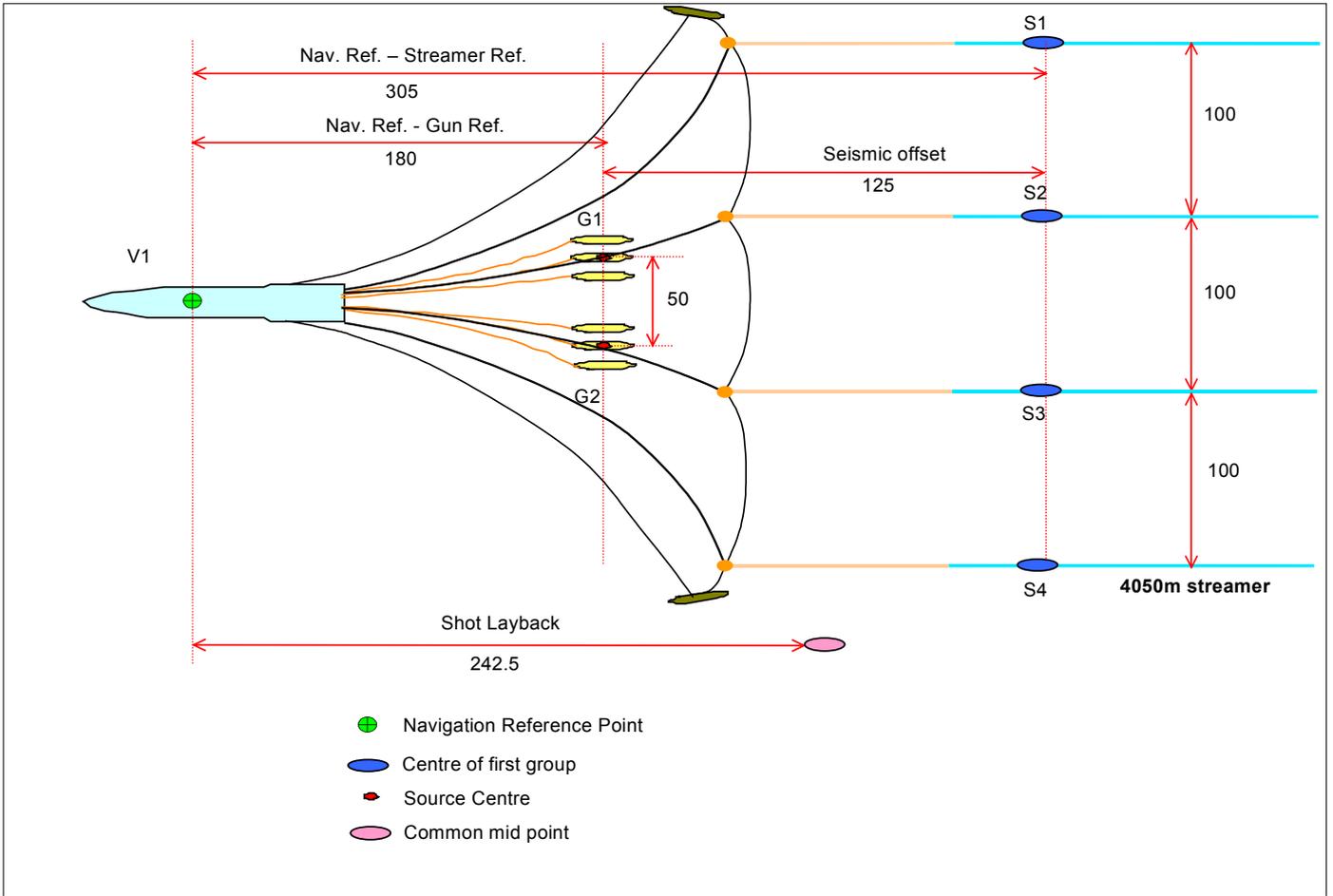
W03ANT1140	2836	665490.6	5717056.4	34406.25
W03ANT1148	1001	637494.1	5737057	
W03ANT1148	2836	665373.4	5716894.3	34406.25
W03ANT1156	1001	637376.9	5736895	
W03ANT1156	2836	665256.1	5716732.3	34406.25
W03ANT1164	1001	637259.6	5736732.9	
W03ANT1164	2813	664789.5	5716822.9	33975
W03ANT1172	1001	637142.4	5736570.8	
W03ANT1172	2759	663851.9	5717254.2	32962.5
W03ANT1180	1001	637025.2	5736408.8	
W03ANT1180	2705	662914.2	5717685.5	31950
W03ANT1188	1001	636908	5736246.7	
W03ANT1188	2652	661991.8	5718105.8	30956.25
W03ANT1196	1001	636790.8	5736084.7	
W03ANT1196	2598	661054.2	5718537.1	29943.75
W03ANT1204	1001	636673.6	5735922.6	
W03ANT1204	2544	660116.5	5718968.4	28931.25
W03ANT1212	1001	636556.4	5735760.6	
W03ANT1212	2491	659194.1	5719388.7	27937.5
W03ANT1220	1001	636439.2	5735598.5	
W03ANT1220	2437	658256.5	5719819.9	26925
W03ANT1228	1001	636322	5735436.4	
W03ANT1228	2383	657318.8	5720251.2	25912.5
W03ANT1236	1001	636204.8	5735274.4	
W03ANT1236	2329	656381.2	5720682.5	24900
W03ANT1244	1001	636087.6	5735112.3	
W03ANT1244	2276	655458.8	5721102.8	23906.25
W03ANT1252	1001	635970.4	5734950.3	
W03ANT1252	2222	654521.2	5721534.1	22893.75
W03ANT1260	1001	635853.2	5734788.2	
W03ANT1260	2168	653583.5	5721965.4	21881.25

Block Co-ordinates

Northing (metres)	Easting (metres)
635788.17	5734696.87
639655.90	5740044.83
667520.90	5719892.46
665226.28	5716719.65
652701.69	5722464.78

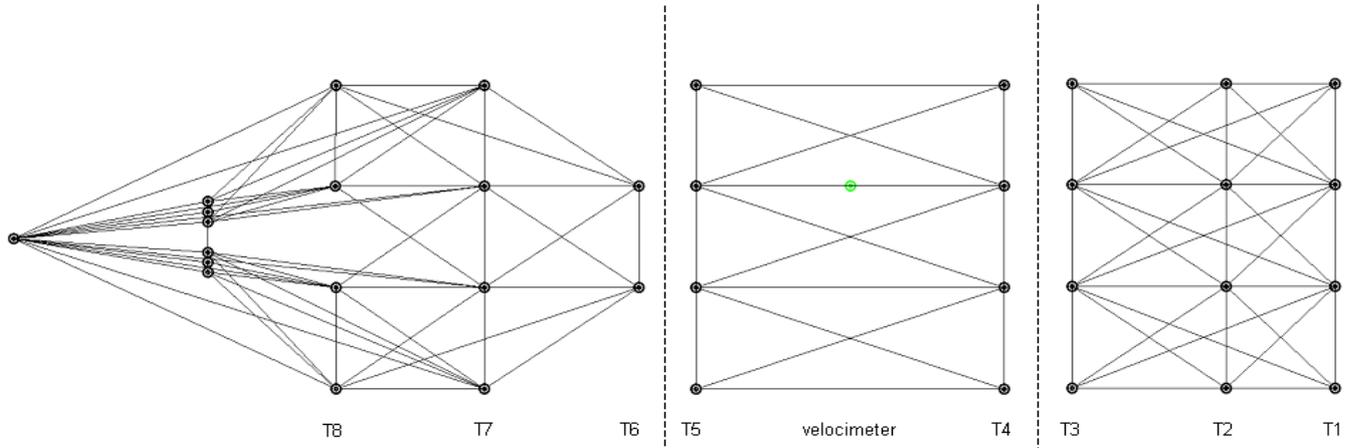
APPENDIX C: VESSEL AND STREAMER TOWING SETUP.



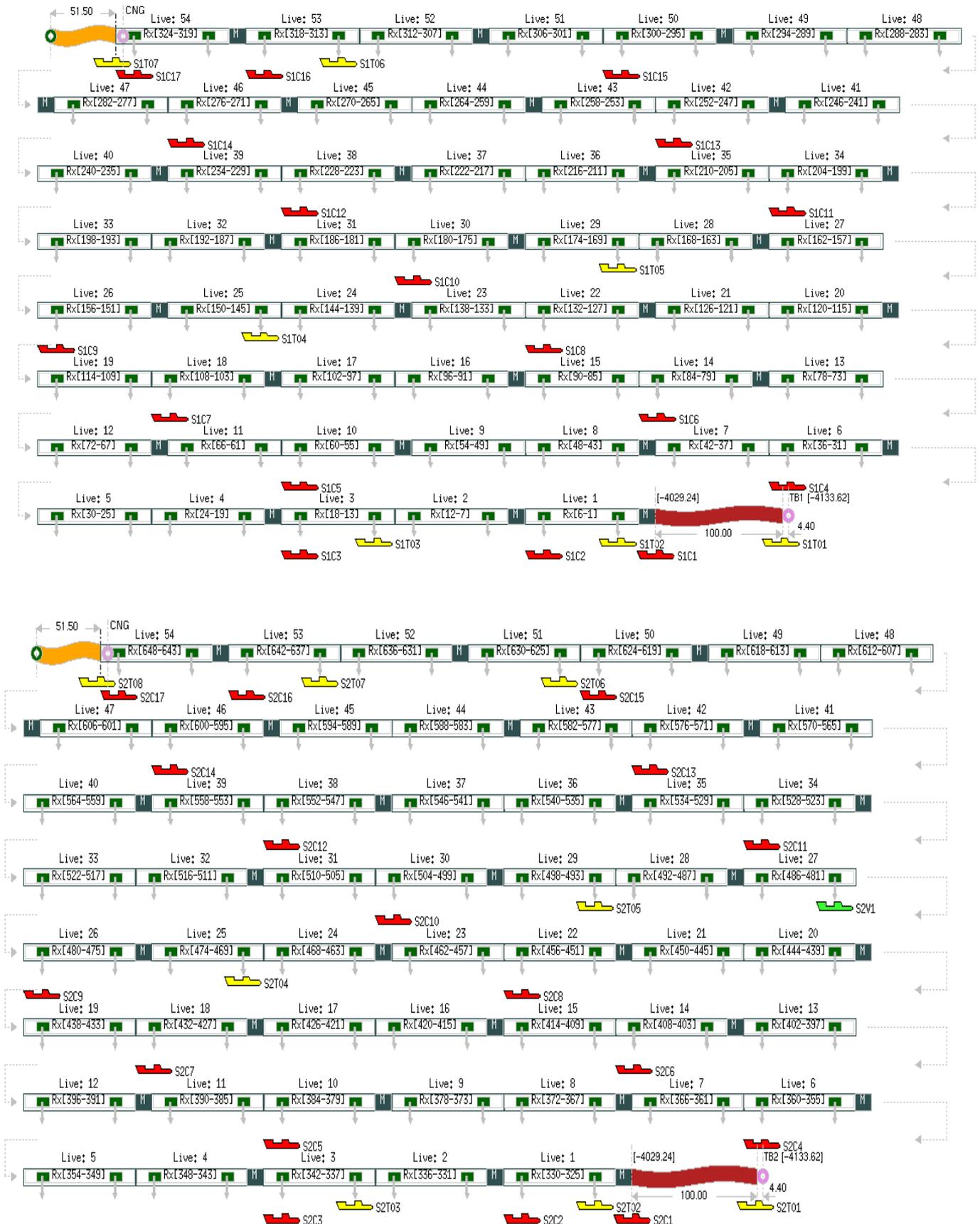


Acoustic Networks

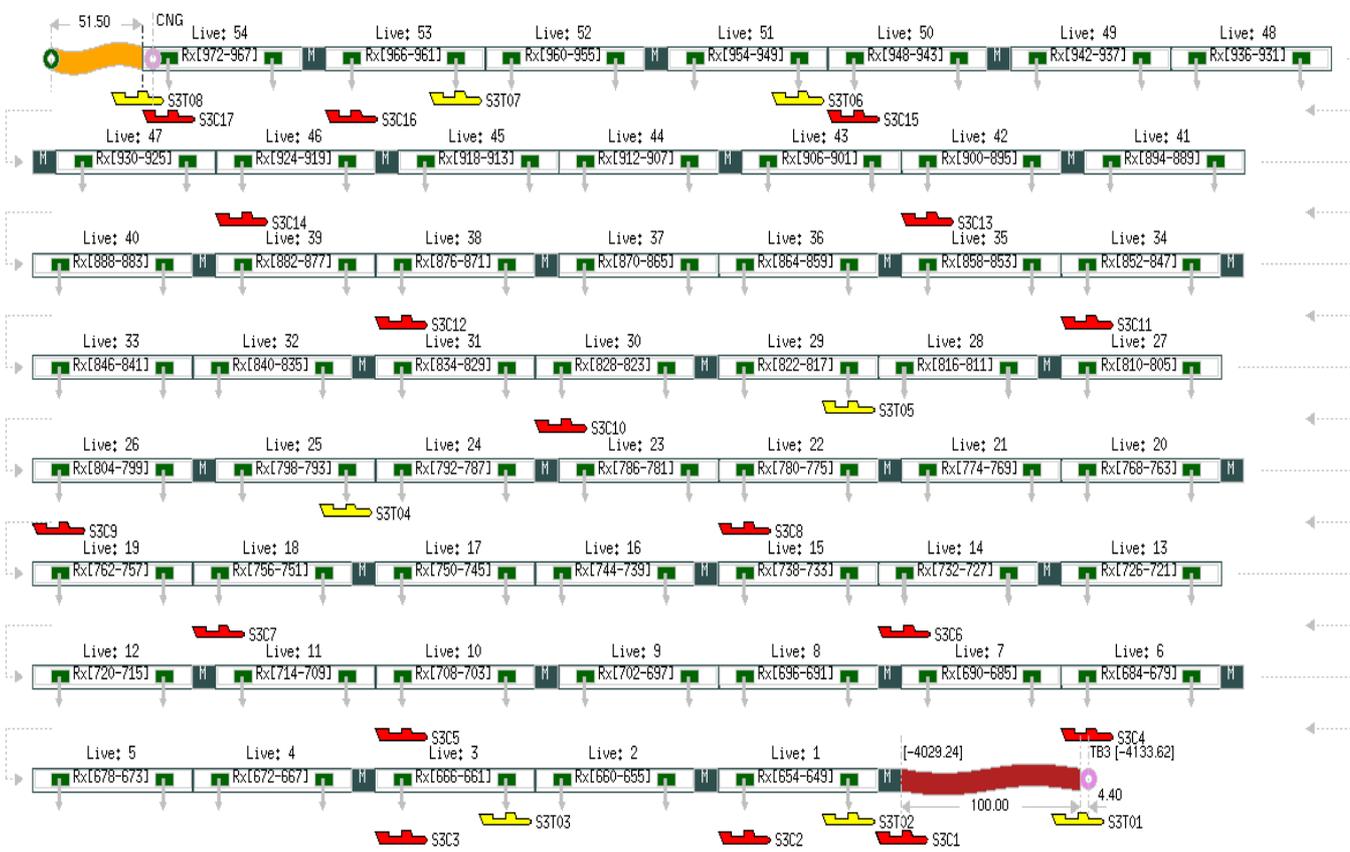
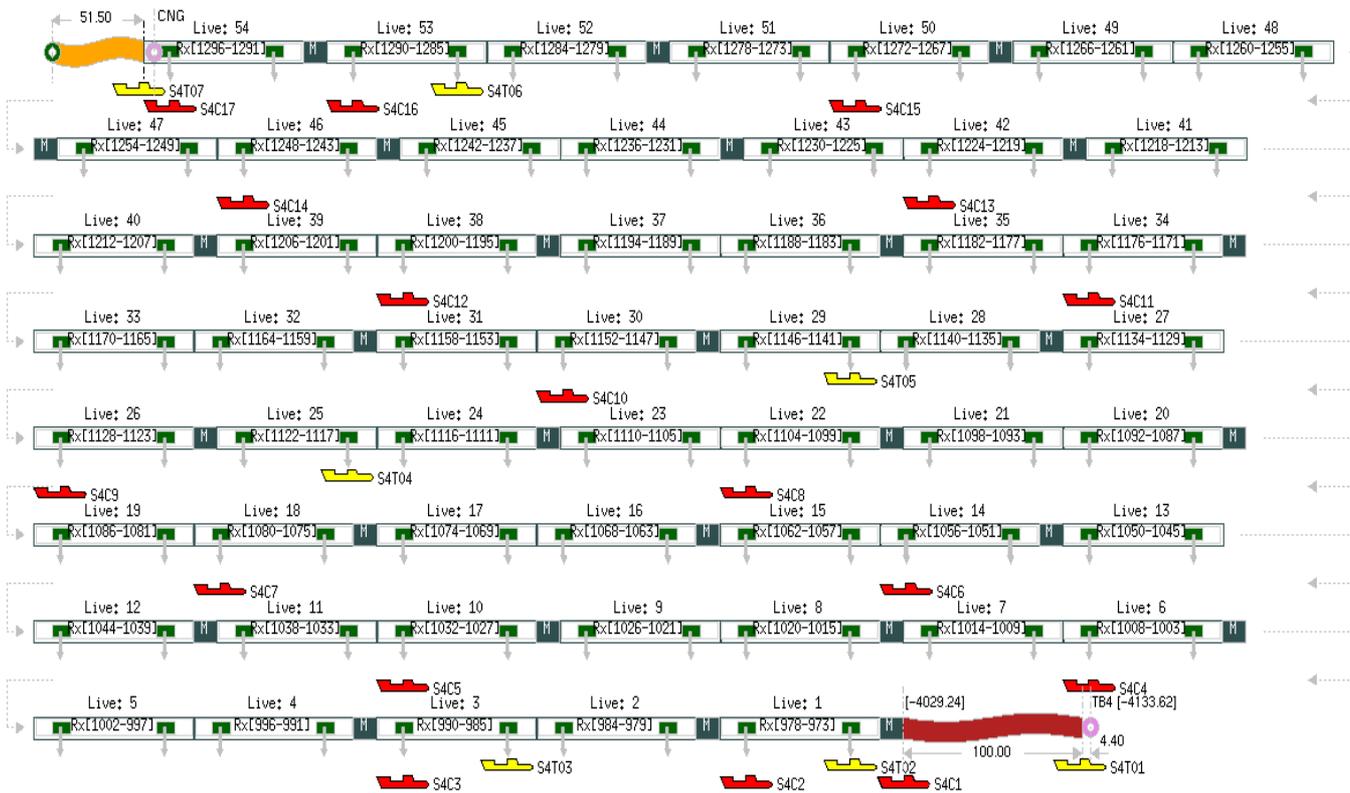
Vessel : Orient Explorer
 Client : Woodside Energy Limited
 Area : Antares 3D
 Job number : 2003084
 Start date : 24 October 2003
 Sequence : all



Streamers 1 and 2 Towing Configuration



Streamers 3 and 4 Towing Configuration



APPENDIX D: ARRAY DROPOUTS, DESIGN AND TIMING

Following are the supplied SIEP Source Drop-out tables used during the Woodside Antares 3D MSS 2003

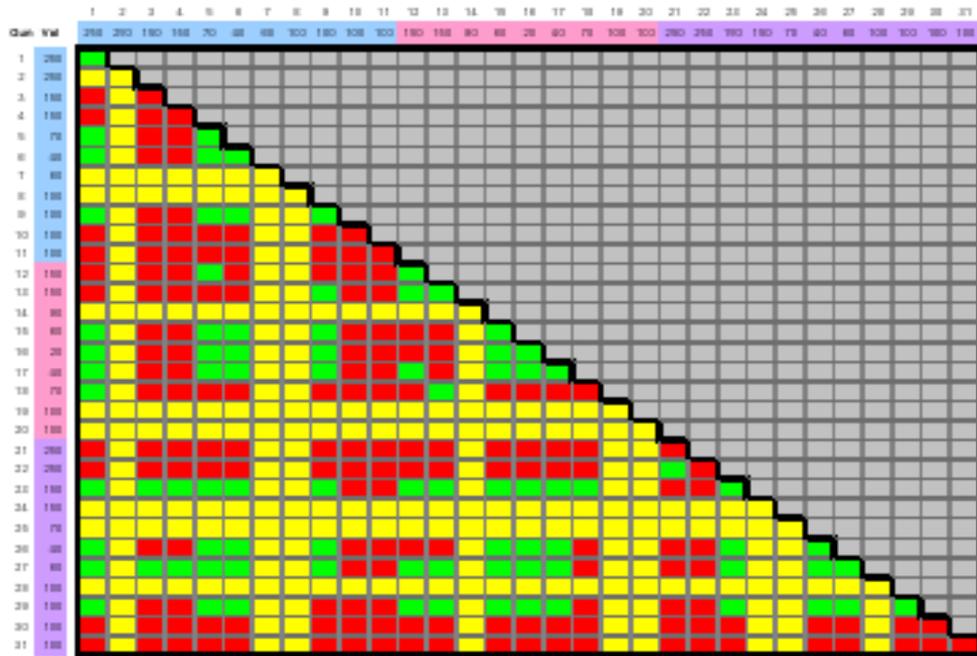
2-GUN DROPOUT ANALYSIS

Operating Unit :
 Contractor :
 Volume : 2500 cu. in.
 Depth : 6 m
 Pressure : 1800 psi
 Temperature :
 Active guns : 22
 Spare guns : 9
 Gun type 1 : Bolt 1500 C
 Gun type 2 : Bolt 1500 LL
 Gun type 3 :
 Sub-arrays : 3

2-gun dropout for 2500 cu. in. array
 Filter : Syntrak 900-24 : out - 268 Hz 270 dB/oct
 Spectral bandwidth : 90 Hz - 70 Hz
 (Borderline dropout combinations have been accepted)
 September 2003

