T/18P – BASS BASIN AUSTRALIA
2002 SHELDUCK SEISMIC SURVEY
FINAL ACQUISITION REPORT

CONTENTS

PAGE

A P P E N D I C E S

GENERAL

1. DAILY LOGS

2. LINE SUMMARY

3. LINE QC

4. ENERGY SOURCE DROP OUT SPECIFICATION

5. ORIGINAL DATA ACQUISITION PROGRAM

6. WEATHER REPORTS

7. SAFETY ACCIDENTS / NEAR MISS REPORTS

POSITION

8. NAV QC LOG

9. PROFILES LOG

10. PRODUCTION LOG

PROCESSING

11. NAV PROCESSING SUMMARY LOG

12. HARDWARE

13. SOFTWARE

14. LINE LOG SPREADSHEET

1 INTRODUCTION

The Shelduck Seismic Survey was conducted by Fugro-Geoteam AS. as an exclusive 2D survey within permit T/18P in the central Bass Straight between Tasmania and the Victoria, Australia. The operator for the survey was Origin Energy Resources Ltd. The vessel was the RV Geo Arctic. Specifications for the vessel are found in Appendix 4.

The survey consisted of 20 lines of average length 20km giving a full fold coverage of 375 km acquired during June 2001.

The "Marine Specifications" document contains guidelines for the performance of this project.
Origin Energy Resources Ltd. supplied an Environment plan and Fugro Geoteam Ltd had a MEDEVAC and Emergency Response Plan in place for the area.

A separate HSE Plan was made for this project, and was forwarded to the authorities in Tasmania and Victoria.

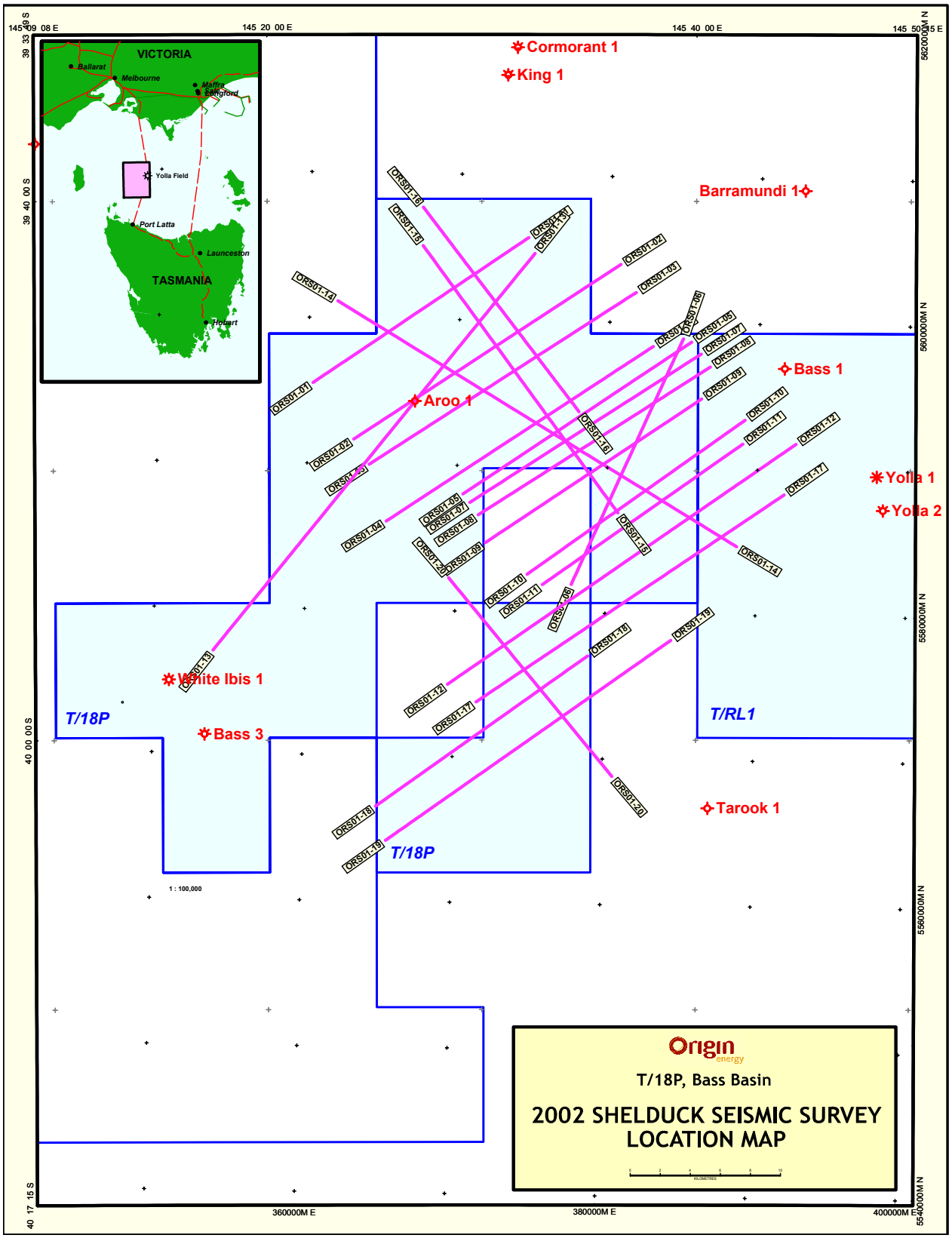
The Client had a Representative onboard during the acquisition.