Specifications	
TCF	
% PM	
array wtk	0.8838
PM wtk	18.00
avg dB	1.50
max dB	1.10

■ Allowed dropout
■ Illegal dropout
■ Spare gun



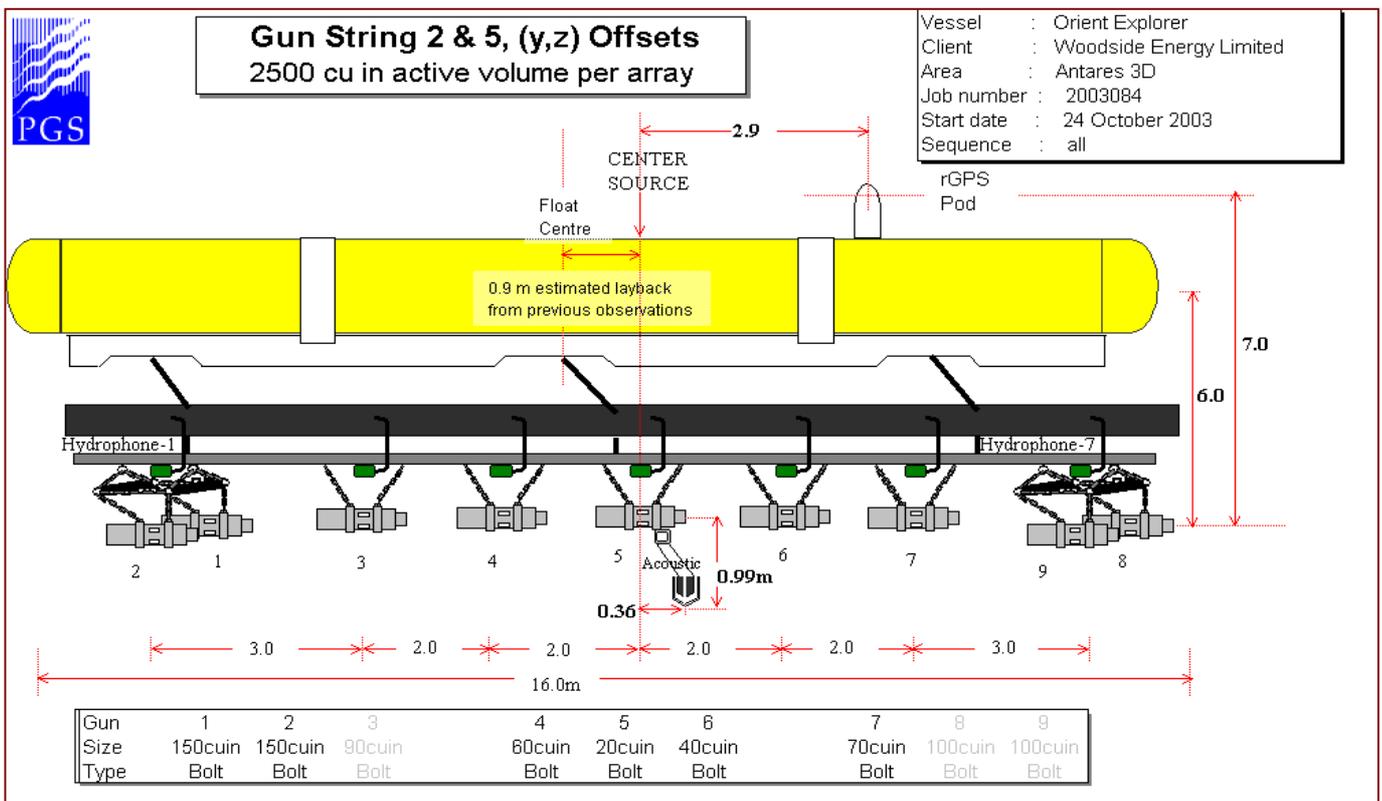
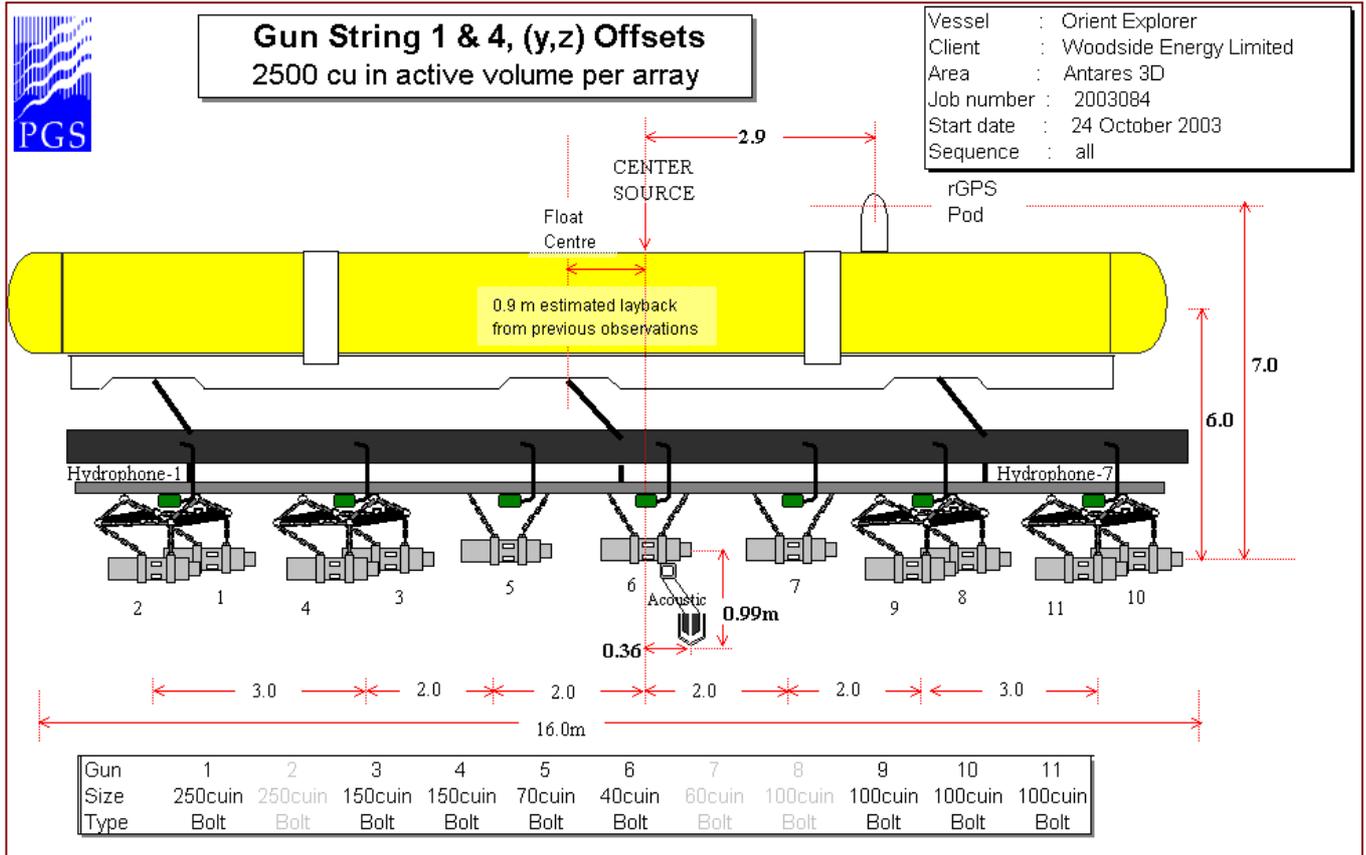
ARRAY LISTING

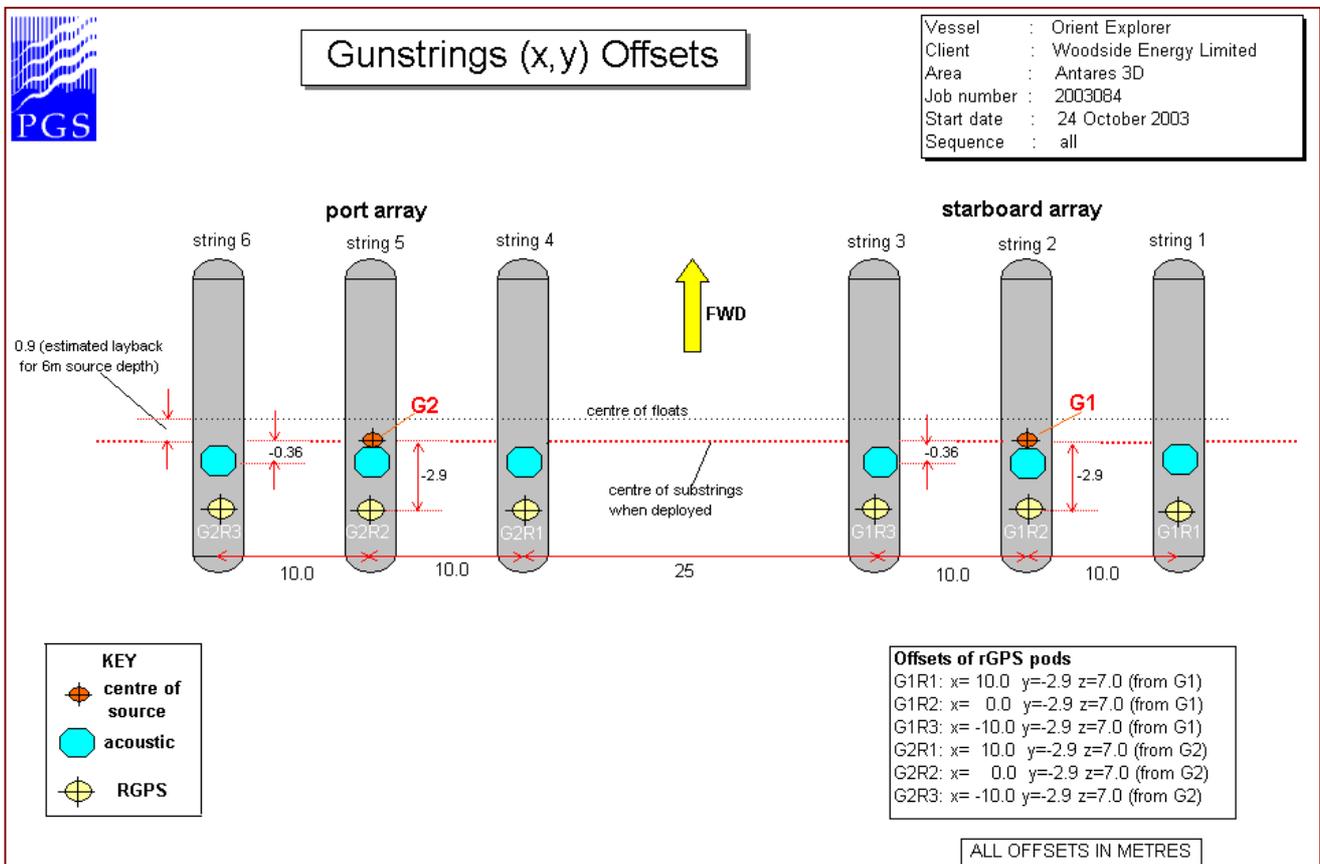
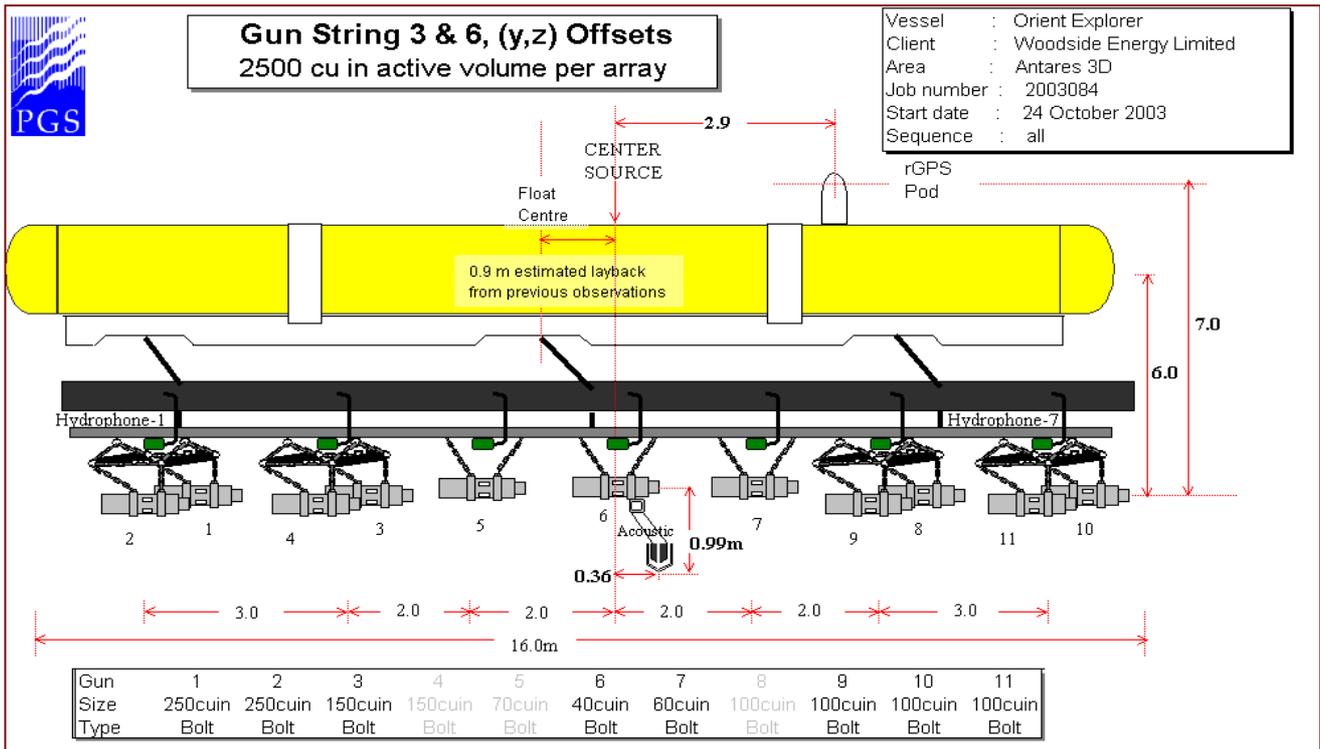
ARRAY NAME : 2500LB_60_1800_100
 NUMBER OF ACTIVE GUNS : 22
 TOTAL ACTIVE VOLUME : 2500 CU. IN.
 NUMBER OF SPARE GUNS : 9

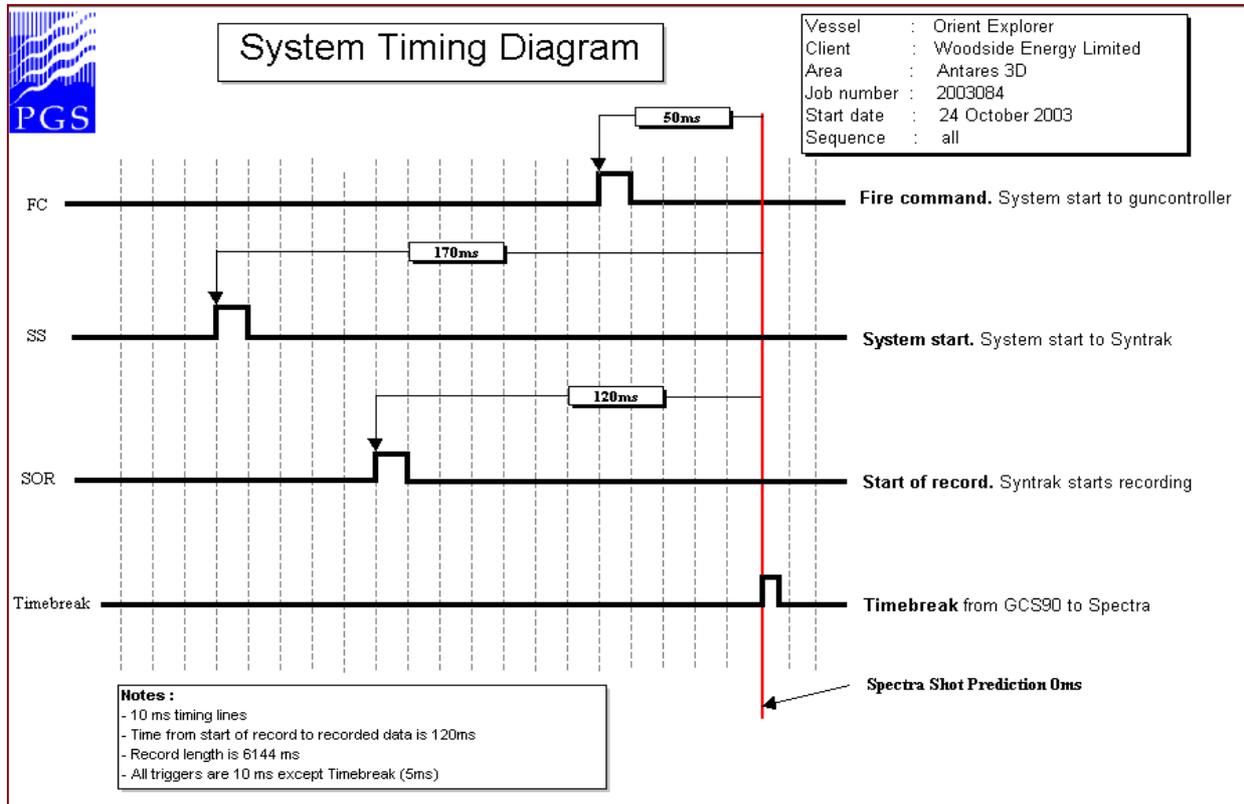
GUN #	GUN TYPE	X (m)	Y (m)	Z (m)	VOLUME (cu. in)	PRESSURE (psi)	WSK	DELAY (ms)	CLUSTER NUMBER
1	13	0.00	-10.40	6.00	250	1800	1.00	0.00	0
2	13	0.00	-9.60	6.00	250	SPARE	1.00	0.00	0
3	13	3.00	-10.40	6.00	150	1800	1.00	0.00	1
4	13	3.00	-9.60	6.00	150	1800	1.00	0.00	1
5	13	5.00	-10.00	6.00	70	1800	1.00	0.00	0
6	2	7.00	-10.00	6.00	40	1800	1.00	0.00	0
7	13	9.00	-10.00	6.00	60	SPARE	1.00	0.00	0
8	13	11.00	-10.35	6.00	100	SPARE	1.00	0.00	0
9	13	11.00	-9.65	6.00	100	1800	1.00	0.00	0
10	13	14.00	-10.35	6.00	100	1800	1.00	0.00	2
11	13	14.00	-9.50	6.00	100	1800	1.00	0.00	2
12	13	0.00	-0.40	6.00	150	1800	1.00	0.00	3
13	13	0.00	0.40	6.00	150	1800	1.00	0.00	3
14	13	3.00	0.00	6.00	90	SPARE	1.00	0.00	0
15	13	5.00	0.00	6.00	60	1800	1.00	0.00	0
16	2	7.00	0.00	6.00	20	1800	1.00	0.00	0
17	2	9.00	0.00	6.00	40	1800	1.00	0.00	0
18	13	11.00	0.00	6.00	70	1800	1.00	0.00	0
19	13	14.00	-0.35	6.00	100	SPARE	1.00	0.00	0
20	13	14.00	0.35	6.00	100	SPARE	1.00	0.00	0
21	13	0.00	9.60	6.00	250	1800	1.00	0.00	4
22	13	0.00	10.40	6.00	250	1800	1.00	0.00	4
23	13	3.00	9.60	6.00	150	1800	1.00	0.00	0
24	13	3.00	10.40	6.00	150	SPARE	1.00	0.00	0
25	13	5.00	10.00	6.00	70	SPARE	1.00	0.00	0
26	2	7.00	10.00	6.00	40	1800	1.00	0.00	0
27	13	9.00	10.00	6.00	60	1800	1.00	0.00	0
28	13	11.00	9.65	6.00	100	SPARE	1.00	0.00	0
29	13	11.00	10.35	6.00	100	1800	1.00	0.00	0
30	13	14.00	9.65	6.00	100	1800	1.00	0.00	5
31	13	14.00	10.35	6.00	100	1800	1.00	0.00	5

THE GUN TYPES ARE:
 13: BOLT 1500 LL
 2: BOLT 1900C

"WSK" IS THE RATIO BETWEEN THE PRIMARY VOLUME AND TOTAL CHAMBER VOLUME IN A BOLT 1500C GUN (TYPE 1) WITH WAVESHAP KIT







APPENDIX E: CREW LISTS

17th October to 29th October

	Family name						Expiry Date
	Given names	Rank	Sex	Nationality	Date of Birth	Seamen Book/ Document No.	of Travel Document
1	Defossez Luc	Master	Male	Belgian	30-Jan-46	EC248805	5-May-07
2	Phipps Timothy	Chief Mate	Male	New Zealand	2-Dec-37	N372648	3-Apr-08
3	Laurence Glen	2nd Mate	Male	Australian	28-Sep-52	E7569766	13-Oct-10
4	Mooney Patrick	Chief Engineer	Male	Australian	15-Jan-40	L4435099	19-Sep-13
5	Ready Bradley	1st Engineer	Male	Australian	11-Feb-74	L5532115	10-Jan-07
6	Grogan Kevin	2nd Engineer	Male	New Zealand	27-Apr-48	L667351	10-Jan-06
7	Deroko Zdenko	IR	Male	Australian	22-Jan-45	L8049968	14-Dec-09
8	Kearney John	IR	Male	Australian	18-Oct-51	L8565856	26-May-10
9	Simm Robert	IR	Male	Australian	18-Dec-70	L9987333	7-Oct-12
10	Brady Elliott	IR	Male	Australian	13-Feb-69	L9651972	13-Jun-11
11	Milyukov Alexander	Captain Adviser	Male	Russian	11-Jun-66	60No 2445299	23-Apr-07
12	Kovalishin Bogdan	Chief Mate Adviser	Male	Russian	18-Jan-73	60No 0908624	28-May-07
13	Gayevoy Vladimir	Chief Eng Adviser	Male	Russian	26-Mar-59	60No 0904708	30-Aug-06
14	Bobylyov Sergey	2nd Eng Adviser	Male	Russian	25-Jul-71	60No 2444638	18-Mar-07
15	Melnikov Oleg	Compr. Engineer	Male	Russian	29-Nov-59	60No 3786471	25-Mar-08
16	Mirkin Yuriy	3rd Engineer	Male	Russian	12-Nov-59	60No 2445998	26-Jul-07
17	Mironov Yuriy	Ch.Electrician	Male	Russian	14-Oct-61	60No 3415698	11-Dec-07
18	Kubarev Alexander	Boatswain	Male	Russian	21-Nov-58	60No 2878880	6-Aug-07
19	Burun Igor	Gun Technician	Male	Russian	5-Sep-61	60No 3415552	4-Dec-07
20	Pivovarov Vladimir	Motorman	Male	Russian	22-Oct-65	60No 2445459	26-Apr-07
21	Khon Dmitriy	Interpreter	Male	Russian	2-May-74	60No 0908991	7-Jun-07
22	Baczyk Michael	Chief Cook	Male	Australian	17-May-70	L3518381	9-Jul-12
23	Evans Shane	2nd Cook	Male	Australian	21-Jan-81	L8739448	25-Jul-10
24	Keegan David	Chief Steward	Male	Australian	13-May-60	E7010072	14-Jul-05
25	Curry Roy	Steward	Male	Australian	15-Mar-52	L9883057	3-Sep-11
26	Fauzi	Paramedic	Male	Indonesian	25-Aug-66	M667715	5-Mar-08
27	Barsiyants Rafael	Party Asst.	Male	Russian	29-Sep-55	44No 0415932	21-Mar-05
28	Anisimov Vladimir	Observer	Male	Russian	07-Jun-57	44No 0416191	27-Mar-05
29	Kovtok Konstantin	Observer	Male	Russian	1-Jan-58	44No 0414727	12-Jan-05
30	Putrenko Yuriy	Observer	Male	Russian	7-Jan-61	60No 2791745	25-Mar-08
31	Dunyashev Egor	Navigation QC	Male	Russian	20-Nov-75	60No 3931157	8-Apr-08
32	Yakushev Alexey	AG Mechanic	Male	Russian	26-Aug-75	60No 0901523	18-Jun-06
33	Shamin Alexander	AG Mechanic	Male	Russian	10-Sep-66	60No 2879013	26-Aug-07
34	Valeyev Maxim	AG Mechanic	Male	Russian	4-Jun-71	60No 3560393	28-Jan-08
35	Lotarev Valeriy	Navigator	Male	Russian	17-Jun-50	44No 0426045	8-Nov-05
36	Kharchev Alexander	Navigator	Male	Russian	9-Aug-60	50No 0233712	11-Dec-03
37	Beer Stephen	Party Chief	Male	British	20-Mar-62	093028853	7-Aug-12
38	Bar Udo	Chief Observer	Male	German	11-Mar-56	5680222667	20-Oct-12
39	Astvatsaturov Georgiy	Chief Obs. Trainee	Male	American	24-Nov-60	133206376	31-Oct-09
40	Davis Ian Mark	S/L Observer	Male	British	22-Sep-66	500274940	16-Sep-08
41	Pitcher Stephen	Chief Navigator	Male	British	27-Jun-64	500214007	13-Dec-06
42	Perkins Christopher	S/L Navigator	Male	British	27-Nov-68	500289836	18-Dec-08
43	Pandey Ashok Kumar	Chief Geophysicist	Male	Indian	21-Jan-60	Z15685362	26-Jun-05
44	Jenssen Dag Borre	Coxswain	Male	Norwegian	17-Nov-68	99L009030138	10-Feb-09
45	Goen Ole Johnny	Navigation Procc	Male	Norwegian	17-Mar-69	98K0146036	16-Mar-08
46	Benjamin Keetley	Navigation QC	Male	British	25-Oct-75	093090866	8-Jan-14
47	Karl Holkestad	Chief Gunnar	Male	Norwegian	27-Jul-58	99L018311338	28-Apr-09
48	Kenneth Lloyd Haig	ECL/Client	Male	Australian	6-May-46	L5444613	12-Nov-06
49	Stephen John Burt	EDR/Client	Male	British	12-Mar-55	740209240	20-Jul-11

29th October to 11th November 2003

1	Odlum Steve	Master	Male	Australian	10-Jun-56	E7549446	26-Jul-05
2	Turner Robert	Chief Mate	Male	N. Zealand	24-Dec-50	AA867535	9-Sep-13
3	Laurence Glen	2nd Mate	Male	Australian	28-Sep-52	E7569766	13-Oct-10
4	Riddle Jim	Chief Engineer	Male	N. Zealand	20-Jul-45	N505422	11-Dec-08
5	Terenowski , Mlaw	1st Engineer	Male	Australian	16-Jun-61	L5051556	23-Jun-05
6	Uszko Stin	2nd Engineer	Male	Australian	26-Jul-51	L8640938	7-Jul-10
7	Mansfield Steve	C. IR	Male	Australian	7-Aug-70	L3468398	21-May-12
8	Taylor George	IR	Male	Australian	21-Sep-39	J2058260	28-Feb-10
9	Udell Charles	IR	Male	Australian	22-Sep-59	L8083682	24-Dec-09
10	Thomas Tristan	IR	Male	Australian	16-Jul-79	L5809194	15-Aug-07
11	Renshaw , Chriser	HSE QA	Male	Australian	22-Feb-53	E7566140	11-Aug-10
12	Gutnik Vladimir	Captain Adviser	Male	Russian	15-Jan-52	MF-0027261	15-Feb-05
13	Pyryev Alexander	Chief Mate Adviser	Male	Russian	4-Jun-61	MF-0027061	21-Feb-07
14	Negoda Vladimir	Chief Engi. Adviser	Male	Russian	13-Jan-58	MF 0139535	23-Sep-08
15	Romanenko, R	2nd Eng. Adviser	Male	Russian	15-Nov-62	MF-0026963	2-Nov-05
16	Novak Oleg	Compr. Engineer	Male	Russian	14-May-62	MF-0027082	19-Mar-07
17	Novikov Alexey	Ch.Electrician	Male	Russian	7-Nov-60	MF-0027209	20-Dec-07
18	Bragin Nikolay	Boatswain	Male	Russian	10-Feb-50	MF-0027251	24-Feb-05
19	Malevanny Yuriy	Gun Technitian	Male	Russian	1-Mar-54	MF-0027074	26-Oct-05
20	Pivovarov Vladimir	Motorman	Male	Russian	22-Oct-65	60No 2445459	26-Apr-07
21	Kolodey Anatoly	Interpreter	Male	Russian	24-Nov-52	MF-0027100	9-Apr-07
22	Morgan Peter	Chief Cook	Male	Australian	22-Jun-61	L5703218	8-May-07
23	Ham Phillip	2nd Cook	Male	Australian	12-Jun-61	L8084375	24-Dec-09
24	Wood William	Chief Steward	Male	Australian	18-Feb-67	L8572287	31-May-10
25	Troy Kevin	Steward	Male	Australian	10-Dec-49	L3413108	6-May-12
26	Rantung Nixon	Paramedic	Male	Indonesian	20-Apr-72	M211447	7-Feb-07
27	Vavrovskiy , Alex	Party Asst.	Male	Russian	29-Jul-63	MF-0026871	12-Apr-06
28	Bashirov Rashid	Observer	Male	Russian	21-Sep-56	MF-0027314	24-Sep-08
29	Roshchupkin,, A	Observer	Male	Russian	28-Feb-55	MF-0148173	31-Jan-06
30	Bryzgalov Vladimir	Observer	Male	Russian	01-Oct-50	MF-0027312	24-Sep-08
31	Dunyashev Egor	Seismic Procc QC	Male	Russian	20-Nov-75	60No 3931157	8-Apr-08
32	Selyutin Stanislav	AG Mechanic	Male	Russian	22-Sep-57	MF-0027225	04-Feb-08
33	Podgursky , Alex	AG Mechanic	Male	Russian	10-Aug-51	MF-0027313	24-Sep-08
34	Kovalyov , Alex	AG Mechanic	Male	Russian	26-Jan-63	MF-0027257	29-Apr-08
35	Timofeyev Vladimir	AG Mechanic	Male	Russian	27-Sep-66	MF-0027311	24-Sep-08
36	Sharetskiy Alexyey	S/L Navigator	Male	Russian	9-Aug-48	MF-0027173	19-Sep-07
37	Leontyev Roman	Navigator	Male	Russian	7-Jan-74	MF-0027172	19-Sep-07
38	Jettestad Esben	Party Chief	Male	Norwegian	23-Dec-66	20039161	13-Jun-12
39	Beneke Werner	Chief Observer	Male	German	26-Feb-56	1674056199	22-May-06
40	Schmidt Herbert	S/L Observer	Male	German	5-Jul-63	1836089638	31-Jul-07
41	Weaver Geoffrey	Chief Navigator	Male	Canadian	6-Dec-67	BC199843	18-Dec-06
42	Henley Grady	S/L Navigator	Male	USA	2-Aug-56	085545649	25-Dec-06
43	Pratt Kevin John	Navigator	Male	British	3-Mar-69	093101054	21-Jul-13
44	Ramsdal O.Gunnar	Coxswain	Male	Norwegian	20-Jul-63	00-L0738368-34	27-Nov-10
45	Cormack Kenneth	Navigation Proc.	Male	Australian	10-Jan-48	E7578508	01-Mar-11
46	Alleman Guy	Chief Geophysicist	Male	Belgian	28-May-65	EB584130	16-Jan-06
47	Jeffs Alfred C.	Onboard Geo.	Male	Australian	8-May-75	E7536624	15-Sep-08
48	Stoltz Patrick	Mechanic	Male	American	03-Jul-68	132823170	28-Jan-09
49	Kenneth Haig	ECL/Client	Male	Australian	6-May-46	L5444613	12-Nov-06
50	Stephen John Burt	EDR/Client	Male	British	12-Mar-55	740209240	20-Jul-11

APPENDIX F: MINUTES OF MEETINGS AND DRILLS

Subject: Woodside Antares 3D Survey Start up Meeting

Venue: M/V Orient Explorer, Galley Room

Time: 13:00 – 15:00

1.0 Meeting No.: 1 Date: 17.10.03

Total Marine:	Capt	Luc Defossez
PGS Crew:	Ori Pc	Stephen Beer
Ch Observer		Udo Baer
Ch Observer Trainee		Georgiy Asvatsaturov
Ch Navigator		Stephen Pitcher
CH Mechanic		Karl Holkestad
Ch. QC		Ashok Pandey
Safety delegate		Ian Davis
Navigation Processing		Ole Johnny Gjoen
DMNG Crew:	DMNG APC	Rafael Barsiyants
Orient Medic:Medic	Fauzi	

PGS HSE:	Asia Pacific HSE	Simon Byrne
PGS Perth:	PGS Australia	Nick David

Woodside Client reps:	Navigation	Stephen Burt
	Seismic	Ken Haig

Woodside Energy:		
Geo-Physicist		Mark Taylor
Project manager		Ralph Weiss
Co-ordinator	David O'Brien	
Geo-Physicist		Birgit Cropp
Environmental adviser		Peter Forrel
Environmental adviser		Jerry Maher

On behalf of Woodside Energy: DPI	Terry McKinley
-----------------------------------	----------------

Support Vessel Capt's: 'MV' Perfect Lady	John McKinnon
'MV' Southern Salvor	Bernard Commons

Mark Taylor (Woodside Energy) to open meeting, with all persons being present introduced.

Simon Byrne (PGS HSE) opening introduction & summarizing the 3D Antares survey Project plan:-

Survey area information (from pages 8 ~15 of the project plan) Topics included: - oilfield activity, Shipping activity, Sea conditions, Tides & currents, In sea Dangers, Time sharing, Fishing Activity (inc local sport & commercial/fishing Diving activity), Health, Medical Support / Medevac route, Weather, Environmental risks, Cetaceans, Oil spill response, Waste management, Security & Lobbyist Activity, Military Activity, Aircraft & Transportation, Vessel management Companies & Local shipping Agents, Emergency procedures Tel.no's (see page 15); Highlighted points below.

In the case of any Emergency Medi-Vac situations, the Local response teams have been informed of the survey & are aware of the Orients presence in the area, with all Heli-deck specs/ Technical data previously being supplied.

In the event of any Environmental issues or occurrences taking place, then Woodside Energy need to be informed within 2 hours of the event; They will proceed to inform the local authorities of any such event.

It is required that a cetacean monitoring log be performed by the Orient Bridge & passed onto the Orient Explorer PC.

An aerial survey of any cetaceans in the area must be performed prior to any seismic start up of the Guns, after the Survey area is declared all clear, only then may the seismic operations begin.

The Guns will go through a soft start-up procedure on initial start up (as per usual PGS & Orient Explorer practice), a small Gun (low cubic Capacity) will be in operation during line changes & during any other breaks in production shooting.

All seismic activity to cease at Midnight on the 31st November 2003.

Technical Information & Acquisition Data & Specifications :- (from pages 21 ~ 33 of the project plan) Topics included: Seismic data acquisition parameters, Miniature of preplot, Line names, shot numbering, Tape Numbering, Seismic & Navigation Deliverables, Data Shipment details, Positioning, Surface positioning, GPS coverage, Acoustic Network, Magnetic Compasses, Binning Grid, 3D Bin Coverage Specifications & Acoustic QC.

Introduction of Woodside Energy by Mark Taylor & Ralph Weiss

Ralph Weiss (Woodside Energy: - 3D Antares Project Manager) opening introduction, then outlining & summarizing the following Topics:- Contact No's for key personnel, Survey location, Facts & Figures, Survey & project Timing issues & HSE / Risk areas; Highlighted points below.

Inner sail lines will be required to be shot/surveyed during daylight hours in calmer sea's / favorable weather window conditions.

Survey Timing corresponds to both the Southern Wright Whale (Calf nursery grounds) & Blue whale migration patterns (1st Oct – 1st Dec), with both species frequently appearing in the area during these times.

The weather conditions are in a transition zone of the winter & summer regimes during the period of Oct – Nov.

There will be simultaneous operations close by & within the area, with Santos 2D seismic proposed for 15th Nov, BHP pipe lay vessel operations (Semac 1) from 22nd Oct – Nov & Woodside will also be performing Geo-Technical operations close by.

The BHP pipe lay vessel (Semac 1) being highlighted as the highest risk in terms of HSE to the Antares survey, with potential conflict of timing/ operational schedule issue areas foreseen.

Woodside have a 50-page document available to PGS PC/ Navigation depts, outlining restriction/operating zones related to the BHP chartered Pipe lay vessel (Semac 1).

Orient PC (Steve Beer) asked the Question:- whether the Infill lines can be shot against the Swath (Prime Line direction) ? ; Birgit Cropp (Woodside Energy 3D project Geo-physicist) Answered; "That it will be possible to shoot Infill lines in the opposite direction to the Swath (Prime line direction), should the need arise and the client rep approves this."

Introduction of Woodside Energy by Birgit Cropp (Geo-Physicist)

Birgit Cropp (Woodside Energy: - 3D Antares Project Geo-Physicist) opening introduction, then outlining history & Background information of Woodside Energy as a leading Australian Recourses company; Then summarizing the following Topics:-

Past & Current worldwide operations / projects.

Permit & Survey area background Issues by Mark Taylor (Woodside Energy Geo-Physicist)

Mark Taylor summarised the various permits required by Woodside Energy to complete the project including; Vic 37 (v) ~ State project approval (within 3 miles of the coast) together with the following topics.

Survey Objectives / boundaries & constraints including; 20m boundary line water depth limit, map structure, Survey completion expectations of ~ 2-4 weeks (allowing for 100 % downtime contingency).

Survey area background; A local Environmental beauty spot & sensitive ecological area, The area is known as the 'Shipwreck coast' for historical reasons, A slide was presented showing last year's weather windows highlighting how quickly storm force conditions can come in & how slowly they recede,

The area is a famous whale migration transition zone region for both the Southern Right & Blue whale species; the area is also renowned for various marine protected species such as 'Sea horses'.

Local 'Rock Lobster (Cray)' fisheries are operating in the region together with local commercial/Fishing Diving operations associated with Abalone fishing. A copy of the local operators & their co-ordinates of operation will be provided by Woodside Energy to the Orient Explorer PC & Navigation Depts.

Introduction by Peter Forrel (Woodside Energy Environmental adviser) of Environmental Constraints Policy; Then summarizing the following topics :-

Woodside Energy Environmental Policy statement to be provided so that it may be placed on the Orient Explorer Notice board.

It is all the crew's responsibility to adhere to the policy; the area of operation is within the boundaries of a Marine National Park protected zone.

It is thought between 5- 10 % of the local populations are employed directly within the fishing industry.

Potential Environmental Impacts foreseen; Air Guns (100 Hz- 1K kHz frequency range) within conflict hearing frequencies of the Great Whales.

Whale sighting procedures state: - Any whale sightings within 3 Klm's of the vessel then all Seismic Guns to be ceased (Australian Standard).

Ramping up /Soft starting procedures of the Seismic Gun's are to be adhered to during the initial Start up in the normal PGS / Orient Explorer manner.

Interference with Fishing activities in the region; 15th Nov the 'Rock Lobster' (Cray) fishing season begins again, local operators will be working within the vicinity area.

Waste Disposal; No food waste to be put overboard within the 2 Nautical Mile limit of shore, No waste to be disposed of overboard (in accordance with current PGS/ & Orient Explorer Practices).

Oil spillage & prevention; No refueling to take place at sea.

Reporting issues; Improvements can only be made when incidents & near Misses are reported & acted upon, all incidents are to be documented.

Introduction by Terry McKinley (DPI on behalf of Woodside Energy) Local opposition to the 3D Seismic survey; Then summarizing the following topics :-

Environmental sensitive issues; Greenpeace sensitive area (Historic area of Protest in 1992 ~ area of BHP Pipe lay barge operations) with Greenpeace pro-active measures in the past.

Woodside to provide Simon Byrne (PGS Asia/Pacific (HSE)) with details of previous pro-active Greenpeace measures.

Simon Byrne also reiterated the PGS policy of passive actions & tolerance against any such pro-active measures taken onboard any PGS vessels by any Environmental activist groups.

Negative Environmental press associated with the 3D seismic survey, alienation of such a survey of the public up to both State & Federal levels, with community issues & Environmental actions groups being involved.

The survey area is only 12 Km's from the International renowned '12 apostles National & Marine Park conservation area' (a Marine conservation Reserve) which has already had a 3D Seismic survey application refused.

HSE Policy & Summary By Ralph Weiss (Project Manager Woodside Energy).

Everybody has the right of responsibility to stop a job if they feel that it is in anyway 'un-safe'.

An overview of seismic survey HSE operations & performance by Woodside Energy in the period of 2000-2002.

HSE Commitments; The Emergency Response Telephone numbers to be tested within 24 hrs of the start of Survey.

All cetaceans' sightings to be logged.

All personnel on board to receive a Woodside Energy Induction training course.

What we at Woodside Expect; A safe operation; No Environmental conflicts/ damage to the Environment; Good seismic data on time; Quality results.

Quality results

Support Vessels; 'MV' Southern Salvor ~ to be used as a tow vessel (if required) a tug / tow test to be performed as soon as practical conditions allow.

'MV' Perfect Lady as chase boat; boat vessels are under the direction of the Orient Explorer

Survey to be shot in the central areas of the survey to begin with (PC & Captain to have ultimate decision); with Red (outer limit lines) Lines being shot in daylight hours.

Outer limit borderlines adjacent to the 'Santos border survey area' to be shot prior to the end of the survey.

Conflict areas with Sea Mac 1 (BHP pipe lay vessel); may require the Orient to turn off lines early; Communications between the 2 vessels is encouraged at the earliest possible stage to avoid where possible any such crossover with the BHP Sea Mac 1 pip lay vessel operation.

Woodside encourage the adoption of Step back 5 X 5 " Safety procedures card system" (along side with the PGS Stop card system).

HSE prize to both crews (Canon A70 Digital camera);- for the best adjudged contribution to HSE/ safety improvements.

End of Meeting

Subject: Woodside Safety audit recommendations meeting**Venue: M/V Orient Explorer, Mess Room****Time: 15:15 – 16:00****1.0 Meeting No.: 1 Date: 21.10.03**

Present:	DMNG	Capt (Adviser) Milyukov Alexander C. Eng Gayevoy Vladimir Interpreter Khon Dmitriy
	Australian	Capt Luc Defossez C. Eng Patrick Mooney
	PGS PC	Stephen Beer S/L Obs Ian Davis
	Woodside	Client Rep Stephen Burt Ken Haig

2.0 PC Steve Beer opening & explaining the purpose of the meeting, outlying the concerns, conclusions & recommendations list of the Woodside Maritime Audit.

3.0 Recommendations list & with action points #1 –16 (*'ed points are highest priority action items).

All Key signage is to be translated from Russian into English. Action item Completed.

Lithium battery locker requires signage for PPE & a Lithium extinguisher. Action item Completed.

3* The ER chemical store is to be reassessed – storage, signage, MSDS's, segregation & ventilation.

Action items: -

- I. Temporary solution already started. This involves partitioning the chemicals, and tidying the store. DMNG Ch.Eng to action; TotMar Ch.Eng to inspect. Target date: 23rd Oct.
- II. A written proposal to be submitted by Ch Eng as to the future stowage of the Chemicals on board. Target date: 23rd Oct.
- III. Proposals to include size of storage area required & adequate ventilation.
- IV. A point raised by the chief engineer was that Unitor ship these various chemicals together on the same pallet. This was interesting information. The Australian Ch.Eng said he would make enquiries to Unitor about this. Target date: 23rd Oct.

4 A regular internal audit of the vessels PTW procedures to be incorporated into the weekly schedule to assess the quality of permits issued & levels of compliance.

Action items: -

Captain's / PC / Ch.Eng:- all to discuss/ review 'The permit to work system' & why the current system failed. The best way to go about this needs to be decided. Target date: 29th Oct. It will take longer to get into action.

5 * Watertight doors (3) require clear directions for operating at the doors. The remote control for the frame 80 door requires signage identifying its location. *

Action items: - Dmitriy to make up signs in Russian and English. Oz Captain to inspect & act upon. Target date: 22nd October.

6 Hydrostatic releases on the two float free lifejacket boxes at the after end of the bridge deck have expired (2002) & require renewing.

Action items: -

DMNG Capt (adviser) to submit a set of written proposals (with consultation from Morton 'Nordic Maritime' if necessary) of what action they intend to take. Replace with spares, order spares, whatever. Write it down. Target date: 23rd Oct.

7 Manual release wires for MOB liferafts (2x4 man) aft on gun deck require signs to indicate both what and where they are.

Action: PC/ Gun Chief. Target date: 23rd Oct.

- 8 * All chemicals on board to be rationalised, stowed correctly and removed from inappropriate containers – eg water bottles.**
PC/dept ch's to be responsible for seismic areas; Captain/dept ch's to be responsible for maritime areas. Target date: 29th Oct.
- 9 * Education campaign on chemical management to be undertaken.**
Although this is highlighted as a priority point, time is needed to select the best way to do this. PC to discuss with PGS office. DMNG Captain advisor to discuss with Nordic Maritime/ DMNG. (The Oz Capt stated that there were videos and CDs available with suitable material on for this, and that you could get lists of what chemicals could be stored together safely). Results of these talks in writing by 27th Oct.
- 10 * Gear register to be reinstated and kept up to date to reflect what is on board – ie slings, shackles, etc – any certificate and when it was last inspected by a competent person. This should include jackets worn when at the stern of the gun deck.**
PC/Ch Gunner to explain to the DMNG gunners the importance of keeping this register up to date. Target date: 24th Oct.
- 11 Instigate a system to ensure appropriate industry safety alerts are received on board and distributed – the last one found was from 1997.**
This is a point that the PC wishes to pass on to PGS office. "Industry Safety Alerts", what exactly is meant here? If it is safety alerts from the whole offshore industry, then we can end up with too many alerts that are not relevant to seismic on a boat. If it is from the seismic industry, then we are getting company alerts passed to us from the office already (experience transfers), and these are duly discussed at safety meetings, posted on the notice boards and e-mailed to people onboard. However, we do not keep these paper copies filed. People do not read through old alerts for light reading. Both crews are made aware of the alerts and then these are removed from notice boards, when the next one comes in. All experience transfers are filed on computer and available for viewing. Alerts from other seismic companies would be most welcome.
- 12 * General housekeeping – the vessel has a number of lockers with an array of cardboard boxes and other items. These represent an unnecessary fire hazard.**
PC/Captain to get dept chiefs to tidy their areas. Client to inspect. This may need a few repeat goes to get things stowed to everyone's satisfaction. Storage space is at a premium on here. Target date (for 1st inspection): 26th Oct.
- 13 Four line throwing rockets in the appropriate box on the monkey island are out of date (2002) and to be disposed of next time in port.**
Capt/Capt advisor to state when this will be done. Target date: 24th Oct.
- 14 Re-write lifeboat launching instructions in English for simple use and repaint associated ball valves.**
Captain to ensure that Dmitriy writes instructions, and that bosun paints the valves. Captain to inspect and sign off. Target date: 27th Oct.
- 15 Undertake a signage audit to determine which signs require translation into English, what are missing – eg PPE signage at drill press – and what need renewing.**
We need to discuss how best to go about this, so that we don't miss any. Capt/PC to discuss at a later date. No date set right now for this, as there is already a lot on our plate, and in truth, this will probably be passed onto the oncoming crew to deal with.
- 16 * HV switchboard in ER CR – supply appropriate PPE & equipment as per SOLAS 11-1 Reg 45**
Captains and ch Eng's to put in writing when this will be complete, what action is to be taken, when ordered? When it will arrive? Target date: 24th Oct.

The PC raised the subject of welding without a ship's permit. The DMNG chief engineer accepts that this was incorrect. He did ask if the welders had a permit, but misunderstood that they only had the port authority permit, not the ship's one. He did personally check that fire watches were conducted, both below and above the work area, and that the job was carried out safely.

At the end of the meeting the PC made some very blunt statements about 1 or 2 issues, which will not be minuted.

Minutes of Meeting report

Subject: Safety Meeting

Venue: m/v Orient Explorer, Mess Room

Time: 13:00 – 13:50

1.0 Meeting No.: 047-03-16 **Date:** 25.10.03
03ORX16

Present: All crew except those on duty, namely:
2nd mate, 1st eng, nav, obs, gun,

4.0 Review of previous meeting held on 03.10.03.

3.0 Action items outstanding from previous meetings

03ORX01 AFT Mast Condition

This item is re-opened because after rectifying, some problem still exists. It is much better now but still not convenient to climb the mast for doing maintenance. Something to be done additionally. Procedure changes may be added to aloft JSA.

18.04.03: No proposals were passed on. Therefore, the chief navigator has looked at the railings, and agrees that there could be some improvement here. The chief navigator will produce a simple drawing in word, to be passed to the captain, which will show how these railings can be improved. (The railings must not restrict the crane's movement to port any more than now. Otherwise, the rails will be bent again when loading stores). After agreement onboard, this drawing will be sent to DMNG/Nordic Maritime (cc'ed to PGS Singapore) for approval. Then the rails can be modified when we are next alongside in Singapore.

09.05.03: Nordic Maritime say that this is to be paid for by PGS. However, this is still not clear. This topic is handed over to the other crew to sort out with Singapore during the transit.

06.06.03: There was not enough time for this job to be carried out in Singapore. It should be noted that there is more chance of getting work done if proper preparation is carried out. I.e Job specification, pictures etc. sent to company requested to carry out the work. In this particularly case, steel fabrication and scaffolding is required.

12.07.03: Okay, so something is required to be pre-fabricated. The measurements for this need to be taken by the same person that is going to do the work, probably Choy. Otherwise, there is too much potential for mis-understanding and errors. Measurements to be taken by Choy (supervised by ch. Nav) next time Orient is in Singapore. Actual alterations to be done, whenever we are in Singapore for long enough.