1.1 SCOPE OF WORK

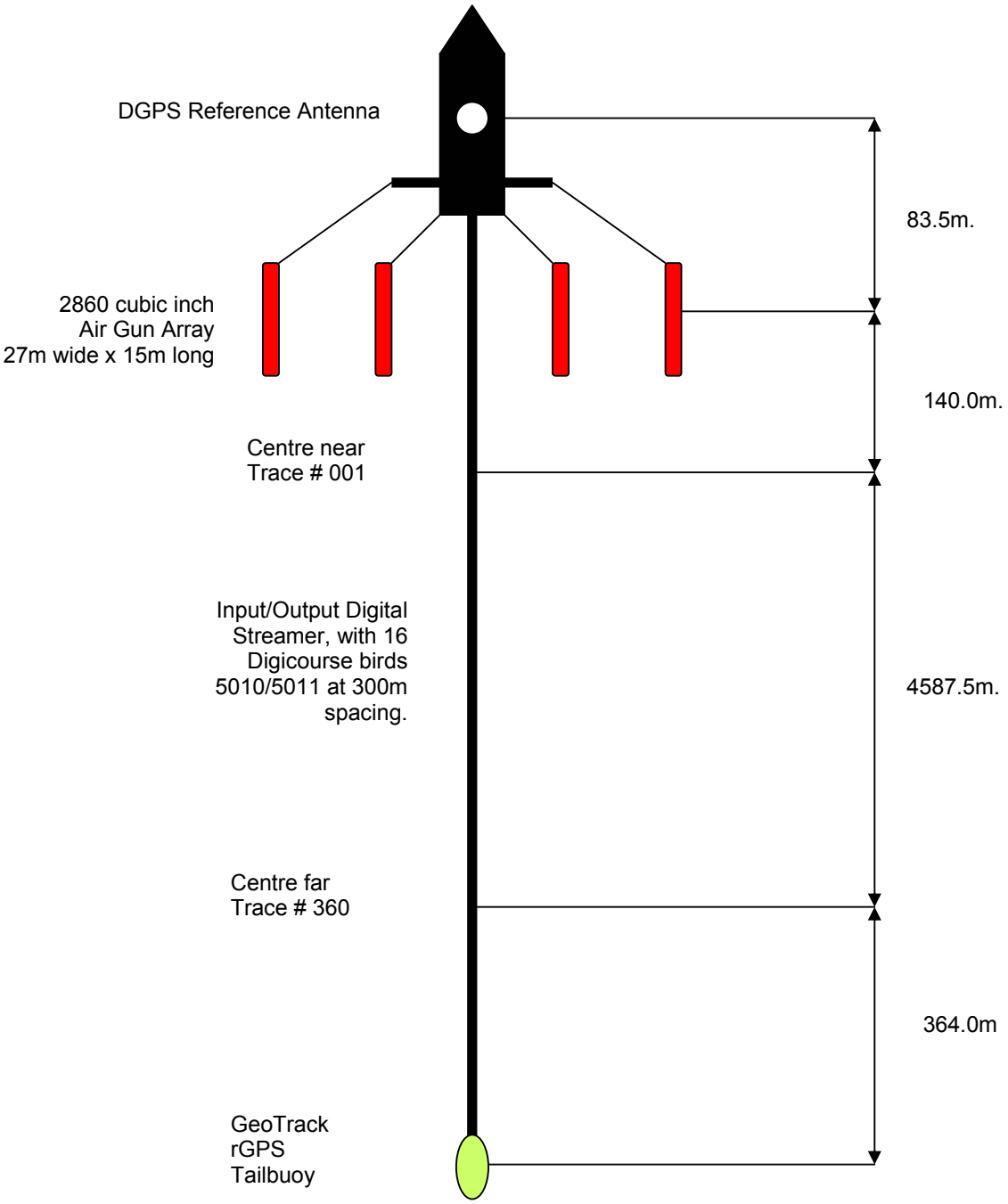
2D seismic survey acquisition:

Client:	Origin Energy Resources Pty. Ltd.
Location:	Permit T/18P,Bass basin, Tasmania
Project no:	34834
Survey size:	375km full fold
Vessel:	RV Geo Arctic
Water depth:	70-90m
Fixed obstructions:	None known.
Number of lines:	20

1.2 WORK AREA / SURVEY PROGRAM



1.3 SYSTEM LAYOUT



All Dimensions are Nominal

1.4 PLANNING AND PREPARATION - TIME SCHEDULE

Geo Arctic had a planned port call at Burnie, Tasmania for the purpose of re-supply and partial crew change on the 30th May. Origin's representative together with several Fugro Geoteam personnel were to join the vessel and it had been originally intended for the vessel to proceed directly to the Shelduck Survey site to begin acquisition, but due to a recent cable break incident this plan was changed.

The port call and pick up of the Origin Energy rep proceeded as planned. After this the plan was changed for the vessel to steam out and find sheltered waters in the lee of King Island and make all necessary cable repairs before continuing on to her previous work area to complete the last two lines to the SW of King island. Geo Arctic would then steam back in to the Bass straights in early June to begin the Origin Resources Ltd. project.

On completion of the acquisition the client's representative was to be then put ashore at the first opportunity together with a copy of the data before Geo Arctic could return to work on other projects in the area.

1.5 OTHER DOCUMENTATION

The following documentation is referred to directly or indirectly and was available throughout the survey, to ensure that all information, specifications, guidelines and agreements for this project were available :

- QC Specifications
- HSE Plan
- MEDEVAC Plan
- Fugro-Geoteam AS' QA and HSE documentation.
- Health, Safety and Environmental related documents according to contract.

2 ACQUISITION PARAMETERS

Fugro-Geoteam AS ensured that the equipment in use met the manufacture specifications, and also met Fugro-Geoteam's quality requirement.

2.1 DEFINITION

Acquisition mode	:	Single vessel
Configuration	:	Single streamer, single source
Shot interval	:	18.75 m.
CDP spacing	:	6.25 m.
Coverage	:	120 full fold

2.2 SEISMIC PARAMETERS.

2.2.1 Seismic recording systems

Recording type	:	I/O MSX
Recording length	:	5 seconds
Sampling rate	:	2ms
Low-cut filter	:	4Hz, 12dB/Oct
Hi-cut filter	:	206Hz , 264dB/Oct
Format	:	SEG-D Demux
Tape media	:	3590
Source type	:	Sodera G guns.
Recording mode	:	Single source

2.2.2 Seismic streamer

Streamer type	:	I/O MSX 24 bit digital
Streamer length	:	4600m
Nominal streamer depth	:	7.5m (but can be dropped to 10m with approval)
Near offset	:	150m
No of groups	:	368
Group interval	:	12,5m
Group length	:	17,55m
No of birds	:	17

2.2.3 Energy source:

Source type	:	G Guns
Air pressure	:	2000 psi
Volume	:	2860 cubic inch
No of subarrays	:	4
Source depth	:	5m.
Source width	:	27m
Source length	:	15m
Peak-peak	:	84.2 bar-m
P/b ratio	:	18.7 : 1

2.2.4 Gravity and magnetomer

Gravity and Magnetic data is not required on this survey.