23.09.03: This was planned for Singapore. However, as we are unable to get into Loyang, we will be going alongside at Keppel Singmarine shipyard. Therefore there is next to no chance of getting the work by Choy's people, who have the bits prepared (the yard do not like outside contractors doing their work). We do not want the yard to do this work, Choy's people understand what is needed not to restrict the crane movement. It is best to wait until we come through Singapore again, which hopefully will be when we re-supply before going to India.

03.10.03: The bits were not pre-fabricated. Choy's men have measured up in Singapore, so they can provide a quote and a time scale to do the job.

25.10.03: Quote has been received and passed to the office.

Action Party : Ch. Nav/PC

Action Point: To improve aft mast railings

Status : Open

Target date : Next Extended Port Call

03ORX14 A lot of the hard hats are old and battered. Can some more be ordered.

20.06.03: To be ordered Pusan

11.07.03: These have been ordered and will be received in Pusan.

12.07.03: These hats did not arrive in Pusan. Ch. Gunner to investigate. It seems that these hats were never ordered for some reason. Chief gunner to order now.

05.09.03: Ch. Gunner has made an order, and now we are waiting for new hats.

23.09.03: These should arrive in Singapore.

03.10.03: On checking the orders, the hats were removed from order #336A, as they will be ordered from a supplier who has the company logo. Fine, but have they actually been ordered now? PC will check with Rolf Melhus.

25.10.03: Finally these hats have been ordered, #402A

Action Party : PC/Gun

Action Point : Order new hard hats

Status : Open.

Target Date : October 31st.

03ORX15 Newly received quick couplings for air and kerosene hoses are wrong size and leak (stop).
12.07.03. Later, we were informed that the couplings were not the wrong size, but were corroding. So stainless steel ones were ordered and received in Pusan. Now ch. Gunner says that the ones we received were not stainless but nickel plated. However, the problem is not corrosion at all. It is the fact that air fittings are being used for liquids (kerosene). Ch. Gunner to identify and purchase the right fittings for the job (stop).
05.09.03 An order for the right fittings has been made.
23.09.03: These should arrive in Singapore.
03.10.03: Arrived onboard in Singapore. These should be fitted soon, before next safety meeting.
25.10.03: Fitted.

Action Party : Ch. Gunner
Action Point : Purchase the right fitting for the job.
Status : Closed
Target Date : October 31st.

03ORX18 Workboat Radio

05.09.03 Work driver has ordered a new one. Whilst port call to Singapore we'll receive a new radio.
23.09.03: Captain to check that this order will arrive in Singapore. If this is not possible, then it needs to be followed up with more urgency to ensure we get the radio when we port call in Portland, before the start of the next job.
03.10.03: It sounds like this radio did not arrive in Singapore. Captain will check with Nordic Maritime, and will revert with status. It seems that the radio has not been ordered. This is a little frustrating, as the minutes of the 5th Sept say that the radio will arrive in Singapore, and the minutes of the 23rd Sept say that this will be checked upon. The captain is now looking into this.
25.10.03: This item seems to have been originally reported incorrectly in the minutes. It was the handset that was needed. However, a spare radio and 2 handsets has been ordered by the new Captain.

Action Party : Captain
Action Point : Order a new radio for workboat
Status : Closed
Target Date : Port call to Singapore

03ORX19 The pressure gauge in the accumulator for the workboat davit is broken. Ch. Eng said that a specialist has been ordered to fix this, and will come onboard this time in Singapore.

03.10.03: Ch. Eng says that parts were supplied in Singapore and this will be fixed soon.
25.10.03: Done.

Action Party : Ch. Eng.
Action Point : Get fixed.
Status : Closed
Target Date : 29th October.

03ORX20 T-card board is damaged, a new one is needed. This has been ordered, and should arrive in Singapore this time.

03.10.03: Arrived. Closed.
25.10.03: This is re-opened. The T-card board that arrived in Singapore is unsuitable for the job. Another one has been ordered by the DMNG Captain, and should be here at next port call apparently.

Action Party : Captain
Action Point : Source new T-card board.
Status : Open
Target Date : Singapore

03ORX21 STOP card. On the fwd mast 1 vertical bar on the cage that surrounds the ladder has come adrift and needs re-attaching. Also the bars are too far apart. The bosun will look at the fwd mast ladder to see what can be done. This is a maritime issue.

25.10.03: Again, weather and other work has prevented this being looked into. They will try to look at it when the weather next allows.

Action Party : Bosun/Capt
Action Point : Fix & propose improvements.
Status : Open
Target Date : 29th Oct.

4.0 Incidents since the last meeting

There have been 3 Incidents occurring on the transit to Portland since the last meeting:

ORI0314. One conjunctivitis of the eye –saw a doctor in Portland while alongside.

ORI0315. One absyys on eyelid –also saw the doctor in Portland.

ORI0316. Last night a crew member passed out on the chase boat, for about 30sec. He has been sent to hospital, where they could find nothing wrong with him. He is feeling fine, and will be sent up to Mount Gamber for further tests.

5.0 Drills since last meeting

Abandon Ship -1

Fire drill -1

Fire hose handling -1

6.0 New Business, STOP cards, Hazard register, etc.

6.3 During the transit to Australia, after the Oz crew have joined, the secondary muster point should be used for the 2nd drill, in order to make sure the routines are understood.

The new Australian Captain agreed that using the secondary muster for the next drill is a good idea.

25.10.03: :Done - closed

Action Party : Captain
Action Point : Familiarise Oz crew with secondary muster point
Status : Closed
Target Date: : 15th Oct.

6.4 **STOP card. The railings at the top of the aft mast are too low on the aft side.** The chief navigator should look into this, and come up with a proposal for improving the railings.

25.10.03: Due to the weather and the fact that things were very busy in the nav dept while alongside, this has not yet been started on.

Action Party : Chief Nav
Action Point : Propose improvements.
Status : Open
Target Date : 29th Oct.

6.6 **The chains on the lifeboat, used for holding the doors open, are rusting away.**

Bosun to fit new chains.

25.10.03: Done.

Action Party : Bosun/Capt
Action Point : Fit new chains.
Status : Closed
Target Date : 15th Oct.

6.7 There is a lot of bottled water stacked in the Norsat room. It was pointed out that this will fall over in the seas off Portland. Aus and DMNG bosuns to discuss best way of adding this to stack in heli-room, and making secure.

25.10.03: Done.

Action Party : Bosun/Capt
Action Point : Move and secure water bottles.
Status : Closed
Target Date : 8th Oct.

6.8 **The caps on three fire hydrants are too tight.**

The caps have been removed, but this is not a permanent solution. Without caps in sunny climates, the seals perish.

Action Party : Bosun/Capt
Action Point : Adjust caps so that they are not so tight.
Status : Open

Target Date : 30th Nov.

6.9 Washing machines in main linen laundry leaking.

Sponges were found under the machines to absorb the water, so obviously they have been like it for some time. There was some debate as to whether overfilling the machine might be to blame.

Action Party : Capt/Engineers.
Action Point : Investigate cause of leak.
Status : Open

Target Date : 30th Oct.

6.10 Removable ladder, port aft on gun deck has a bent base and no safety chain at the top.

Gunners to remedy.

Action Party : Ch. Gunner
Action Point : Fix ladder
Status : Open

Target Date : 30th Oct.

6.11 Workboat launching crew should be involved in the pre-launch toolbox meeting.

This has been done for the 2 workboat trips so far, and all agreed that it should continue for the rest of this job. However, there was some debate about whether this should become a standard practise for when we return to a purely DMNG maritime crew. This will be considered again then.

Action Party : PC/Capt
Action Point : Bosun and AB to be at pre-launch toolbox meeting.
Status : Closed

Target Date : 29th Oct.

6 Miscellaneous

The PC said that since the Australian crew had joined there had been a total of 27 STOP cards, 2 of which were positive ones, and action had been taken on nearly all of them. Well done to all.

The bosun asked the chief Eng where the granules were for the oil spill kit. the ch.Eng said that he would show him.

The PC said that the Woodside audit highlighted several things that needed attention on here, and these were being dealt with on a point by point basis. Rather than go through the audit now, the Summary and action point list will be placed on the noticeboard for people to read.

Crew change plans were outlined.

A digital camera has very kindly been donated by Woodside for the person who demonstrates best safety awareness, safety initiative or any action connected with safety. The 2 Captains, clients and PC will get together to decide on this. As the time since start of job has been short, it may seem unfair as to who gets it. We just have to make the best decision we can. Someone will be lucky.

The client, Ken Haig, then got up to say a few words. He thanked the entire crew on behalf Woodside for all their hard work to get this job under way.

he presented the Woodside "Stepback 5x5" safety initiative, and gave out cards for distribution around the crew.

He highlighted the fact that the Captain will be organising a skip on the dockside in Portland at crew change, and encouraged all depts to get rid of their old rubbish to make space for better storage. Woodside personel will be coming onboard at crew change to give the oncoming crew their safety induction, and they will very likely be looking over the boat again. Storage areas, backdeck and engine room spaces must be tidied up.

He also stated that all incidents and injuries, no matter how small, should be reported, and the clients/PC/Captain should be informed of the more serious ones promptly.

Finally, the PC thanked the entire engine room staff for their hard work during the transit from Singapore. There was an immense amount of work to get over, and their long hours is appreciated.

8.0 Trip HSE Target

Period:

MEETINGS	2
SOLAS TRAINING	6
DRILLS	6
AUDITS	12

Minutes of Meeting report

Subject: Woodside Safety audit recommendations meeting

Venue: M/V Orient Explorer, Mess Room

Time: 13:00 – 13:35

1.0 Meeting No.: 3 Date: 02.11.03

Present: DMNG Capt (Adviser) Vladimir Gutnik
C. Eng ” ” Vladimir Negoda
Interpreter Anatoly Kolodey

Australian Capt Steve Odlum
C. Eng Jim Riddle

PGS PC Esben Jettestad
S/L Nav Grady Henley
HSE Field Eng Chris Renshaw

Woodside Client Rep Ken Haig
Stephen Burt

5.0 PC opening & explaining the purpose of the meeting. Also informing about the internal audit done by the Australian Captain, DMNG Captain, PGS HSE field engineer and PC the day before.

Note: Please refer to minutes from meeting no.1 and no.2 for earlier statuses.

6.0 Recommendations list & with action points #1 –16 (*'ed points are highest priority action items).

All Key signage is to be translated from Russian into English ; **Completed.**

Lithium battery locker requires signage for PPE & a Lithium extinguisher. **Completed.**

* The ER chemical store is to be reassessed – storage, signage, MSDS's, segregation & ventilation.

02nd Nov Status: During the Capt / PC inspection 01.11.03 the following was represented:

- All fire hazardous chemicals moved to paint store on forecast, which has good ventilation (electrical fan)
- Good order in the chemical store
- MSDS sheets in place in the chemical and paint store.
- Ventilation in the chemical store is without an electrical fan, but found appropriate, as the chemical store does no longer have any toxic chemicals.

The client raised concerns for the high quantity of hydrochloric acid onboard.

The meeting group agreed to strict consider the amount of chemicals to be ordered in the future. It will then also be easier keep the level of orderliness we have achieved over the last 2 weeks with less quantity. Completed

4 A regular internal audit of the vessels PTW procedures to be incorporated into the weekly schedule to assess the quality of permits issued & levels of compliance.

2nd Nov Status: The PTW issued from now will be placed visually on the bridge until closed. This to make sure it is handed over at shift change and that it is being closed out by the person having the PTW. The PGS field engineer will in short time have a course among others in the PTW system and it will also be brought up on the next safety meeting the importance of following the implemented PTW system onboard. Completed

5 * Watertight doors (3) require clear directions for operating at the doors. The remote control for the frame 80 door requires signage identifying its location. *

2nd Nov status: The signs were checked on the inspection 01st Nov. All doors have properly mounted signs on both sides. Completed

6 Hydrostatic releases on the two float free lifejacket boxes at the after end of the bridge deck have expired (2002) & require renewing.

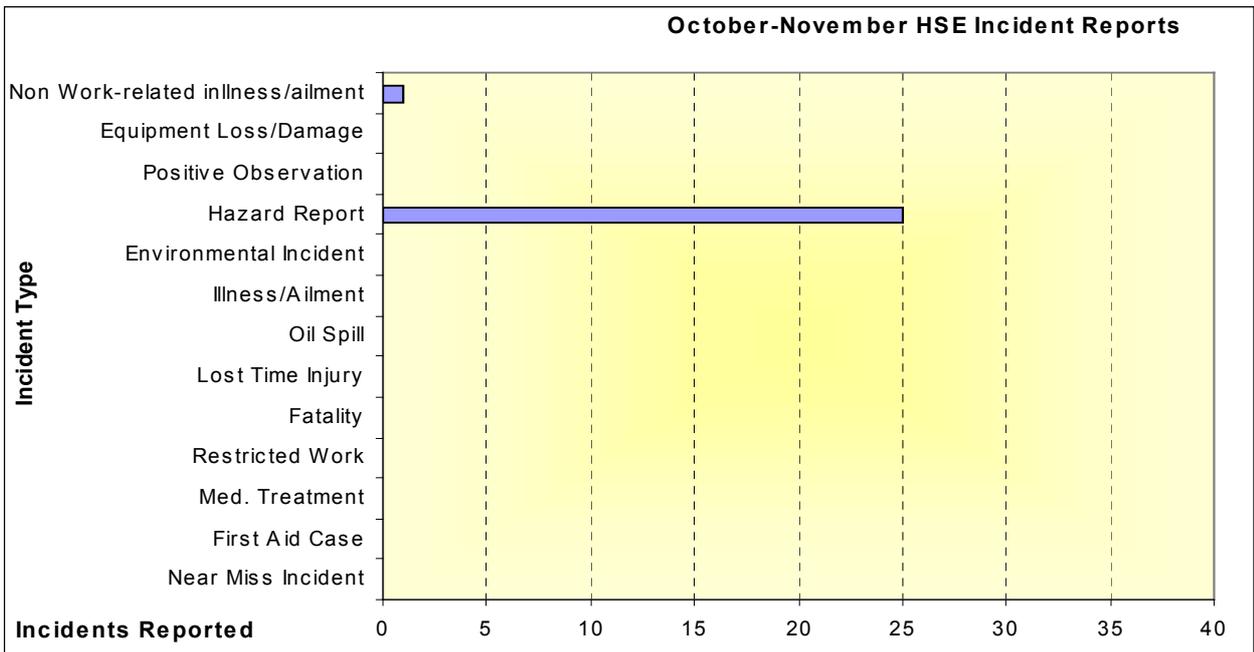
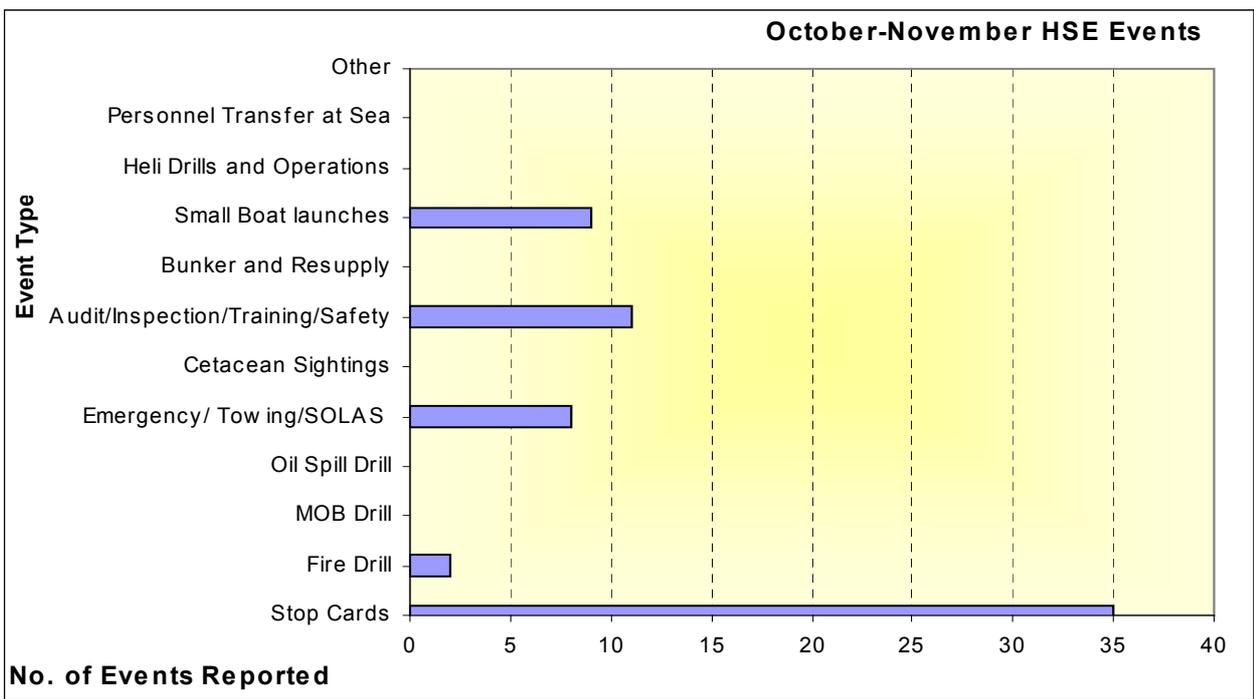
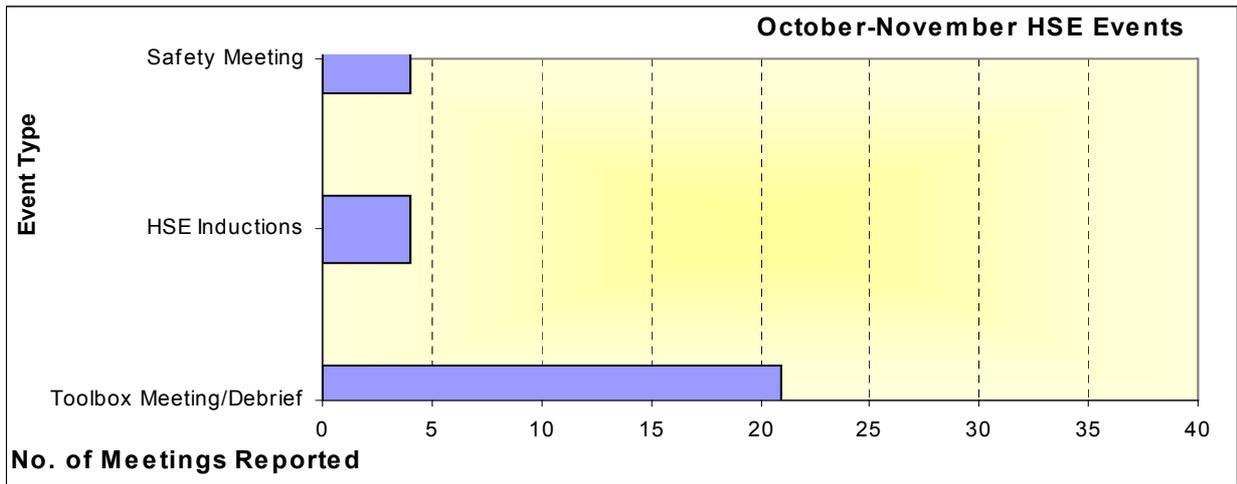
2nd Nov Status: All expired hydrostatic releases have been changed. Completed

- 7 Manual release wires for MOB liferafts (2x4 man) aft on gun deck require signs to indicate both what and where they are.**
Completed 24th Oct
- 8 * All chemicals on board to be rationalised, stowed correctly and removed from inappropriate containers – eg water bottles.**
2nd Nov status: No unmarked containers or bottles were found during the inspection 01st Nov. Completed
- 9 * Education campaign on chemical management to be undertaken.**
2nd Nov status: There are procedures in place in the PGS HSE manual (E 951-VES-09: Working with Streamer Fluids and E 963-VES-07: Handling, Storage & Use of Hazardous Substances) and also the Nordic Maritime safety manual. Also it will be stressed during the safety meeting the importance of reading the MSDS sheet before handling any chemicals.
The PGS HSE field engineer currently onboard will do instructions on handling of chemicals following the above mentioned procedures. Completed
- 10 * Gear register to be reinstated and kept up to date to reflect what is on board – ie slings, shackles, etc – any certificate and when it was last inspected by a competent person. This should include jackets worn when at the stern of the gun deck.**
2nd Nov status:
- All the lifting gear has a register and certificates being kept in the Captain office. The inspection of this is part of the ships maintenance program and recorded there.
 - The inspection of the crew savers is on crew rotation schedule and is a program initiated and maintained by the PGS chief mechanic. The PGS chief mechanic is responsible keeping track of all the life jackets and that all crew check their own crew savers. Completed
- 11 Instigate a system to ensure appropriate industry safety alerts are received on board and distributed – the last one found was from 1997.**
2nd Nov status: PGS already have a safety alert system, which is called experience transfers (ET). The ET's are distributed by the HSE department and involves near misses and incidents from other PGS boats and any related industry which the HSE department believe is relevant safety information for the PGS boats. Completed
- 12 * General housekeeping – the vessel has a number of lockers with an array of cardboard boxes and other items. These represent an unnecessary fire hazard.**
2nd Nov status: Good housekeeping was observed during the Capt / PC inspection 1st Nov. Completed
- 13 Four line throwing rockets in the appropriate box on the monkey island are out of date (2002) and to be disposed of next time in port.**
2nd Nov status: These were shipped of at last crew change in Portland. Completed
- 14 Re-write lifeboat launching instructions in English for simple use and repaint associated ball valves.**
Completed 27th Oct
- 15 Undertake a signage audit to determine which signs require translation into English, what are missing – eg PPE signage at drill press – and what need renewing.**
2nd Nov status: During the Capt / PC inspection 1st Nov it was observed a numerous number of signs translated and during the meeting we felt that the number of signs posted around on the vessel is at a maximum. The important once are already translated, and it will be brought up on the next safety meeting that if anyone believes a sign need translating the Interpreter should be contacted to sort this out. Completed
- 16 * HV switchboard in ER CR – supply appropriate PPE & equipment as per SOLAS 11-1 Reg 45**
2nd Nov Status: The appropriate PPE and instructions are in place. The Australian chief engineer recommended higher rubber boots than the one actually in place. Completed