2.3 GEODETIC PARAMETERS.

2.3.1 Survey datum.

Datum	:	GDA 94
Ellipsoid	:	GRS80
Semi Major Axis (a)	:	6378137.0
Inverse Flattening (1/f)	:	298.257222
Projection System	:	Universal Transverse Mercator (UTM)
Projection Zone	:	55 South
Central Meridian	:	147º East
Scale Factor at CM	:	0.9996

Latitude at Origin	:	0º (Equator)
False Easting	:	500,000
False Northing	:	10,000,000
Grid Units	:	Meters

2.3.2 World Geodetic System 84 (WGS-84)

Ellipsoid	:	WGS84
Semi Major Axis (a)	:	6378137.0m
Inverse Flattening (1/f)	:	298.257224

2.4 LINE NAME CONVENTION

The line naming convention was as follows:
ORS01-NNR
Where ORS01 is the Prefix, and
NN is the line number. R is the re-shoot code. R=A for the first re-shoot, R=B for the second re-shoot, etc.

Shotpoint numbering was to be ascending when shooting from west to east or south to north.
Shot point numbering was to be decrementing when shooting from east to west or north to south.

2.5 POSITIONING SYSTEMS

Primary Vessel Positioning

System: STARFIX-Spot DGPS with Starfix reference stations.
Optus satellite delivering RTCM Type 1 and 3 differential corrections.
Recommended set-up “weighted mean”.

Equipment: Trimble 4000 DS GPS Receiver
Trimble antenna
Starfix 6500 MK II demodulator
Allison Spot antenna
Pentium computer running MRDGPS software

STARFIX-Spot
Starfix Spot was used as the vessels Primary position, d/t diff stations available on Spotbeam being closer than ref stns available on MN8. The correction stations used for Spotbeam were;

Station Name	Station ID	Distance
Melbourne	385	158kms
Bathurst	336	795kms
Port Augusta	326	1071kms
Brisbane	275	1536kms

Secondary Vessel Positioning

System: Fugro STARFIX MN8 Differential GPS via InMarSat (P.O.R.).

Equipment: Trimble 4000 DS GPS Receiver
Trimble antenna
Starfix 6500 MK II demodulator
Pentium computer running MRDGPS software

2.6 IN SEA POSITIONING SYSTEMS:

Tailbuoy
A Tail-Buoy (TB) was deployed at the tail of the streamer for positioning.
The TB was fitted with Geo-Track - relative GPS, and radar reflector.

Relevant work book :WB.NAV.002 Tail Buoy Nav. Work Book

Relevant work instruction :WI.NAV.109 Work Instruction for
STARFIX/GEOTRACK Operators

Source Positioning N/A

Magnetic Compasses and birds
The compasses and birds will be mounted at 300m intervals on the streamer.
A total of 16 depth controllers/compasses will be mounted on the streamer.
The depth controllers / compasses will be Digicourse model 5010 / 5011.
Extra compass birds will be mounted in the front and tail of the streamer for redundancy.

Magnetic Declination

The value at the centre of the survey, 39 50 S, 145 30 E is calculated at 12.55 deg.
This is the average value of the IGRF 2000 and WMM 2000 models.

2.7 NAVIGATION PROCESSING.

This is to be performed onboard, using the latest version of QCPro software from ECL.

FINAL data format	:	UKOOA P190
Final data medium	:	SEGY
Relevant Procedure	:	TP.304

3 FIELD WORK SUMMARY

3.1 MOBILISATION

Geo Arctic sailed from Burnie, Tasmania on the 31st May to first complete some lines on a spec. project in the Sorrell basin to the SW of King Island. Client's Representative Rodney Waldon had joined the vessel on the 30th to wait onboard until we were ready to suspend the Sorrel basin work and transfer to the Origin Energy Resources project.
At 00:00 on the 4th June Geo Arctic completed picking up our cable to the SW of King Island and started steaming east towards Bass Straight. At 07:00 the 4.6km cable deployment was begun 30km to the SW of the prospect and by 12:29 all equipment had been launched into the sea ready for testing.
The first line ORS01-03 was started at 14:02 4th June completing the mobilisation phase of the project.

3.2 ACCEPTANCE TEST

With the 4.6km cable fully deployed after 12:00 on the 4th June a full set of instrument tests were run on the MSX recording system. All channels were found to be in specification except for one channel, but this was considered acceptable within the terms of the contract specification.
Note the contract called for a 4.5km cable with 350 12.5m long groups. The MSX must have an even number of active sections therefore a 4.6km cable was configured with 368 12.5m groups. It was accepted that this configuration exceeded the minimum requirements and that there would be no extra charge for the increased number of channels.