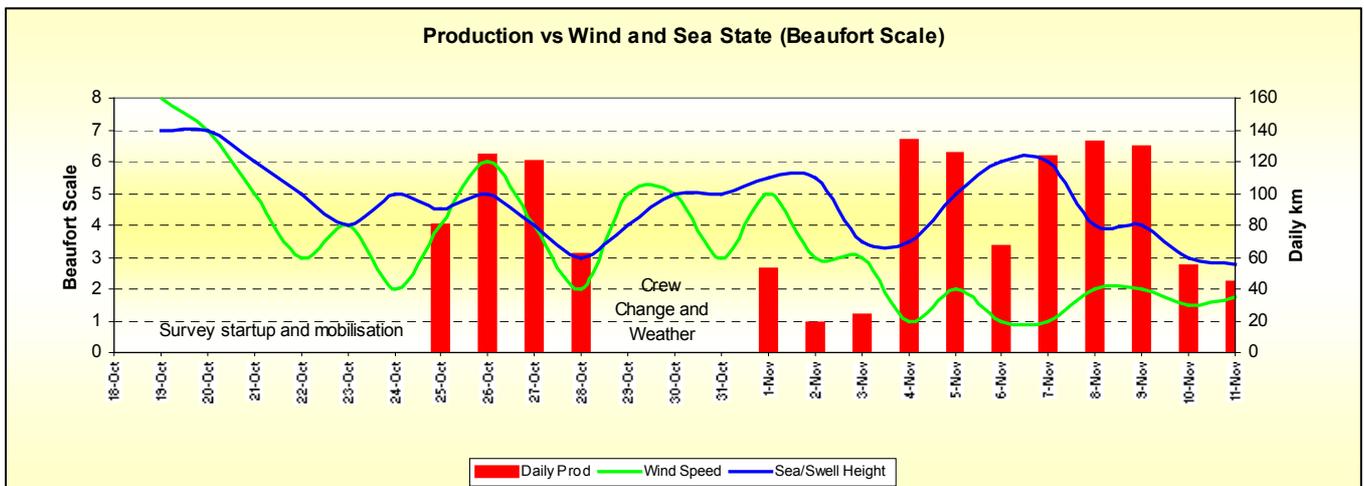
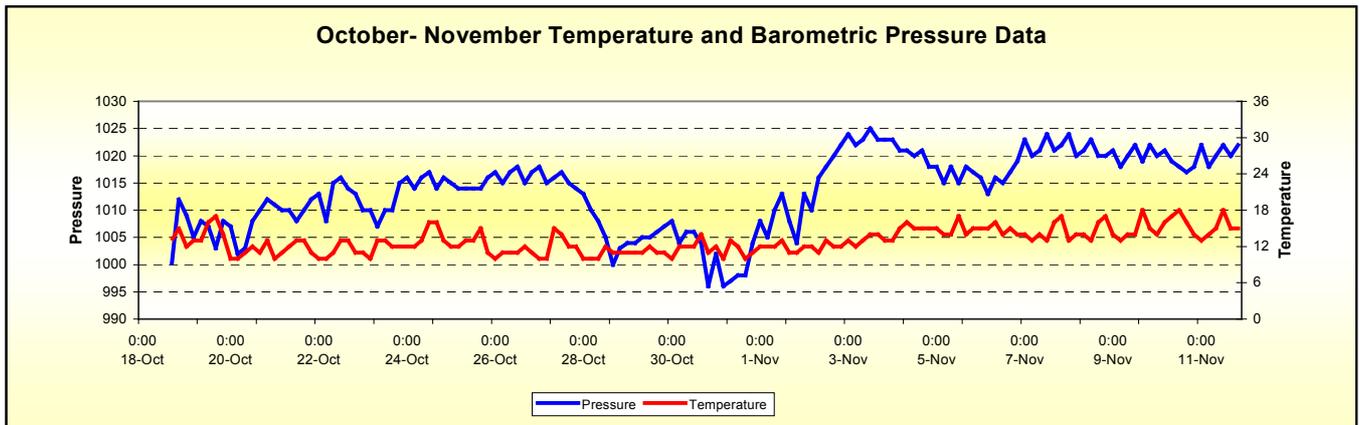
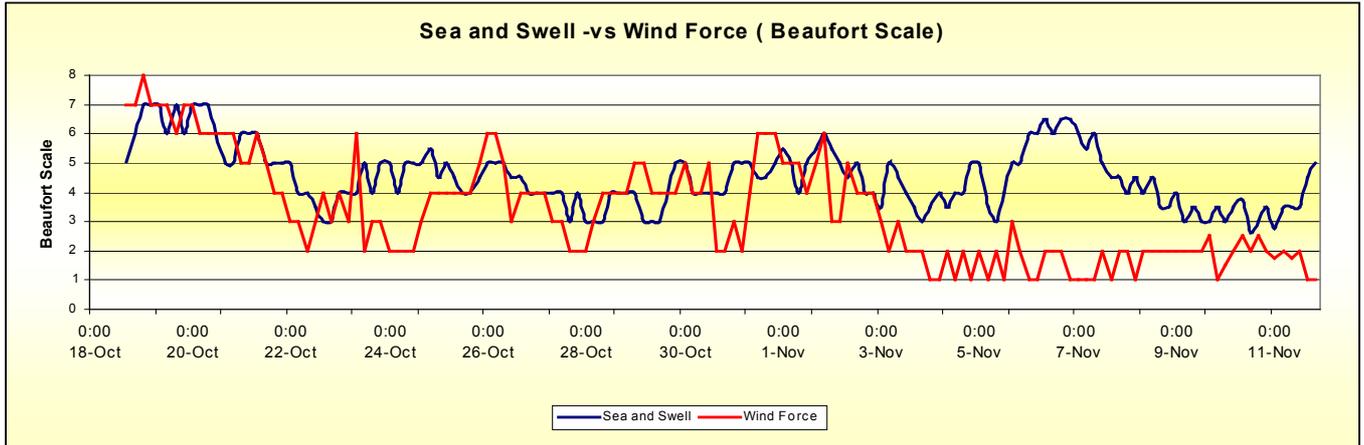
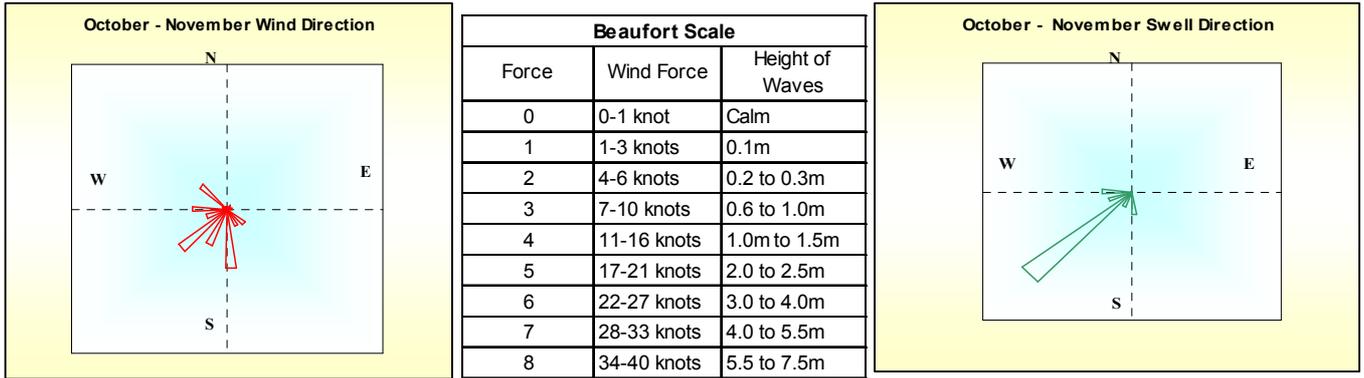
As it stands 2nd November 2003 all the members off the group agreed that all the points have been completed. Any comments from onshore is appreciated.

APPENDIX G: HSE PERFORMANCE

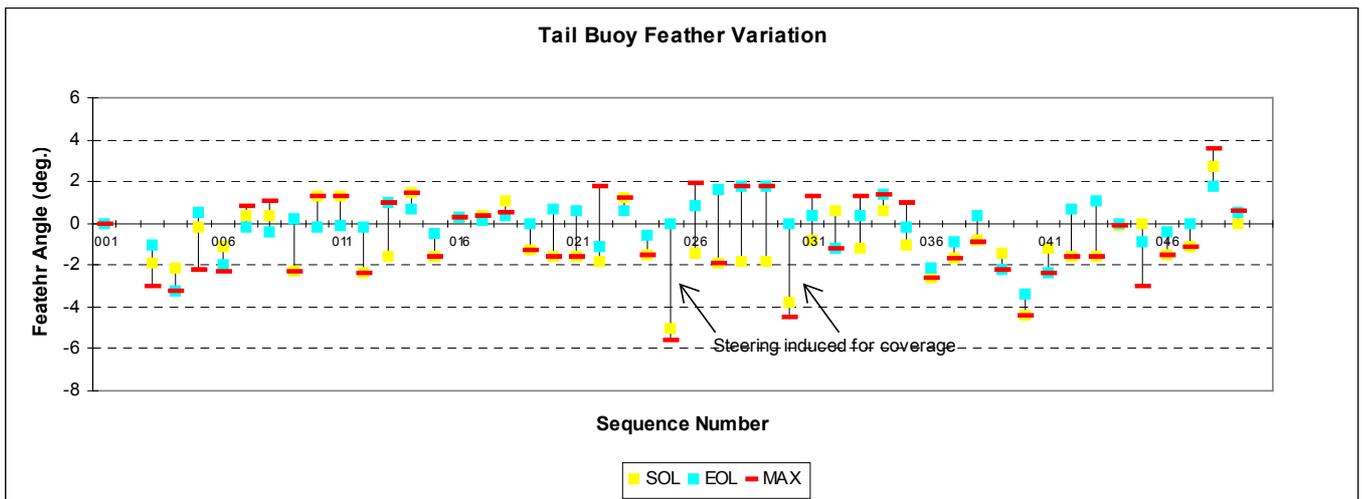
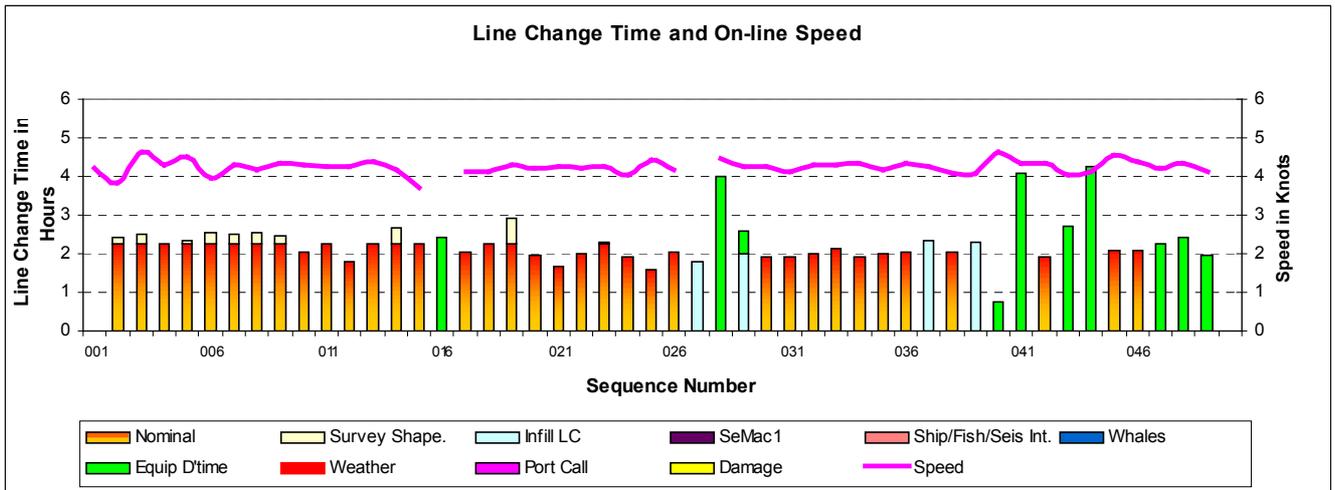
ANTARES 3D MSS HSE report for 10th Nov to 12th Nov			
Description	Week	Nov	Survey
Incidents			
Near Miss Incident	0	0	0
First Aid Case	0	0	0
Med. Treatment	0	0	0
Restricted Work	0	0	0
Fatality	0	0	0
Lost Time Injury	0	0	0
Oil Spill	0	0	0
Illness/Ailment	0	0	0
Environmental Incident	0	0	0
Hazard Report	18	24	25
Positive Observation	0	0	0
Equipment Loss/Damage	0	0	0
Non Work-related illness/ailment	0	0	1
Events			
Stop Cards	27	28	35
Fire Drill	1	2	2
MOB Drill	0	0	0
Oil Spill Drill	0	0	0
Emergency/ Towing/SOLAS	1	1	8
Cetacean Sightings	0	0	0
Audit/Inspection/Training/Safety	6	6	11
Bunker and Resupply	0	0	0
Small Boat launches	6	7	9
Heli Drills and Operations	0	0	0
Personnel Transfer at Sea	0	0	0
Other	0	0	0
Meetings			
Toolbox Meeting/Debrief	7	10	21
HSE Inductions	0	1	4
Safety Meeting	1	2	4
Personnel Totals and Man-hours			
No. of Marine Crew	175	300	676
No. of Seismic Crew	154	264	582
Medic	7	12	27
No. of Woodside Reps	14	24	54
Chase Boat Crews	70	114	259
Total Man-hours	2124	8604	19212
(* Man-hours - based on 12 hours per day per man)			
Small Boat Operations			
Small Boat Hours	0	6.67	11.15
Small Boat Exposure Hours	0	26.68	44.60
(In-water time) * (Number of Crew)			
Fuel Usage (cubic Metres)	69	142.08	297.08



APPENDIX I: WEATHER OBSERVATIONS



APPENDIX J: LINE CHANGE TIME, SPEED & TAIL BUOY FEATHER



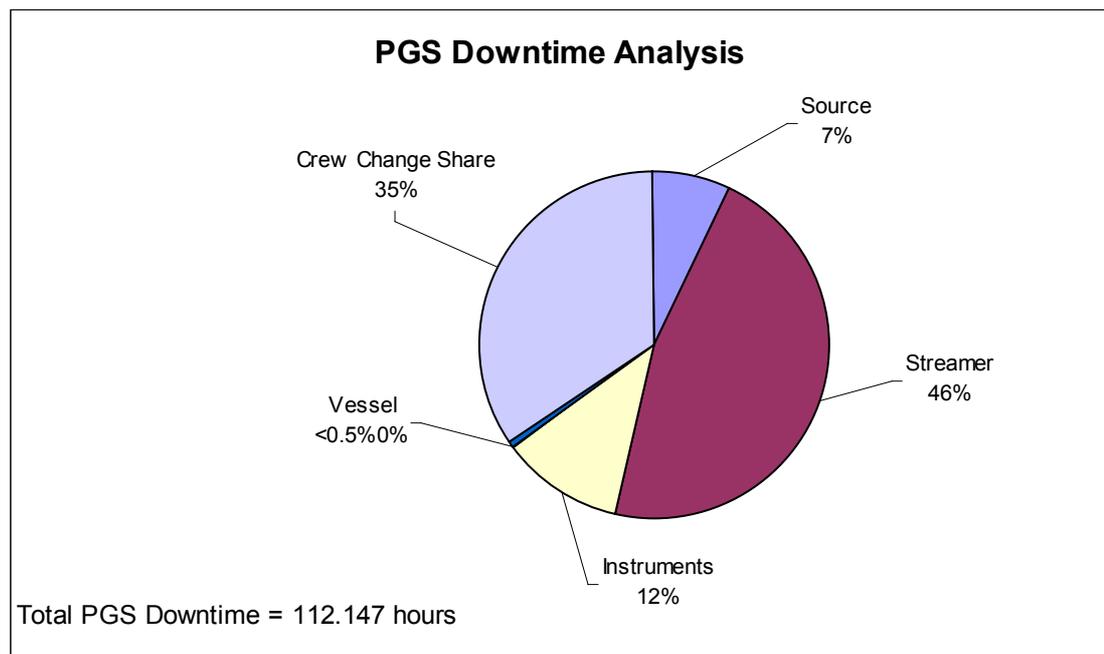
APPENDIX K: CONTRACTOR DOWNTIME STATISTICS

Instrument Failure:	15.75 hours (Syntrak and tape error faults)
Source:	7.95 hours (Air-leaks and autofires)
Streamer:	48.983 hours (Modules and lead-in of streamer 4 – extraction errors)
Vessel Time:	0.50 hours (vessel fuel priming problems in Portland on crew change
PGS Crew Change Time:	36.54 hours (PGS portion 50/50 on scheduled crew time.
PGS Request:	3.00 hours (delay vessel departure due to late crew person during Portland Crew Change.

MOBILISATION AND DEMOB TIME

(Set payment not included as PGS Downtime Category)

Mob:	140.25 hours (MOB in Portland, start-up, travel and deploy)
Demob:	19.383 hours (time from completion to recovery of 3 streamers + 1 hour as agreed by Woodside)



APPENDIX L: PRODUCTION AND TIMING STATISTICS

Line Type Analysis

	Period	(%)	Survey	(%)
Prime	1,124.08125	87	1,124.08125	87
Infill	164.60625	13	164.60625	13
Infill (% of Prime)	15	-	15	-
Total :	1,288.68750	100	1,288.68750	100

Line Charge AnalysisSailed Kms

	Period	(%)	Survey	(%)
Prime	1,131.75000	86	1,131.75000	86
Infill	166.35000	13	166.35000	13
Infill (% of Prime)	15	-	15	-
N/C Reshoot	14.58750	1	14.58750	1
Total :	1,312.68750	100	1,312.68750	100

Charged Sailed Kms

	Period	(%)	Survey	(%)
Prime	1,124.08125	87	1,124.08125	87
Infill	164.60625	13	164.60625	13
Infill (% of Prime)	15	-	15	-
Total :	1,288.68750	100	1,288.68750	100

CMP Kms

	Period	(%)	Survey	(%)
Prime	8,992.65000	87	8,992.65000	87
Infill	1,316.85000	13	1,316.85000	13
Infill (% of Prime)	15	-	15	-
Total :	10,309.50000	100	10,309.50000	100

Square Kms

	Period	(%)	Survey	(%)
Prime	224.81625	87	224.81625	87
Infill	32.92125	13	32.92125	13
Infill (% of Prime)	15	-	15	-
Total :	257.73750	100	257.73750	100

Fullfold Sailed Kms

	Period	(%)	Survey	(%)
Prime	1,057.25625	87	1,057.25625	87
Infill	154.48125	13	154.48125	13
Infill (% of Prime)	15	-	15	-
Total :	1,211.73750	100	1,211.73750	100

Fullfold CMP Kms

	Period	(%)	Survey	(%)
Prime	8,458.05000	87	8,458.05000	87
Infill	1,236.45000	13	1,236.45000	13
Infill (% of Prime)	15	-	15	-
Total :	9,694.50000	100	9,694.50000	100

Fullfold Square Kms

	Period	(%)	Survey	(%)
Prime	211.45125	87	211.45125	87
Infill	30.91125	13	30.91125	13
Infill (% of Prime)	15	-	15	-
Total :	242.36250	100	242.36250	100

Time Activity Analysis

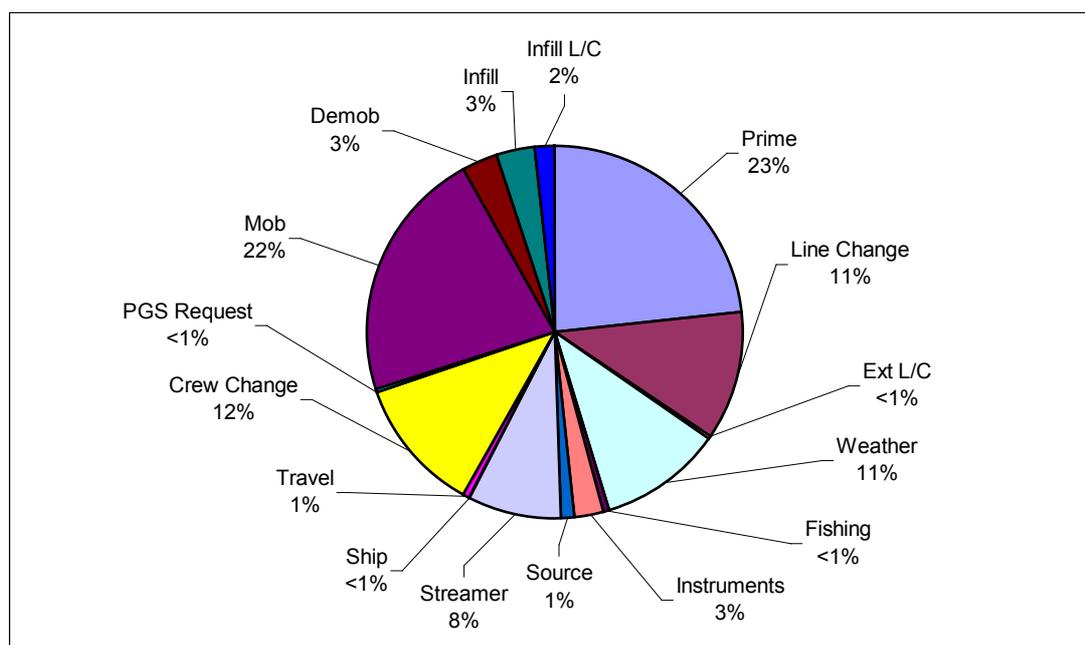
	Period	(%)	Survey	(%)
Recording	145.467	23	145.467	23
Line Change	70.500	11	70.500	11
Extended L/C	1.900	0	1.900	0
Weather	65.733	11	65.733	11
Fishing Activity	2.250	0	2.250	0
Instrument	15.750	3	15.750	3
Source	7.950	1	7.950	1
Streamer	48.983	8	48.983	8
Ship	0.500	0	0.500	0
Travel t/f Port	4.250	1	4.250	1
Port/Crew Change	71.917	12	71.917	12
Contractor	3.000	0	3.000	0
Mobilisation	136.000	22	136.000	22
Demobilisation	19.383	3	19.383	3
Infill L/C	10.500	2	10.500	2
Infill	20.917	3	20.917	3
Total :	625.000	100	625.000	100

Time Cause/Reason Analysis

	Period	(%)	Survey	(%)
Production	215.967	35	215.967	35
Infill	31.417	5	31.417	5
Weather	65.733	11	65.733	11
Equip.Fail	73.183	12	73.183	12
MOB/DeMOB	159.633	26	159.633	26
Wside.Req	35.950	6	35.950	6
Crew Change	35.967	6	35.967	6
PGS	3.000	0	3.000	0
Fishing Int	2.250	0	2.250	0
Survey Shape	1.900	0	1.900	0
Total :	625.000	100	625.000	100

Time Charge Analysis

	Period	(%)	Survey	(%)
Prime	145.467	23	145.467	23
Operations	70.500	11	70.500	11
Standby	105.833	17	105.833	17
Contractor	112.150	18	112.150	18
Mob/Demob	159.633	26	159.633	26
Infill/Stby	31.417	5	31.417	5
Total :	625.000	100	625.000	100

**TOTAL TIME CHARGE BREAKDOWN**

APPENDIX M: SEISMIC TAPE LOG

Sorted by Line Number

Seq	Line Name	Line Type	Line Status	Tape Sys. 1		Tape Sys. 2		Shot Points		Files Rec. #	
				First	Last	First	Last	First	Last	First	Last
10	WO3ANT-1004P1	Prime	Incomplete	35642	35645	0	0	1022	2944	1109	2920
13	WO3ANT-1012P1	Prime	Incomplete	35651	35655	0	0	1001	2944	151	5789
16	WO3ANT-1012P2	N/C Reshoot	Completed	35667	35667	0	0	2092	2153	151	2153
26	WO3ANT-1020I1	N/C Reshoot	Completed	35709	35709	0	0	1529	1574	679	715
26	WO3ANT-1020I1	Infill	Completed	35708	35709	0	0	1001	1528	151	678
26	WO3ANT-1020I1	Infill	Completed	35709	35710	0	0	1575	2238	716	1379
26	WO3ANT-1020I1	N/C Reshoot	Completed	35710	35711	0	0	2239	2281	1380	1422
26	WO3ANT-1020I1	Infill	Completed	35711	35712	0	0	2282	2944	1423	2087
20	WO3ANT-1020P1	Prime	Completed	35679	35683	0	0	1001	2944	151	6367
24	WO3ANT-1028P1	Prime	Completed	35697	35703	0	0	1001	2944	151	5661
6	WO3ANT-1036P1	Prime	Completed	35626	35629	0	0	1001	2944	151	2090
18	WO3ANT-1044P1	Prime	Completed	35671	35674	0	0	1001	2944	151	2090
22	WO3ANT-1052P1	Prime	Completed	35688	35691	0	0	1001	2944	151	2094
29	WO3ANT-1060P1	Prime	Incomplete	35719	35724	0	0	1001	2944	151	6707
49	WO3ANT-1060P2	Prime	Completed	35780	35780	0	0	1001	1230	151	390
31	WO3ANT-1068P1	Prime	Completed	35728	35731	0	0	1001	2944	151	2094
33	WO3ANT-1076P1	Prime	Completed	35737	35741	0	0	1003	2944	101	2043
37	WO3ANT-1084I1	Infill	Completed	35753	35756	0	0	1001	2944	151	2092
35	WO3ANT-1084P1	Prime	Completed	35746	35749	0	0	1001	2944	151	2094
14	WO3ANT-1092P1	Prime	Incomplete	35656	35662	0	0	1100	2944	157	5731
46	WO3ANT-1092P2	Prime	Completed	35775	35775	0	0	1001	1099	151	259
47	WO3ANT-1092P3	N/C Reshoot	Completed	35776	35776	0	0	2102	2220	151	269
8	WO3ANT-1100P1	Prime	Completed	35634	35637	0	0	1001	2944	151	2094
4	WO3ANT-1108P1	Prime	Completed	35618	35621	0	0	1001	2944	101	2091
39	WO3ANT-1116I1	Infill	Completed	35760	35763	0	0	1001	2944	151	2092
1	WO3ANT-1116P1	Prime	Scratched	0	0	0	0	1080	1258	0	0
2	WO3ANT-1116P2	Prime	Incomplete	35612	35613	0	0	1782	2944	102	1264
43	WO3ANT-1116P3	Prime	Completed	35769	35770	0	0	1001	1781	151	941
11	WO3ANT-1124P1	Prime	Incomplete	35646	35648	0	0	2836	1678	151	1307
12	WO3ANT-1124P2	Prime	Completed	35649	35650	0	0	1677	893	151	943
9	WO3ANT-1132P1	Prime	Completed	35638	35641	0	0	2836	893	151	2092
7	WO3ANT-1140P1	Prime	Completed	35630	35633	0	0	2836	893	151	2094
5	WO3ANT-1148P1	Prime	Completed	35622	35625	0	0	2836	893	101	2094
3	WO3ANT-1156P1	Prime	Completed	35614	35617	0	0	2836	893	101	2140
15	WO3ANT-1164P1	Prime	Completed	35663	35666	0	0	2813	893	100	893
19	WO3ANT-1172P1	Prime	Completed	35675	35678	0	0	2759	893	151	2017
21	WO3ANT-1180P1	Prime	Completed	35684	35687	0	0	2730	893	151	6256
40	WO3ANT-1180P2	N/C Reshoot	Completed	35764	35764	0	0	2588	2415	151	322
23	WO3ANT-1188P1	Prime	Completed	35692	35696	0	0	2658	893	5001	6763
27	WO3ANT-1196I1	Infill	Scratched	35713	35714	0	0	2648	2556	101	5011
28	WO3ANT-1196I2	Infill	Completed	35715	35718	0	0	2598	893	151	1854
25	WO3ANT-1196P1	Prime	Completed	35704	35707	0	0	2634	893	151	6065
41	WO3ANT-1196P2	N/C Reshoot	Completed	35765	35765	0	0	2106	1949	151	308
30	WO3ANT-1204P1	Prime	Completed	35725	35727	0	0	2544	893	151	1800
32	WO3ANT-1212P1	Prime	Completed	35732	35736	0	0	2525	893	151	5877
44	WO3ANT-1212P2	N/C Reshoot	Completed	35771	35771	0	0	1938	1763	151	326
34	WO3ANT-1220P1	Prime	Completed	35742	35745	0	0	2478	893	151	1736
36	WO3ANT-1228P1	Prime	Completed	35750	35752	0	0	2425	893	151	1679
38	WO3ANT-1236P1	Prime	Completed	35757	35759	0	0	2372	893	151	1630
42	WO3ANT-1244P1	Prime	Completed	35766	35768	0	0	2319	893	151	1577
48	WO3ANT-1252I1	Infill	Completed	36777	35779	0	0	2222	893	151	1480
45	WO3ANT-1252P1	Prime	Completed	35772	35774	0	0	2265	893	151	1523
17	WO3ANT-1260P1	Prime	Completed	35668	35670	0	0	2168	893	151	1426

Sorted by Sequence Number

Seq	Line Name	Line Type	Line Status	Tape Sys. 1		Tape Sys. 2		Shot Points		Files Rec. #	
				First	Last	First	Last	First	Last	First	Last

1	WO3ANT-1116P1	Prime	Scratched	0	0	0	0	1080	1258	0	0
2	WO3ANT-1116P2	Prime	Incomplete	35612	35613	0	0	1782	2944	102	1264
3	WO3ANT-1156P1	Prime	Completed	35614	35617	0	0	2836	893	101	2140
4	WO3ANT-1108P1	Prime	Completed	35618	35621	0	0	1001	2944	101	2091
5	WO3ANT-1148P1	Prime	Completed	35622	35625	0	0	2836	893	101	2094
6	WO3ANT-1036P1	Prime	Completed	35626	35629	0	0	1001	2944	151	2090
7	WO3ANT-1140P1	Prime	Completed	35630	35633	0	0	2836	893	151	2094
8	WO3ANT-1100P1	Prime	Completed	35634	35637	0	0	1001	2944	151	2094
9	WO3ANT-1132P1	Prime	Completed	35638	35641	0	0	2836	893	151	2092
10	WO3ANT-1004P1	Prime	Incomplete	35642	35645	0	0	1022	2944	1109	2920
11	WO3ANT-1124P1	Prime	Incomplete	35646	35648	0	0	2836	1678	151	1307
12	WO3ANT-1148P2	Prime	Completed	35649	35650	0	0	1677	893	151	943
13	WO3ANT-1012P1	Prime	Incomplete	35651	35655	0	0	1001	2944	151	5789
14	WO3ANT-1092P1	Prime	Incomplete	35656	35662	0	0	1100	2944	157	5731
15	WO3ANT-1164P1	Prime	Completed	35663	35666	0	0	2813	893	100	893
16	WO3ANT-1012P2	N/C Reshoot	Completed	35667	35667	0	0	2092	2153	151	2153
17	WO3ANT-1260P1	Prime	Completed	35668	35670	0	0	2168	893	151	1426
18	WO3ANT-1044P1	Prime	Completed	35671	35674	0	0	1001	2944	151	2090
19	WO3ANT-1172P1	Prime	Completed	35675	35678	0	0	2759	893	151	2017
20	WO3ANT-1020P1	Prime	Completed	35679	35683	0	0	1001	2944	151	6367
21	WO3ANT-1180P1	Prime	Completed	35684	35687	0	0	2730	893	151	6256
22	WO3ANT-1052P1	Prime	Completed	35688	35691	0	0	1001	2944	151	2094
23	WO3ANT-1188P1	Prime	Completed	35692	35696	0	0	2658	893	5001	6763
24	WO3ANT-1028P1	Prime	Completed	35697	35703	0	0	1001	2944	151	5661
25	WO3ANT-1196P1	Prime	Completed	35704	35707	0	0	2634	893	151	6065
26	WO3ANT-1020I1	N/C Reshoot	Completed	35709	35709	0	0	1529	1574	679	715
26	WO3ANT-1020I1	Infill	Completed	35708	35709	0	0	1001	1528	151	678
26	WO3ANT-1020I1	Infill	Completed	35711	35712	0	0	2282	2944	1423	2087
26	WO3ANT-1020I1	N/C Reshoot	Completed	35710	35711	0	0	2239	2281	1380	1422
26	WO3ANT-1020I1	Infill	Completed	35709	35710	0	0	1575	2238	716	1379
27	WO3ANT-1196I1	Infill	Scratched	35713	35714	0	0	2648	2556	101	5011
28	WO3ANT-1196I2	Infill	Completed	35715	35718	0	0	2598	893	151	1854
29	WO3ANT-1060P1	Prime	Incomplete	35719	35724	0	0	1001	2944	151	6707
30	WO3ANT-1204P1	Prime	Completed	35725	35727	0	0	2544	893	151	1800
31	WO3ANT-1068P1	Prime	Completed	35728	35731	0	0	1001	2944	151	2094
32	WO3ANT-1212P1	Prime	Completed	35732	35736	0	0	2525	893	151	5877
33	WO3ANT-1076P1	Prime	Completed	35737	35741	0	0	1003	2944	101	2043
34	WO3ANT-1220P1	Prime	Completed	35742	35745	0	0	2478	893	151	1736
35	WO3ANT-1084P1	Prime	Completed	35746	35749	0	0	1001	2944	151	2094
36	WO3ANT-1228P1	Prime	Completed	35750	35752	0	0	2425	893	151	1679
37	WO3ANT-1084I1	Infill	Completed	35753	35756	0	0	1001	2944	151	2092
38	WO3ANT-1236P1	Prime	Completed	35757	35759	0	0	2372	893	151	1630
39	WO3ANT-1116I1	Infill	Completed	35760	35763	0	0	1001	2944	151	2092
40	WO3ANT-1180P2	N/C Reshoot	Completed	35764	35764	0	0	2588	2415	151	322
41	WO3ANT-1196P2	N/C Reshoot	Completed	35765	35765	0	0	2106	1949	151	308
42	WO3ANT-1244P1	Prime	Completed	35766	35768	0	0	2319	893	151	1577
43	WO3ANT-1116P3	Prime	Completed	35769	35770	0	0	1001	1781	151	941
44	WO3ANT-1212P2	N/C Reshoot	Completed	35771	35771	0	0	1938	1763	151	326
45	WO3ANT-1252P1	Prime	Completed	35772	35774	0	0	2265	893	151	1523
46	WO3ANT-1092P2	Prime	Completed	35775	35775	0	0	1001	1099	151	259
47	WO3ANT-1092P3	N/C Reshoot	Completed	35776	35776	0	0	2102	2220	151	269
48	WO3ANT-1252I1	Infill	Completed	35777	35779	0	0	2222	893	151	1480
49	WO3ANT-1060P2	Prime	Completed	35780	35780	0	0	1001	1230	151	390

APPENDIX N: SEISMIC LINE LOG

Sorted by Line Number

Seq	Line Name	Hdg	Line Type	Line Status	FSP	LSP	FcSP	LcSP
10	WO3ANT-1004P1	125	Prime	Incomplete	1022	2944	1022	2944
13	WO3ANT-1012P1	125	Prime	Incomplete	1001	2944	1001	2944
16	WO3ANT-1012P2	125	N/C Reshoot	Completed	2092	2153	0	0
26	WO3ANT-1020I1	125	Infill	Completed	2282	2944	2282	2944
26	WO3ANT-1020I1	125	Infill	Completed	1001	1528	1001	1528
26	WO3ANT-1020I1	125	N/C Reshoot	Completed	1529	1574	0	0
26	WO3ANT-1020I1	125	N/C Reshoot	Completed	2239	2281	0	0
26	WO3ANT-1020I1	125	Infill	Completed	1575	2238	1575	2238
20	WO3ANT-1020P1	125	Prime	Completed	1001	2944	1001	2944
24	WO3ANT-1028P1	125	Prime	Completed	1001	2944	1001	2944
6	WO3ANT-1036P1	126	Prime	Completed	1001	2944	1001	2944
18	WO3ANT-1044P1	125	Prime	Completed	1001	2944	1001	2944
22	WO3ANT-1052P1	126	Prime	Completed	1001	2944	1001	2944
29	WO3ANT-1060P1	125	Prime	Incomplete	1001	2944	1231	2944
49	WO3ANT-1060P2	305	Prime	Completed	1001	1230	1001	1230
31	WO3ANT-1068P1	125	Prime	Completed	1001	2944	1001	2944
33	WO3ANT-1076P1	125	Prime	Completed	1003	2944	1003	2944
37	WO3ANT-1084I1	305	Infill	Completed	1001	2944	1001	2944
35	WO3ANT-1084P1	125	Prime	Completed	1001	2944	1001	2944
14	WO3ANT-1092P1	125	Prime	Incomplete	1100	2944	1100	2944
46	WO3ANT-1092P2	126	Prime	Completed	1001	1099	1001	1099
47	WO3ANT-1092P3	125	N/C Reshoot	Completed	2102	2220	0	0
8	WO3ANT-1100P1	125	Prime	Completed	1001	2944	1001	2944
4	WO3ANT-1108P1	125	Prime	Completed	1001	2944	1001	2944
39	WO3ANT-1116I1	305	Infill	Completed	1001	2944	1001	2944
1	WO3ANT-1116P1	125	Prime	Scratched	1080	1258	0	0
2	WO3ANT-1116P2	125	Prime	Incomplete	1782	2944	1782	2944
43	WO3ANT-1116P3	305	Prime	Completed	1001	1781	1001	1781
11	WO3ANT-1124P1	305	Prime	Incomplete	2836	1678	2836	1678
12	WO3ANT-1124P2	305	Prime	Completed	1677	893	1677	893
9	WO3ANT-1132P1	305	Prime	Completed	2836	893	2836	893
7	WO3ANT-1140P1	305	Prime	Completed	2836	893	2836	893
5	WO3ANT-1148P1	305	Prime	Completed	2836	893	2836	893
3	WO3ANT-1156P1	305	Prime	Completed	2836	893	2836	893
15	WO3ANT-1164P1	305	Prime	Completed	2813	893	2813	893
19	WO3ANT-1172P1	305	Prime	Completed	2759	893	2759	893
21	WO3ANT-1180P1	305	Prime	Completed	2730	893	2730	893
40	WO3ANT-1180P2	305	N/C Reshoot	Completed	2588	2415	0	0
23	WO3ANT-1188P1	305	Prime	Completed	2658	893	2658	893
27	WO3ANT-1196I1	305	Infill	Scratched	2648	2556	0	0
28	WO3ANT-1196I2	305	Infill	Completed	2598	893	2598	893
25	WO3ANT-1196P1	305	Prime	Completed	2634	893	2634	893
41	WO3ANT-1196P2	305	N/C Reshoot	Completed	2106	1949	0	0
30	WO3ANT-1204P1	305	Prime	Completed	2544	893	2544	893
32	WO3ANT-1212P1	305	Prime	Completed	2525	893	2525	893
44	WO3ANT-1212P2	305	N/C Reshoot	Completed	1938	1763	0	0
34	WO3ANT-1220P1	305	Prime	Completed	2478	893	2478	893
36	WO3ANT-1228P1	305	Prime	Completed	2425	893	2425	893
38	WO3ANT-1236P1	305	Prime	Completed	2372	893	2372	893
42	WO3ANT-1244P1	305	Prime	Completed	2319	893	2319	893
48	WO3ANT-1252I1	305	Infill	Completed	2222	893	2222	893
45	WO3ANT-1252P1	305	Prime	Completed	2265	893	2265	893
17	WO3ANT-1260P1	305	Prime	Completed	2168	893	2168	893

Sorted by Sequence Number

Seq	Line Name	Hdg	Line Type	Line Status	FSP	LSP	FcSP	LcSP
1	WO3ANT-1116P1	125	Prime	Scratched	1080	1258	0	0
2	WO3ANT-1116P2	125	Prime	Incomplete	1782	2944	1782	2944
3	WO3ANT-1156P1	305	Prime	Completed	2836	893	2836	893
4	WO3ANT-1108P1	125	Prime	Completed	1001	2944	1001	2944
5	WO3ANT-1148P1	305	Prime	Completed	2836	893	2836	893
6	WO3ANT-1036P1	126	Prime	Completed	1001	2944	1001	2944
7	WO3ANT-1140P1	305	Prime	Completed	2836	893	2836	893
8	WO3ANT-1100P1	125	Prime	Completed	1001	2944	1001	2944
9	WO3ANT-1132P1	305	Prime	Completed	2836	893	2836	893
10	WO3ANT-1004P1	125	Prime	Incomplete	1022	2944	1022	2944
11	WO3ANT-1124P1	305	Prime	Incomplete	2836	1678	2836	1678
12	WO3ANT-1124P2	305	Prime	Completed	1677	893	1677	893
13	WO3ANT-1012P1	125	Prime	Incomplete	1001	2944	1001	2944
14	WO3ANT-1092P1	125	Prime	Incomplete	1100	2944	1100	2944
15	WO3ANT-1164P1	305	Prime	Completed	2813	893	2813	893
16	WO3ANT-1012P2	125	N/C Reshoot	Completed	2092	2153	0	0
17	WO3ANT-1260P1	305	Prime	Completed	2168	893	2168	893
18	WO3ANT-1044P1	125	Prime	Completed	1001	2944	1001	2944
19	WO3ANT-1172P1	305	Prime	Completed	2759	893	2759	893
20	WO3ANT-1020P1	125	Prime	Completed	1001	2944	1001	2944
21	WO3ANT-1180P1	305	Prime	Completed	2730	893	2730	893
22	WO3ANT-1052P1	126	Prime	Completed	1001	2944	1001	2944
23	WO3ANT-1188P1	305	Prime	Completed	2658	893	2658	893
24	WO3ANT-1028P1	125	Prime	Completed	1001	2944	1001	2944
25	WO3ANT-1196P1	305	Prime	Completed	2634	893	2634	893
26	WO3ANT-1020I1	125	N/C Reshoot	Completed	2239	2281	0	0
26	WO3ANT-1020I1	125	N/C Reshoot	Completed	1529	1574	0	0
26	WO3ANT-1020I1	125	Infill	Completed	1575	2238	1575	2238
26	WO3ANT-1020I1	125	Infill	Completed	1001	1528	1001	1528
26	WO3ANT-1020I1	125	Infill	Completed	2282	2944	2282	2944
27	WO3ANT-1196I1	305	Infill	Scratched	2648	2556	0	0
28	WO3ANT-1196I2	305	Infill	Completed	2598	893	2598	893
29	WO3ANT-1060P1	125	Prime	Incomplete	1001	2944	1231	2944
30	WO3ANT-1204P1	305	Prime	Completed	2544	893	2544	893
31	WO3ANT-1068P1	125	Prime	Completed	1001	2944	1001	2944
32	WO3ANT-1212P1	305	Prime	Completed	2525	893	2525	893
33	WO3ANT-1076P1	125	Prime	Completed	1003	2944	1003	2944
34	WO3ANT-1220P1	305	Prime	Completed	2478	893	2478	893
35	WO3ANT-1084P1	125	Prime	Completed	1001	2944	1001	2944
36	WO3ANT-1228P1	305	Prime	Completed	2425	893	2425	893
37	WO3ANT-1084I1	305	Infill	Completed	1001	2944	1001	2944
38	WO3ANT-1236P1	305	Prime	Completed	2372	893	2372	893
39	WO3ANT-1116I1	305	Infill	Completed	1001	2944	1001	2944
40	WO3ANT-1180P2	305	N/C Reshoot	Completed	2588	2415	0	0
41	WO3ANT-1196P2	305	N/C Reshoot	Completed	2106	1949	0	0
42	WO3ANT-1244P1	305	Prime	Completed	2319	893	2319	893
43	WO3ANT-1116P3	305	Prime	Completed	1001	1781	1001	1781
44	WO3ANT-1212P2	305	N/C Reshoot	Completed	1938	1763	0	0
45	WO3ANT-1252P1	305	Prime	Completed	2265	893	2265	893
46	WO3ANT-1092P2	126	Prime	Completed	1001	1099	1001	1099
47	WO3ANT-1092P3	125	N/C Reshoot	Completed	2102	2220	0	0
48	WO3ANT-1252I1	305	Infill	Completed	2222	893	2222	893
49	WO3ANT-1060P2	305	Prime	Completed	1001	1230	1001	1230

APPENDIX O: SEQUENCE LINE QC REMARKS

ANTARES 3D MARINE SEISMIC SURVEY

Contractor: PGS Asia Pacific
Woodside Reprs: K.Haig, S.Burt
WEL Project Manager: R.Weiss

Vessel: M/V Orient Explorer
Party Chief: S.Beer/E.Jettestad
Date: 17th Oct to 11th Nov

SEQ	COMMENTS
001 Dir 125°	W03ANT1116 P1 SP 1001-1080 Line aborted – Not to be processed. Missed SP 1001 – 1080 due to incorrect baud rate into Syntrak and forced to reboot the system at the FSP. At SP 1258 – last SP of the line an autofire on array occurred and the line was terminated. All data scratched – not to be processed.
002 Dir 125°	W03ANT1116 P2 SP 1782 - 2944 Line portion complete Data Tape Nos: 35612 - 35613 Restart of previous line sequence – this line portion is complete. Shotpoints 1001-1781 to be reshot. Streamer depths slightly erratic due to the sea and swell conditions. Weather: Winds SE 20-22 Knots , Sea and Swell: S 2m. Noise at SOL: 5µB, EOL: 5µB (6Hz lo-cut filter applied) Water Depth: SOL: 39.3m, EOL: 53,7m Feather at SOL: -0.4°, EOL : 1,7-°, Max: -2,2° Streamer Depth: 7.8 – 8.0m due to prevailing swell – acceptable depth control. Noisy Traces: Nil logged – random swell bursts throughout the line - acceptable Gun Volume @ SOL: 2500 , EOL: 2500 SP 2148 Gun 5-4 disabled, gun 4-7 enabled. No volume variation. Gun edits: SP 2146, 2156 misfires Missed Shots: SP 2132, 2382 No data recorded.
003 Dir 305°	W03ANT1156 P1 SP 2836-893 Complete Data Tape Nos: 35614 - 35617 Streamer depths slightly erratic due to the sea and swell conditions. Streamer depth set to 8.5m to reduce effects of swell interference. Random swell noise bursts observed throughout the line. SP 1311, file number – incorrect SP number in header, should read 1318 Weather: Winds SE 20 Knots , Sea and Swell: SSW 2m. Noise at SOL: 6-7µB, EOL: 7-8µB (6Hz lo-cut filter applied) Water Depth: SOL: 56.2m, EOL: 36.8m Feather at SOL: -1.9°, EOL : -1.07°, Max: -3.0° Streamer Depth: 8.5 metres due to prevailing swell – acceptable depth control. Noisy Traces: Nil logged – random swell bursts observed throughout the line. Gun Volume @ SOL: 2500 , EOL: 2500 Gun edit logged : 2 timing errors above 1.5ms, 4 spread errors above 2ms Missed Shots: 2623, 2356, 2355 due to vessel speed variation in swell.
004 Dir 125°	W03ANT1108 P1 SP 1001 - 2944 Complete Data Tape Nos: 35618 - 35621 Streamer depths slightly erratic due to the sea and swell conditions. Streamer depth set to 8.5m to reduce effects of swell interference. Random swell noise bursts observed throughout the line. Weather: Winds SE 25-30 Knots , Sea and Swell: S 2-3m. Noise at SOL: 5µB, EOL: 5-6µB (6Hz lo-cut filter applied) Water Depth: SOL:38.2m, EOL: 53.6m Feather at SOL: -2.1°, EOL : -3.2°, Max: -3.2° Streamer Depth: 8.5 metres due to prevailing swell – acceptable depth control. Noisy Traces: Nil logged – random moderate to strong swell bursts throughout the line. Gun Volume @ SOL: 2500 , EOL: 2500 Gun edits logged : 3 timing errors above 1.5ms – 3 spread errors above 2ms Missed Shots: 1127, 2863 due to vessel speed variation in swell. From SOL to EOL depth controller 4 – no communications
005 Dir 305°	W03ANT1148 P1 SP 2836 - 893 Complete Data Tape Nos: 35622 - 35625 Streamer depths erratic due to the sea and swell conditions. Streamer depth set to 8.5m to reduce effects of swell interference. Random swell noise bursts observed throughout the line. Weather: Winds SE 18-25 Knots , Sea and Swell: S 2-3m. Noise at SOL: 5µB, EOL: 5µB (6Hz lo-cut filter applied) Water Depth: SOL: 56.9m, EOL: 38.96m Feather at SOL: -0.2°, EOL : 0.5°, Max: -2.2° Streamer Depth: 8.5 metres due to prevailing swell – acceptable depth control. Noisy Traces: Nil logged – random moderate swell bursts throughout the line. Gun Volume SOL: 2500 , EOL: 2500. Spread timing error: 2770, 2652, 2614, 2220, 1992, 1702, 1178,898 Gun edits logged : 3 timing errors above 1.5ms – 3 spread errors above 2ms

	Missed Shots: SP 1197, 1735.
006 Dir 125°	<p>W03ANT1036 P1 SP 1001 - 2944 Complete Data Tape Nos: 35626 - 35629 Reasonable balance and control some random swell bursts observed. Fair balance areas were depth control does go out of spec – see below. Max depth 11.2m. Weather: Winds SE 18-25 Knots , Sea and Swell: S 2-3m. Noise at SOL: 5µB, EOL: 5-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 33.6m, EOL: 52.6m Feather at SOL: -1.1°, EOL : -2.0°, Max: -2.3° Streamer Depth: 8.5 metres due to prevailing swell – acceptable depth control. SP 2453-2920 bird 5 deep to 11.2m on streamer 1. Lost comms on bird 4 streamer 2 form SOL to EOL Noisy Traces: Nil logged – random swell bursts throughout the line. Gun Volume SOL: 2500 , EOL: 2500 Good pressure and control. Gun edits logged : 3 spread errors above 2ms SP 1136, 1618, 1662 Missed Shots: SP 1266, 1727 .</p>
007 Dir 305°	<p>W03ANT1140 P1 SP 2836 - 893 Complete Data Tape Nos: 35630 - 35633 Acceptable swell noise, balance and control on line. Weather: Winds SE 18 Knots , Sea and Swell: S 2m. Noise at SOL: 7µB, EOL: 7µB (6Hz lo-cut filter applied) Water Depth: SOL: 56.9m, EOL: 38.96m Feather at SOL: -0.2°, EOL : 0.5°, Max: -2.2° Streamer Depth: 7.5 metres acceptable depth control. Noisy Traces: Nil logged – random swell bursts throughout the line. Gun Volume SOL: 2500 , EOL: 2500. Good pressure and control. Gun edits logged : – 3 spread errors above 2ms SP 2252, 1700, 908 Missed Shots: 2003</p>
008 Dir 125°	<p>W03ANT1100 P1 SP 1001 - 2944 Complete Data Tape Nos: 35634 - 35637 Acceptable swell noise, balance and control on line. Some random bursts of swell noise observed. Weather: Winds W 20 knots , Sea and Swell: W 20 knots. Noise at SOL: 6-7µB, EOL: 6-7µB (6Hz lo-cut filter applied) Water Depth: SOL: 37.4m, EOL: 53.96m Feather at SOL: -0.0°, EOL : 0.9°, Max: -1.7° Streamer Depth: 7.5 metres acceptable depth control. Bird 4 on streamer 4 lost communications for complete line. Unable to replace due to swell at this time. Noisy Traces: Nil logged – random swell bursts throughout the line. Gun Volume SOL: 2500 , EOL: 2500. Good pressure and control. SP 2155 gun 1-11 disabled , gun 1-8 enabled. False autofires displayed on gun 1-11 – electrical short. Gun edits logged : – 4 spread errors above 2ms SP 1705, 2564, 2610, 2666 Missed Shots: NIL</p>
009 Dir 305°	<p>W03ANT1132 P1 SP 2836-893 Complete Data Tape Nos: 35638 - 35641 Acceptable swell noise, balance and control on line. Some random bursts of swell noise observed. Weather: Winds SW 20 knots , Sea and Swell: SSW 2Up to 2 metres. Noise at SOL: 6-7µB, EOL: 6-7µB (6Hz lo-cut filter applied) Water Depth: SOL: 42.2m, EOL: 36.4m Feather at SOL: 0.4°, EOL : -0.4°, Max: 1.1° Streamer Depth: 7.5 metres acceptable depth control. Bird 4 on streamer 4 lost communications for complete line. Unable to replace due to swell at this time. Noisy Traces: Nil logged – random swell bursts throughout the line. Gun Volume SOL: 2500 , EOL: 2500. Good pressure and control. SP 2155 gun 1-11 disabled , gun 1-8 enabled. False autofires displayed on gun 1-11 – electrical short on gun controller – gun not firing (Gun 1-11) Gun edits logged : – 11 spread errors above 2ms SP 2684,2644,2454,2170,2168,2164,1772,1626, 1355,1315,1248 Missed Shots: NIL</p>
010 Dir 125°	<p>W03ANT1004 P1 SP 1022 - 2944 Incomplete - Syntrak hangup Data Tape Nos: 35642 - 35645 Missed SP 1001 –1021 due to a Syntrak hangup and reboot during the run-in to SOL Acceptable swell noise, balance and control on line. Some random bursts of swell noise observed. Weather: Winds SW 10 knots , Sea and Swell: SW up to 2 metres. Noise at SOL: 5-8µB, EOL: 5-8µB (6Hz lo-cut filter applied) Water Depth: SOL: 22.5m, EOL: 53.7m Feather at SOL: -2.3°, EOL : 0.2°, Max: -1.9° Streamer Depth: 7.5 metres acceptable depth control. Bird 4 on streamer 4 lost communications for complete line. Unable to replace due to swell at this time. Noisy Traces: Nil logged – random swell bursts throughout the line.</p>

	<p>Gun Volume SOL: 2500 , EOL: 2500. Good pressure and control. SP 2155 gun 1-11 disabled , gun 1-8 enabled. Gun 1-11 disabled whole line – replaced by gun 1-8 same volume. Gun edits logged : – 3 spread errors above 2ms SP 1477, 1516, 2494. Timing errors: Sp 1131, 2265 Missed Shots: 1676, 1679, 2063 due to vessel speed.</p>
011 Dir 305°	<p>W03ANT1124 P1 SP 2836 - 1678 Incomplete - airleak - circle Data Tape Nos: 35646 - 35648 Stop shooting at SP 1678 due to an air-leak. Circle to complete line. Acceptable swell noise, balance and control on line. Some random bursts of swell noise observed. Weather: Winds SW 8 knots , Sea and Swell: SW up to 1.5 metres. Noise at SOL: 7-8µB, EOL: 7-8µB (6Hz lo-cut filter applied) Water Depth: SOL: 55.6m, EOL: 39.0m Feather at SOL: 1.3°, EOL : -0.2°, Max: 1.3° Streamer Depth: 7.5 metres acceptable depth control. Bird 4 on streamer 4 lost communications for complete line. To be replaced at first opportunity. Noisy Traces: Nil logged – random swell bursts throughout the line. Gun Volume SOL: 2500 , EOL: 2500. Good pressure and control. SP 2155 gun 1-11 disabled , gun 1-8 enabled. Gun 1-11 false autofires throughout the line. Electrical short in the system. Gun edits logged : – 7 spread errors above 2ms SP 2696, 2672, 2458, 2202,1878, 1756, 1735. SP 1845 gun 1-11 disabled. SP 1843 Gun 1-8 enabled Timing errors: Sp 1131, 2265. Missed Shots: 2308, 2307</p>
012 Dir 305°	<p>W03ANT1124 P1 SP 1687 – 836 Second portion to completion. Data Tape Nos: 35649 - 35650 Continuation of line after aborting due to an air-leak on array 1. Now complete.. Acceptable swell noise, balance and control on line. Some slight random bursts of swell noise observed. Weather: Winds SSW 5 knots , Sea and Swell: SSW up to 1.5 metres. Noise at SOL: 5-6µB, EOL: 5-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 38.3m, EOL: 41.0m Feather at SOL: -2.4°, EOL : -0.2°, Max: -2.4° Streamer Depth: 7.5 metres acceptable depth control. Bird 4 on streamer 4 lost communications for complete line. To be replaced at first opportunity. Noisy Traces: Nil logged – random swell bursts throughout the line. Gun Volume SOL: 2500 , EOL: 2500. Good pressure and control. Gun edits logged : – 2 spread errors above 2ms SP 1660, 1310 Timing errors: NIL Missed Shots: 1162</p>
013 Dir 125°	<p>W03ANT1012 P1 SP 1001 – 2836 Incomplete SP 2102-2153 to be reshot Data Tape Nos: 35651 - 35655 Missed SP 2102-2153 due to an on-line hangup with the Spectra. Rebooted the system and continued recording the line to completion. The portion missed will have to be reshot on PGS account at a convenient time later in the survey. Acceptable swell noise, balance and control on line. Some random bursts of swell noise observed. Weather: Winds E 8 knots , Sea and Swell: ESE up to 3.0 metres at times near the end of the line Noise at SOL: 7-8µB, EOL: 7-8µB (6Hz lo-cut filter applied) Water Depth: SOL: 32.1m, EOL: 53.6m Feather at SOL: -1.6°, EOL : 1.0°, Max: 1.0° Streamer Depth: 7.5 metres acceptable depth control. Bird 4 on streamer 4 lost communications for complete line. To be replaced at first opportunity. Noisy Traces: Nil logged – random swell bursts throughout the line. Gun Volume SOL: 2500 , EOL: 2500. Good pressure and control. Gun edits logged : – 5 spread errors above 2ms SP 1224, 1957, 2484, 2834, 2840 Timing errors above 1.5ms: NIL Missed Shots: Data tape 35653 not to be processed. SP 2102-2153 not recorded due to Synttrak</p>
014 Dir 125°	<p>W03ANT1092 P1 SP 1099 – 2836 Incomplete Data Tape Nos: 35656 – 35662 Tapes 35659 – 35660 NOT TO BE PROCESSED. Missed SP 1001-1099 due to Spectra Gun Controller hangup at SOL – reboot and continue down the line. Miss SP 2112-2210 Synttrak crash on-line – reboot and continue down the line. To be reshot. Moderate to strong bursts of swell noise observed along this line. Erratic cable depths. Weather: Winds W 10 knots , Sea and Swell: SW up to 2.0-3.0 metres at times. Noise at SOL: 5-8µB, EOL: 5-8µB (6Hz lo-cut filter applied) Water Depth: SOL: 38m, EOL: 55.0m Feather at SOL: 1.5°, EOL : 0.7°, Max: 1.5° Streamer Depth: 8.5 metres acceptable depth control. Fair but some erratic behaviour in marginal conditions. Bird 1 streamer 2 max depth 11m. Bird 13 streamer 4 max depth 10.7 occasionally. SP 1900-1974 bird 9 on streamer 4 occasionally to 10.2m Noisy Traces: Nil logged – random moderate to strong swell bursts throughout the line. Streamer 2, channels 265-276 failed Harmonic Distortion Tests in Monthly Tests. Unable to replace module at this time due to sea and swell conditions. Streamer 2 channels 254, 247 failed daily tests – edit due to hydrophone leakage.</p>

	<p>Gun Volume SOL: 2500 , EOL: 2500. Good pressure and control. Guns sequence changed on SP ranges 1100-1118, 1120-1134, 1136-1141 Gun edits logged : – 4 spread errors above 2ms SP 1007,1560, 1612, 2666. Timing errors above 1.5ms: SP 1560, 1612, 2666 Missed Shots: 1001-1099 and 2112-2210 both due to instrument and source controller problems.</p>
015 Dir 305°	<p>W03ANTI164P1 SP 2836 - 893 Incomplete – depth edits on cable 4. Data Tape Nos: 35663 - 35666 Moderate bursts of swell noise observed along this line. Very erratic cable depths at head of cable 4. Weather: Winds E 8 knots , Sea and Swell: ESE up to 3.0 metres at times near the end of the line Noise at SOL: 7-8µB, EOL: 7-8µB (6Hz lo-cut filter applied) Water Depth: SOL: 56.1m, EOL: 37.0m Feather at SOL: 1.5°, EOL : 0.7°, Max: 1.5° Streamer Depth: 8.5 metres. Poor depth control - outer streamer 4. Depth controllers 3-7 running very deep and data will have to be edited for the affected traces. Noisy Traces: – random swell bursts throughout the line. Gun Volume SOL: 2500 , EOL: 2500. Good pressure and control. Gun edits logged : – 8 spread errors above 2ms SP 2634, 2060. 1524, 1222, 1188 1132, 1106, 988 Timing errors above 1.5ms: 2634, 2060, 1524, 1222, 1188, 1106, 988 Missed Shots/ No data records: SP 2756 to 2662, 2402 – 2274, 1711, 1172-1174 Data Logger hangup between SP 2402-2274 – data on tape has been checked and verified as good.</p>
016 Dir 125°	<p>W03ANTI1012 P1 SP 2092-2153 Line now complete Data Tape Nos 35667 Weather: Winds 7-15 knots , Sea and Swell: 2-3metres at times. Noise at SOL: 5-6µB, EOL: 5-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 21.4m, EOL: 20m Feather at SOL: 0.3°, EOL : 0.3°, Max: 0.3 ° Streamer Depth: 7.5 to 8 metres - acceptable. Noisy Traces: 300, 312, 13 and 254 intermittent spiking Gun Volume SOL: 2500 , EOL: 2500. Gun edits logged : NIL (Sp 2132 gun 4-6 false auto-fire display – no sign on QC) Timing errors above 1.5ms: SP Missed Shots: NIL</p>
017 Dir 305°	<p>W03ANTI1260 P1 SP 2168 – 893 Complete Data Tape Nos 35668-35670 Weather: Winds 12 knots , Sea and Swell: 2-3metres at times. Noise at SOL: 4-6µB, EOL: 4-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 47.2.4m, EOL: 41.9m Feather at SOL: 0.4°, EOL : 0.1°, Max: 0.4 ° Streamer Depth: 7.5 to 8 metres - acceptable. Streamer 4 bird 6 max depth occasionally 9.1m Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Gun Volume SOL: 2500 , EOL: 2500. Gun edits logged : Delta errors over 2.1ms : 1346, 1122, 1120,1118, 1116, 1114 Timing errors above 1.5ms: SP 1314 Missed Shots: SP 1069, 1068 Extraction Errors: 2129,2124,2006,1979,1976,1479,1444,1355,1353,1325,1311,1296,1290,1284,1279,1204,1093</p>
018 Dir 125°	<p>W03ANTI1044 P1 SP 1001 - 2944 Line now complete Data Tape Nos 35671 - 35674 Weather: Winds 7 knots , Sea and Swell: 2 metres at times. Noise at SOL: 4-6µB, EOL: 4-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 26.7m, EOL: 55.2m Feather at SOL: 0.3°, EOL : 0.3°, Max: 0.3 ° Streamer Depth: 7.5 to 8 metres - acceptable. Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Extraction Errors: 959, 1007, 1015, 1016, 1094, 1096, *098, 1107, 1133, 1134, 1137, 1150, 1794, 2899 Gun Volume SOL: 2500 , EOL: 2500. Gun edits logged : NIL Timing errors above 1.5ms: SP 1004,1855,2071, 2336, 2808, 2822 Missed Shots: NIL: 1097, 2107, 2260</p>
019 Dir 305°	<p>W03ANTI1172 P1 SP 2168 – 893 Complete Data Tape Nos 35675-35678 Weather: Winds 4-9 knots , Sea and Swell: 2 metres at times. Noise at SOL: 4-6µB, EOL: 4-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 58.4m, EOL: 38.2m Feather at SOL: -1.3°, EOL : 0.0°, Max: -1.3 ° Streamer Depth: 7.5 to 8 metres - acceptable. Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Gun Volume SOL: 2500 , EOL: 2500. Gun edits logged : Delta errors over 2.1ms : 2280,1936,1859, 1848, 1851,1703,1643,1601,1505 Timing errors above 1.5ms: NIL</p>

	Missed Shots: SP 1925-1923, 1848,1771,1270, Extraction Errors: 1574, 1568, 1570, 1253, 1239
020 Dir 125°	W03ANT1020 P1 SP 1001 - 2944 Complete Data Tape Nos 35679-35683 Weather: Winds 4-9 knots , Sea and Swell: 2 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 35.3m, EOL: 52.6m Feather at SOL: -1.6°, EOL : 0.7°, Max: -1.6 ° Streamer Depth: 8 metres - acceptable. From SOL to SP 1215 Cable 4 Bird 11 deep to 10m. Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Gun Volume SOL: 2500 , EOL: 2500. Gun edits logged : Delta errors over 2.1ms : 1026, 1998, 2627 Timing errors above 1.5ms: NIL Missed Shots/No data records: SP 1492, 1526, 1574, 1758-1756, 2538, 2921, 2927, 2928 Trace Edits: 1092-1296 to be edited from SP 1215-1427 to replace depth controller cable 4, bird 11 Tape Error: SP 1529
021 Dir 305°	W03ANT1180 P1 SP 2730 - 893 Incomplete – Extraction Errors SP 2780-2475 to be reshot Data Tape Nos 35684-35687 Weather: Winds 10 knots , Sea and Swell: 2 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 57.5m, EOL: 39.2m Feather at SOL: -1.6°, EOL : 0.7°, Max: -1.6 ° Streamer Depth: 8 metres - acceptable. Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Gun Volume SOL: 2500 , EOL: 2500. Gun edits logged : Delta errors over 2.1ms: Sp 1920, 2561. 2174, 1920. Gun Sequence: Guns firing out of sequence and corrected at SP 2762 Timing errors above 1.5ms: 2471 Missed Shots/No data records: SP 2576, 2568, 2562, 2489, 2485, 2484, 2456, 2455, 2454, 2442-2425 No data recorded from SP 2443-2424 due to reinitialising streamer 3 because of multiple extraction errors. (To be confirmed by OBP QC on completion)
022 Dir 125°	W03ANT1052 P1 SP 1001 - 2944 Complete Data Tape Nos 35688 - 35691 Weather: Winds 3-5 knots , Sea and Swell: 2 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 27.3m, EOL: 54.7m Feather at SOL: -1.8°, EOL : -1.1°, Max: 1.8 ° Streamer Depth: 7.5 to 8 metres - acceptable. Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Extraction Errors: NIL Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms: SP 1088, 2007 Missed Shots: 2678, 2679 to be verified by OBP
023 Dir 305°	W03ANT1188 P1 SP 2658-893 Complete Data Tape Nos 35692-35696 Weather: Winds W 5 knots , Sea and Swell: 2 to 3 metres at times. Noise at SOL: 4-6µB, EOL: 4-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 40.7m, EOL: 34 m Feather at SOL: 1.2°, EOL : 0.6 °, Max: 1.2° Streamer Depth: 7.5 to 8 metres - acceptable. Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Gun Volume SOL: 2500 , EOL: 2500. Gun edits logged : Delta errors over 2.1ms : 976 Timing errors above 1.5ms: NIL 2574 Missed Shots: SP 2656, 2655, 2513, 1314,1307, 1306, 1305, 1116-1091 (to be confirmed by OBP) Extraction Errors: 1912, 1908, 1643
024 Dir 125°	W03ANT 1028 P1 1001 – 2944 Incomplete – Syntrak Lock-up SP 2239-2282 Data Tape Nos 35697 - 35703 Weather: Winds 4-9 knots , Sea and Swell: 2 metres at times. Noise at SOL: 4-6µB, EOL: 4-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 29.2m, EOL: 54.1m Feather at SOL: -1.5°, EOL : -0.6 °, Max: -1.5 ° Streamer Depth: 7.5 to 8 metres - acceptable. Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Gun Volume SOL: 2500 , EOL: 2500. Gun edits logged : Delta errors over 2.1ms : 1491, 1545, 1683, 1818, 2291, 2413, 2809, Timing errors above 1.5ms: 1977, Missed Shots: SP 1027, 2373, 2380,2586

	Extraction Errors: SP 1120,1121,1189, 1669,2169,2170,2177,2310,2455 Tape Errors: SP 2239, 2240.2254.2431. Syntrak lock-up at SP 2239-2282 – data to be reshot. (The above tape and extraction errors are to be checked and confirmed by OBP QC)
025 Dir 305°	W03ANT1096 SP 2634 – 893 Incomplete – Syntrak Lock-up 1976 - 1959 Data Tape Nos 35704 - 35707 Weather: Winds 4-9 knots , Sea and Swell: 1.5 metres at times. Noise at SOL: 4-6µB, EOL: 4-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 54.8m, EOL: 39.2 m Feather at SOL: -5.0°, EOL : 0 °, Max: -5.6 ° Streamer Depth: 7.5 to 8 metres - acceptable. Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Gun Volume SOL: 2500 , EOL: 2500. Gun edits logged : Delta errors over 2.1ms : 2577,2515,2452,2168,1486,1222 Timing errors above 1.5ms: NIL Missed Shots: SP 2380, 2229, 2152,2151,2073,2055.2054, 2051, 2050, 1976-1959, 1097 Extraction 2385,2363,24343,2274,2155,2153,2150,2149,2096,2084,2083,2079,2078,2074,2056,2049,2048,2047, 2046 Syntrak Crash at SP 1975 – 1959 subject to confirmation by OBP QC, Errors:
026 Dir 125°	W03ANT1020 II SP 1001 - 2944 Infill -Complete Data Tape Nos 35708 - 35712 Weather: Winds 3-5 knots , Sea and Swell: 2 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 18.8m, EOL: 53.5m Feather at SOL: -1.4°, EOL : 0.8°, Max: 1.9 ° Streamer Depth: 7.5 to 8 metres - acceptable. Noisy Traces: 204, 300, 299, 312, 13 noisy and 254 intermittent spiking Extraction Errors: 1009, 1010, 1012, 1014, 2181 Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms: SP 1542, 2077, 2527, 2843 Missed Shots: 1005, 1006, 1008, 1009, 1010,1012,1014 to be verified by OBP Tape Errors: 2375 No Data Records: 1013, 1011, 1020,1097, 2369,2370,2376,2453,2840 This line was shot a part infill and part acquiring non-chargeable reshoots caused by Syntrak lockups on earlier lines.
027 Dir 305°	W03ANT1196 II SP 2648 - 2556 Line Aborted due to failure of streamer- TO BE RESHOT Data Tape Nos 35713 – 35714 Not to be processed Weather: Winds 3-5 knots , Sea and Swell: 2 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) ALL DATA SCRATCHED - NOT TO BE PROCESSED
028 Dir 305°	W03ANT1196 I2 SP 2598 - 893 Infill -Complete Data Tape Nos 35715 - 35718 Weather: Winds 4-8 knots , Sea and Swell: 2.5 metres at times. Noise at SOL: 5µB, EOL: 5µB (6Hz lo-cut filter applied) Water Depth: SOL: 47.3m, EOL: 39m Feather at SOL: -1.9°, EOL : 1.6°, Max: 1.9 ° Streamer Depth: 7.5 to 8 metres - acceptable. Extraction Errors (Streamer 3): 1692, 1559, 1528, 1510, 1368, 1314, 1276, 1190, 1091 Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms: SP 1926, 1416 Array Spread Errors above 2.0ms: 2488, 2366,2072,1988, 1357,1334,1244,1239,1194,1148,1114,895 Missed Shots: 2518, 2517 to be verified by OBP Tape Errors: NIL
Seq 029 Dir 125°	W03ANT1060 P1 SP 2544 -893 Incomplete – Syntrak and Tape Errors at SOL Data Tape Nos 35719 - 35724 Weather: Winds 5-12 knots , Sea and Swell: 2-3 metres at times. Noise at SOL: 5-6µB, EOL: 5-6µB (6Hz lo-cut filter applied) Low level tugging on all streamers observed in large side swell Water Depth: SOL: 36.6m, EOL: 53.1m Feather at SOL: -1.8°, EOL : 1.8°, Max: 1.8 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Extraction Errors Streamer 4: 1368, 1433, 1676, 1695, 2862 Timing errors above 1.5ms and Spread Errors: SP 1038, 1374,2076,2182,2346,2418 No Data Records: 1255, 1257, 1259, 1602, 1797, 2388, 2390, 2391 (to be checked and confirmed) Syntrak Log Corrupted Shots: 2486-2359, 1759, 1758,1636-1612, 1335 (to be checked and confirmed) Tape Errors: 1021 Tape unit 1, 1029 tape unit 2 No data from SP 1090-1230 Syntrak.Tape deck problems
030 Dir 305°	W03ANT1204 P1 SP 2544 -893 Complete Data Tape Nos 35725 - 35727

	<p>Weather: Winds 5 knots , Sea and Swell: 2-3 metres at times. Noise at SOL: 5-6μB, EOL: 5-6μB (6Hz lo-cut filter applied) Low level tugging on all streamers observed in large side swell Water Depth: SOL: 46m, EOL: 41m Feather at SOL: -3.8°, EOL : -0.2°, Max: -4.5 ° (Partially induced when steering for coverage) Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Extraction Errors: 2284, 2234,1807, No data records: 1440, 1439, Timing errors above 1.5ms and Spread Errors: SP 2232, 2226, 1958,1708,1436,1026 Array volume change/Gun swaps: 981, 975, 974 Syntrak Log Corrupted Shots: 2486-2359, 1759, 1758,1636-1612, 1335 (to be checked and confirmed)</p>
031 Dir 125°	<p>W03ANT1068 P1 SP 1001-2944 Complete Data Tape Nos 35728 - 3571231 Weather: Winds 5-10 knots , Sea and Swell: 2-3.5 metres at times. Noise at SOL: 4-6μB, EOL: 4-6μB (6Hz lo-cut filter applied) Water Depth: SOL: 35.1m, EOL: 53.0m Feather at SOL: - 0.8°, EOL : 0.4°, Max: 1.3° Streamer Depth: 8 metres - acceptable. Gun Volume SOL: 2500 , EOL: 2500. Extraction Errors on streamer 4: 1282 Timing errors above 1.5ms and Spread Errors: SP 2064, 1380 Array Volume changes-Gun replacement SP 1433, 1434, 1513, 1515 No Data Records: 1038, 1603, 1988(to be checked and confirmed)</p>
032 Dir 305°	<p>W03ANT1212 P1 SP 2525 - 893 Incomplete Syntrak and Tape Deck Errors Data Tape Nos 35732 - 35736 Weather: Winds 5-10 knots , Sea and Swell: 2-3.5 metres at times. Noise at SOL: 4-6μB, EOL: 4-6μB (6Hz lo-cut filter applied) Water Depth: SOL: 35.1m, EOL: 53.0m Feather at SOL: 0.6°, EOL : 1.2°, Max: -1.2° Streamer Depth: 8 metres - acceptable. Gun Volume SOL: 2500 , EOL: 2500. Extraction Errors on streamer 4: 2508, 1975, 5073, Timing errors above 1.5ms and Spread Errors (2.1ms): SP 2314, 2070, 1670 Array Volume changes-Gun replacement SP 1433, 1434, 1513, 1515 No Data Records: 1929 – 1773 (to be checked and confirmed) Tape Deck and Syntrak lock-up Single no data records: 2423-2315, 2192, 1928-1772, 1294, 1191, 1190, 1116 SP 1929 Tape unit 2 error – missing data blocks</p>
Seq 033 Dir 125°	<p>W03ANT1076 P1 SP 1003 - 2944 Complete Missed the first 2 shotpoints due to a Syntrak lock-up at the SOL Data Tape Nos 35737 - 35741 Weather: Winds 6-12 knots , Sea and Swell: 2 to 2.5metres at times. Noise at SOL: 4-5μB, EOL: 4-5μB (6Hz lo-cut filter applied) Low level tugging on all streamers observed in large side swell Water Depth: SOL: 37.6m, EOL: 53.6m Feather at SOL: -1.2°, EOL : 0.4°, Max: 1.3 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Extraction Errors Streamer 4: 2406 Timing errors above 1.5ms and Spread Errors: SP 1114, 1133, 1406, 1491, 2407 No Data Records: 1542. 1579-1577(to be checked and confirmed)</p>
Seq 034 Dir 305°	<p>W03ANT 1220 P1 SP 2478 - 893 Complete Data Tape Nos 35742 – 35745 Weather: Winds 6-12 knots , Sea and Swell: 1.5 to 2.5 metres at times. Noise at SOL: 4-5μB, EOL: 4-5μB (6Hz lo-cut filter applied) Low level tugging on all streamers observed in side swell Water Depth: SOL: 42.7m, EOL: 40.7 m Feather at SOL: -0.5°, EOL : 1.1°, Max: 1.1 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Sp 2457-2456 guns firing out of sequence SP 1513 array volume change Extraction Errors Streamer 4: SP 2054 SP 1515 shot navigation header. Timing errors above 1.5ms and Spread Errors: SP 2237, 1644, 1615, 1584,</p>
Seq 035 125°	<p>W03ANT 1084 P1 SP 1001 - 2944 Complete Data Tape Nos 35746 – 35749</p>

	<p>Weather: Winds 8-12 knots , Sea and Swell: 1.75 to 2.5 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Low level tugging on all streamers observed in side swell Water Depth: SOL: 31.1m, EOL: 53.9 m Feather at SOL: -1.0°, EOL : -1.0°, Max: -1.0 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Sp 1253-1254 guns firing out of sequence Extraction Errors Streamer 4: SP 1602, 1722. SP 2043 incorrect file number in Synttrak log,,1199 should be 1193 Timing errors above 1.5ms and Spread Errors: SP 2237, 1644, 1615, 1584, No Data Records: 2272, 2426, 2607-2726 (to be confirmed by OBP – probably data logger error)</p>
Seq 036 Dir 305°	<p>W03ANT1228 P1 SP 2425 - 893 Complete Data Tape Nos 35750 - 35752 Weather: Winds 8-12 knots , Sea and Swell: 2 to 2.25metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Low level tugging on all streamers observed in large side swell Water Depth: SOL: 41.9m, EOL: 41.1m Feather at SOL: -2.6°, EOL : -2.1°, Max: -2.6 ° Streamer Depth: 8 metres - acceptable. Gun Volume SOL: 2500 , EOL: 2500. Extraction Errors : NIL Timing errors above 1.5ms and Spread Errors: SP 2382, 2057, 1524, 1492 No Data Records: 2322, 1322, 1319 (to be checked and confirmed)</p>
Seq 037 Dir 125°	<p>W03ANT1084 I1 SP 1001 - 2944 Complete Data Tape Nos 35753 – 35756 Weather: Winds 8-10 knots , Sea and Swell: 2.0 to 2.5 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Low level tugging on all streamers observed in large side swell Water Depth: SOL: 35.5m, EOL: 63.0 m Feather at SOL: -1.7°, EOL : -0.9°, Max: -1.7 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms/Misfires/Delta Spread Errors above 2.1ms: 1285, 1757 No data records: 2102, 2103</p>
Seq 038 305°	<p>W03ANT 1236 P1 SP 2372 - 893 Complete Data Tape Nos 35757 – 35759 Weather: Winds 6knots , Sea and Swell: 1.5 to 2.0 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Low level tugging on all streamers observed in large side swell Water Depth: SOL: 48.2m, EOL: 39 m Feather at SOL: -0.8°, EOL : 0.4°, Max: -0.9 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms and Spread Errors: SP 2152</p>
Seq 039 125°	<p>W03ANT 1236 I1 SP 1001 - 2948 Complete Data Tape Nos 35760 – 35763 Weather: Winds 8-12 knots , Sea and Swell: 1.5 to 2.0 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Low level tugging on all streamers observed in large side swell Water Depth: SOL: 39.5m, EOL: 54.2 m Feather at SOL: -1.4°, EOL : -2.2°, Max: -2.2 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms and Spread Errors: SP 1061 No Data Records: SP 2655-2939, 2942. 1129, (to be checked and confirmed by OBP)</p>
Seq 040 Dir 305°	<p>W03ANT1180 P2 SP 2588 – 2415 Now Complete Data Tape Nos 35764 - 35764 Weather: Winds 5-9 knots , Sea and Swell: 2 to 2.25metres at times. Noise at SOL: 2-4µB, EOL: 2-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 41.3m, EOL: 42.6m Feather at SOL: -4.4°, EOL : -3.4°, Max: -4.4 ° Streamer Depth: 8 metres - acceptable. Gun Volume SOL: 2500 , EOL: 2500. Extraction Errors : NIL Timing errors above 1.5ms and Spread Errors: SP 2473 No Data Records: 2475, 2474, 2467 (to be checked and confirmed)</p>

Seq 041 Dir 125°	W03ANT 1196 P2 SP 2106 – 1949 Now Complete Data Tape Nos 35765 – 35765 Weather: Winds 5-10 knots , Sea and Swell: 2.0 to 2.5 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 41.4m, EOL: 44.2 m Feather at SOL: -1.4°, EOL : -2.4°, Max: -2.4 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms/Misfires/Delta Spread Errors above 2.1ms: NIL No data records: 2080-2281 displayed on data logger but incorrect (confirmed by OBP QC)
Seq 042 305°	W03ANT P1 SP 1001 - 2948 Complete Data Tape Nos 35766 – 35768 Weather: Winds 6-12 knots , Sea and Swell: 1.5 to 2.5 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 42.7m, EOL: 40.7 m Feather at SOL: -0.5°, EOL : 1.1°, Max: 1.1 ° Streamer Depth: 8 metres - acceptable. Gun Volume SOL: 2500 , EOL: 2500. Sp 2457-2456 guns firing out of sequence Sp 1513 array volume change Extraction Errors Streamer 4: SP 2054 Timing errors above 1.5ms and Spread Errors: SP 2237, 1644, 1615, 1584, Bad Data Records: 1129, 1330-1436, 1780-1906, 2374 (checked and confirmed acceptable)
Seq 043 125°	W03ANT1116 P3 SP 1001 - 1791 Now Complete Data Tape Nos 35769 – 35770 Weather: Winds 12 knots , Sea and Swell: 1.5 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 37m, EOL: 35.7 m Feather at SOL: -1.6°, EOL : 1.1°, Max: 1.6 ° Streamer Depth: 8 metres - acceptable. Gun Volume SOL: 2500 , EOL: 2500.
Seq 044 305°	W03ANT1212 P2 SP 1938 - 1763 Non- chargeable reshoot -Complete Data Tape Nos 35771 – 35771 Weather: Winds 6-10 knots , Sea and Swell: 1.5 to 2.0 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 46.9m, EOL: 44.1 m Feather at SOL: -0.1°, EOL : 0.1°, Max: 0.1 ° Streamer Depth: 8 metres - acceptable. Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms and Spread Errors: NIL Bad Data Records: 1830 streamer 4. (to be checked and confirmed acceptable)
Seq 045 305°	W03ANT1252 P1 SP 2265 - 893 Complete Data Tape Nos 35772 – 35774 Weather: Winds 8 knots , Sea and Swell: 1.5 to 2.0 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 45.2m, EOL: 41.0 m Feather at SOL: 0.0°, EOL : -0.9°, Max: -3.0 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms and Spread Errors: SP 2253 Bad Data Records: 2240 (to be checked and confirmed acceptable)
Seq 047 Dir 125°	W03ANT 1092 P2 SP 1001 -1109 Reshoot – now complete Data Tape Nos 35776 – 35776 Weather: Winds 8 knots , Sea and Swell: 1.5 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 38m, EOL: 37.9 m Feather at SOL: 0.7°, EOL : 1.0°, Max: 1.0 ° Streamer Depth: 8 metres - acceptable. Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms/Misfires/Delta Spread Errors above 2.1ms: NIL No data records: (to be confirmed by OBP QC)
Seq 048 305°	W03ANT1252 II SP - 2319 - 893 Complete Data Tape Nos 35777 – 35779 Weather: Winds 12 knots , Sea and Swell: 1.5 metres at times. Noise at SOL: 4-5µB, EOL: 4-5µB (6Hz lo-cut filter applied) Water Depth: SOL: 46.3m, EOL: 42.8 m Feather at SOL: 2.7°, EOL : 1.8°, Max: 3.6 ° Streamer Depth: 8 metres - acceptable.

	Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. Timing errors above 1.5ms and Spread Errors: SP 2104, 1835, 1731, 1541,.
Seq 049 125°	W03ANT1060 P2 SP 1001 - 1240 Reshoot – Now Complete Data Tape Nos 35780 – 35780 Weather: Winds 10-15 knots , Sea and Swell: 1.5 to 2.25 metres at times. Noise at SOL: 5µB, EOL: 4-6µB (6Hz lo-cut filter applied) Water Depth: SOL: 35.1m, EOL: 33.2 m Feather at SOL: 0.0°, EOL : 0.5°, Max: 0.6 ° Streamer Depth: 8 metres - acceptable. Noisy Channel: 300, 123, 299, 312 Gun Volume SOL: 2500 , EOL: 2500. SP 1188-1189 guns firing out of sequence

APPENDIX P: STOP CARDS AND HAZARD REPORTS

35 STOP CARDS ISSUED TO 9TH NOVEMBER 2003

Note reference numbers listed refer to PGS HSE reporting systems

110	23	23-Oct-03	3	Storm door frame stbd side 4th deck low-head injury risk.	Fitted reflective danger tape to make workmates aware of the hazard.	IR	closed
111	23	23-Oct-03	3	Entrance to E/R from port side 4th deck - Plate painted green and can not be seen in dark area.	Fitted reflective tape so it can be seen.	IR	closed
113	16	24-Oct-03	3	While attending a toolbox meeting on the bridge for workboat operation, was told by Ch Mate Adviser and PC that seaman involved in launching operation would not be involved in toolbox as this has been the norm on this vessel. This should never be the case! Good communication should always start at the top and filter down to all personal involved in operation.	Bosun and AB to be at pre-launch meeting	R. Simm	closed
115	16	28-Oct-03	2	Washing machines in room with dryers playing up. Takes around 3 hrs to do a 40 min cycle. Water pressure low or machines' filters blocked.	Pull of water hoses to investigate water flow problems are cleaned is better	Ch Cook	closed
116	16	28-Oct-03	2	Stainless steel fridge in Galley too cold. Freezing all food spoiling the products. Adjust the thermostat somehow.	New thermostat to be ordered or technician	Ch Cook	Open
117	16	31.Oct.03	2	Floor mats on entrance to Accommodation on deck 4 are very "ratty" and very slippery (look very bad too). Suggestion to improve: rubber backed mats should be ordered.	Replaced with new	Nav	Closed
119	16	31.Oct.03	3	Several crew members sent to work @ crew change with no idea of what was happening, i.e. -no agent of contact; no details of where to fly after Melbourne. Is it so hard to notify crew by mail or phone call of arrangements at crew change	To be discussed at SM	Nav	Open
120	23	3-Nov-03	2	Noticed while vessel was moving around a lot and water on main deck: slip hazard. To prevent slip hazard in rough seas have walkways painted with anti-slip paint (paint with sand). This would increase safety of vessel personnel	Next time deck painted, will add sand. (needs to be ordered)	C/St	Open
121	8	3-Nov-03	3	Hygiene concerns: some of the crew sine in the mess room with dirty coveralls on. Our policy on board Orient is no coveralls in the Mess room. All crew should follow this policy.	to be discussed at SM	Int	Open
122	2	2-Nov-03	2	Gunner using buddy system and PPE while working aloft (good effort but PPE overdated and incorrect. Gunner working aloft w/safety belt - belts should have been destroyed years ago.	Immediate action: ch.gunner sent to stop work. - prevent recurrence: new belt ordered/old one destroyed.	Nav	Open
123		11/3/2003	3	1) While attending fire drill noticed medical team mustered in wrong position. Medical team or emergency team should meet at hospital and report to medic, no in heli-reception. 2) Medic shall carry aradio at all times as an emergency can happen any time. I think a rehash of procedure for medical emergency team should be revised. To make for a reliable and efficient team.	to be discussed at SM	C/St	Open
124		11/3/2003	2,3	Location of aerosol can Disposal: unable to locate disposal bin/area for aerosol cans. Have asked people and have been directed to various locations, but no bin. Require adequate signs to locate this disposal area.		Nav	Open
125	11	11/3/2003	2	Unsafe condition: Laundry, Level 2: floor covered with water possivly from leaking washing machine. Repair leak in Machine.		Nav	Open
126	11	11/4/2003	2	Clothes Dryers: a major cause of ship fires isdue to dryers. The filters of which clog up. The ones on board have no signs, indicating that they should be cleaned before use. I tried to clean one filter but found it almost impossible to remove dirt. Require signs to be posted regarding this hazard.		Nav	Open
127		11/4/2003		In order for HSE practices to be understood and properly utilised it has to be accessible and easy to use. This is an underslood fact that cannot be denied. We have a 423-page manual that has no links or page numbers. To find something you have to wade through every page of the document - this is totally unacceptable. Documents affected: EAYYVES00, EAYYOR100.		Nav	Open
128		11/4/2003	3	Muster stations not shown on safety plan. Use of alternative muster station should be made a lot clearer. Muster station should be clearly marked.		Nav	Open
129		11/5/2003	5	Plastic cups. I notice that foam cups are being put in the "combustible" bin. These are plastic and should be in plastics. Require: 1) People to be more diligent in their disposal habits. 2) Remove these plastic cups from use as burning them causes gases that harm the ozone.		Nav	Open
130	6		3	ER Chemical Locker: 1) No MSDS in English 2) No PPE (face mask, gloves). PPE to be supplied. MSDS to be photocopied from original.		Eng	Open
131	6	11/4/2003	3	Engine Control Room is a designated smoking area!!! There are no smoking persons who are exposed to cigarette smoke. Suggest removing Smoking Area sign and place No Smoking.		Eng	Open

132		11/5/2003	3	Addition to segregating waste - Plastic, Glass, Cans. What about recycling, i.e. crushing aluminium cans, grinding glass, grinding plastic. Bag each of this individually and recycle. It would require the purchase of suitable equipment. But would be worth it.		Nav	Open
133		11/5/2003	2	The trash bin in the common toilet on Deck 2 needs to be bigger obviously as it overflows with used paper towels	Room is being cleaned 2 x daily and should handle bin	Seisproc	Closed
134		11/5/2003	2	Safety Plans posted through the ship are inconsistent with each other and are in most cases incorrect. Deck numbers do not match deck designation on plan. Have spoken to captain - plans need to be upgraded.		Nav	Open
135		11/5/2003	2	Cabin Safety Plans. Most are faded and poor. None have the MOB alarm signal alarm. Spoken to Captain - plans need to be upgraded.		Nav	Open
136		11/5/2003	2	Deck Numbering: In stairwell deck numbering is high up on the bulkhead. If area filled with smoke then numbers may not be able to be seen. Have spoken to Captain and suggested that numbering be located at the bottom of bulkheads for clear viewing.		Nav	Open
137		11/5/2003	2	Emergency Plan The coloured emergency plan does not contain the MOB alarm on details to go with it. As this is an emergency plan it should contain this information. Spoken to captain.	Spoken to captain	Nav	Open
138	14	11/6/2003	2	Plotter in Nav Pros. Office is set up high on the bulkhead. To change Paper/pens will require to climb on desk. Not a good idea, especially in this weather. Plotter needs to be mounted lower on the bulkhead as they are designed for below eye level use.		Nav	Open
139	6	11/6/2003	2	Fire blanket missing. Found one used for a job. Fire fighting equipment should not be removed and used for other purposes. Returned to the designated area (pocket) and person using fire blanket educated with possible consequences.	Returned to the designated area (pocket) and person using fire blanket educated with possible consequences.	Eng	Closed
140	11	11/6/2003	2	Location of dryers, Deck 3: Dryers are located behind the door. A person using the port one need to close the door. This puts him in position where someone opening the door can cause injury. Dryers need to be located on bulkhead above ironing board.	Crew need to take some care themselves, nothing wrong with current system	Nav	Closed
141	11	11/6/2003	2	Washing machine, Laundry Deck 2: With ship rolling badly one machine sliding from bulkhead to bulkhead. Called seamen who lashed machine temporarily. Machine requires to be restrained in fixed position. Amazing this has not been seen before.		Nav	Open
142	19	11/7/2003	2	The starboard side aft hinge of the nop hood on the Engine of the work boat is broken.		Seisproc	Opened
143	12	11/7/2003	2	The screen on the Birdge PC was so blurry and distorted that I could not read the set up properties. People were still working with this everyday. Management (here Maritime/DMNG needs to provide a minimum number of spars to avoid such problem).	Replaced with 2nd hand one borrowed from PGS stuff. New monitor on order	Seisproc	Closed
144	14	07-Nov-03	5	QC Department moved all tape drivers out of their working area into separate room. Very high frequent noise source (copy tape drivers) placed next to observers desk. Observer's sitting next to this noise source for 12 hours each shift. Tape drives should be moved or at least mounted into a proper rack, same as recording tape drives or better.		Obs	Opened
145	17	11/8/2003	2,3	Diesel Compressor emergency shut down buttons are located in Diesel Compressors Room. In case of thick smoke or fire in this room or if access is impossible for some other reason, we have no chance of shutting down these units. It is necessary to arrange additional emergency buttons somewhere outside Diesel Compressor room.		Ch.El.	opened
148	8	11/9/2003	2	Extremely slippery galley deck. Especially when wet. Mention to catering to use caution. Approached Safety Officer, Bosun, Mate to source. Extra non slip product to be placed on deck as when vessel rolls extremely dangerous.	Matter is in hand & product being ordered.	P.Morgan	Closed
149	16	11/9/2003	5	Person using fingers to lift salad food & replacing unwanted food in press.	Told person to use tongs or spoons as this stops the spread of disease & persons getting in agreed.	P.Morgan	Closed

25 - PGS HAZARD REPORTS

Note reference numbers listed refer to PGS HSE reporting systems

134	31-Oct-03	Self closing cocks on sounding pipes missing and many pipes left open. Trip hazards from water blaster hoses.	Boatswain	week 44	closed
135	01-Nov-03	Heli Deck: Remove AC unit and seismic reel stand when weather permits.	Capt / Ch.Eng	week 45	closed
136	01-Nov-03	Improve security of ladder stored next to exhaust pipe	Ch.Mate	week 44	closed

137	01-Nov-03	WB roller was left in the lithium battery store. Only lithium batteries to be stored in this storage.	WB coxswain	week 44	closed
138	01-Nov-03	Fan was blocking closing of escape hatch in cable repair. This was sorted during the inspection	Ch.Obs	week 44	closed
139	01-Nov-03	Gangway aft of cylinder 6 in the engine room has a loose floor grid which needs to be sorted.	Chief Engineer	week 44	closed
140	01-Nov-03	Put up sign on entry to paint store to remind about switching on ventilation fan before entry.	Ch.Mate	week 44	closed
141	3-Nov-03	3 x Public toilets onboard are used daily quite frequently, therefore twice a day cleaning is recommended. All areas of entire WC need more cleaning attention.	Ch. Stwd	week 45	closed
142	3-Nov-03	Water filter in galley needs regular changeout for purified water. Should be TM master item.	Ch. Mate	week 45	closed
143	3-Nov-03	Tiles near the sink in the main galley are slippery. In fact, tiles on the galley deck are lifted or loose and slippery everywhere. It makes the whole area hazardous.	Nordic Maritime	week 45	
144	3-Nov-03	There is a need for more/better metal pegs on the cooking plates, to secure pots in rough weather.	Engineers	week 45	open
145	3-Nov-03	There is a need for better/more light in the galley	Electrician	week 45	closed
146	3-Nov-03	The wooden cupboards in the mess are old and should be replaced by stainless steel ones. We need a better layout that fits a mess used by more than 50 people 24hours/24. The same in the galley. The wooden cupboards are now worn out and deserve a decent retirement in a hot place like the incinerator	Nordic Maritime	Dry Dock	
149	3-Nov-03	There are no emergency flash lights near the smoke hoods.	Ch. Mate	week 45	on order
150	3-Nov-03	The shelves in the fridges need to be better secured. Old wires and planks need to be replaced by proper metal ones so than cans or boxes are properly held in place. A general refit of those shelves is needed.	Ch. Stwd	week 46	open
151	3-Nov-03	There is a lot of ice on the pipes and walls in the fridges. This drips on the floor, making the whole area very slippery. Proper insulation needs to be added where appropriate to avoid this.	Chief Engineer to investigate	week 45	open
152	3-Nov-03	For the first time there were no cockroaches visible anymore. However we see a small one now and then on the vessel (killed 2 myself this week). Is there any extermination planned at next port call?	Captain	Dry Dock	Closed
153	07-Nov-03	Fire Extinguishers need to show the correct monthly inspection date (port side).gund	Chief Officer	Week 46	open
154	07-Nov-03	Identification tags placed on Emergency switches (winch stop button) Such as "Push for Emergency stop of winch"	Gun Mech	Week 46	open
155	8-Nov-03	Dry store, a lot of wire used to secure bars to hold items in shelves, wire is twisted off and sticks out, is a hazard. To be replaced with cableties/bolts	Ch Stwd/Bosun	Week 46	open
156	8-Nov-03	All cabins require thorough cleaning, windows, cupboard tops, basins, showers scrubbed, vacumed, should be a weekly routine	Ch Stwd	Week 46	open
157	8-Nov-03	Deck 3 public toilet, deck requires scrubbing, make part of weekly clean routine	Ch Stwd	Week 46	open
158	9-Nov-03	Russian version of Gun Deck Procedures and work instructions requires updating	Interpreter	Week 46	open
159	9-Nov-03	Update EEBA info on Safety plan deck 2	Ch Mate	Week 46	open
162	9-Nov-03	The Russian version of the Orient JSA's requires reviewing and updating where necessary	PC/Interpreter	Week 46	open