The 26 G -gun source was proved to be fully functional with all guns firing as per the 2860 cu .in. array specification with 7 spare guns in the sea.

3.3 CALIBRATION

Instruments test : A full set of I/O MSX instrument tests were performed on site June 4th 2001 with the equipment ready to start production. All parameters were found to be within specification. Results were displayed on paper on paper printout and stored to tape cartridge.

Gyro calibration : Underwater Surveys Ltd. Pty performed calibration check on the Plath survey gyro on the 15th December while the vessel was in Cape Town dry dock.

GPS verification : . On the 31st December Underwater Surveys Ltd. Pty. performed an independent survey of the position of the GPS navigation antennas and tailbuoy tracking system.
A report showing that all equipment was within specification was received on the 27th December.

Draught measurement : An echosounder bar check was completed when the vessel left the Cape Town dry dock on the 19th December .

Sound velocity : Nominal 1500 m/s was used.

3.4 SURVEY SUMMARY AND PERFORMANCE

Survey summary
The project started on the 4th of June 2001 with the vessel's arrival onsite in the Bass Straight. The 4.6km cable was deployed into a calm sea and tested followed by the guns. As no problems were encountered the operation was ready to approach the first line and start production on line ORS01-03 at 14:02 hours.
Although Gravity and Magnetometer recording were not part of the specification it was agreed to record this data in case the Client decided that they may want to purchase it at a later date.

As the first short 20km line went well and the seas remained calm the next line shot was ORS01-13, the priority 'well tie' line. As required in the specification when shooting east to west of north to south, the shot points decrement. To ensure that the vessel fired a shot exactly on the well location it was entered as a way point. Unfortunately this caused a hang up with the navigation program and it was necessary to abort the line at sp2033 right on the well location. A circle was made with a 7km run-in and a half cable overlap. The second part of the line ORS01-13A was successfully shot to complete full coverage of the priority line by 02:41 on the 5th June.

With continuing good weather Geo Arctic proceeded to run from line to line through the program with the cable towed at 7.5m depth in calm seas. Excellent data quality was recorded through 5th to the beginning of the 8th June with 352km acquired in 17 lines. At the beginning of the 8th June however the winds and swell increased and although line –15 was shot in its entirety it had to be later rejected due to excess swell noise.

After 14 hours of weather down time on 8th June, Geo Arctic made another attempt at line –15A with the cable down at 10m. This was acquired with acceptable noise level at the beginning, which reduced further during the line. As the seas calmed down we were able to return the cable to 7.5m depth before the start of the next line ORS01-06A.

The last line of the project ORS01-14 was completed in calm seas on the 9th June. As Geo Arctic was not planning to return to port the Client's representative Rod Waldon left the vessel by pre-arranged helicopter less than one hour after the last line was acquired. He hand carried all the data except for the last line recorded which was left on board until a copy could be made.

Geo Arctic recovered all the guns but encountered winds up to 35 knots when recovering the cable. The vessel then steamed north west to Victorian waters to resume the previous spec project.

3.5 DATA QUALITY

Surface navigation and position Position accuracy was maintained throughout the survey and checked by comparisons between the Primary Starfix Spot DGPS and the Secondary Stafix MN8 system. There was on navigation program failure on the vessel first attempt so shot the longer tie line ORS01-13 which had the well location programmed in as a way point. The program hung up at this point and the vessel had to circle to resume the line. See navigation report for details.

Seismic system
The noise specification was quite tight and the cable towed at 7.5m, fortunately most of the survey was acquired in excellent weather conditions and the noise specification was easily meet.
On the 7th June two line –15 were rejected when the weather increased quickly. After the weather front passed through on the 8th June it was reacquired with a 10m cable depth and acceptable noise levels. On the last two lines the cable was returned to a 7.5m depth and successfully shot in quiet conditions. The currents did not cause any feather angle problems.
Otherwise there were no technical problems with the guns or recording system and excellent data quality was obtained throughout the project within the expected time frame.

3.6 POSITION PROCESSING

Position processing was performed onboard using QCPro software. On-line P294 data was imported from StarfixSeis and processed into a P190 output tape ready for delivery to the customer. There were no real problems, see the Position Processing Report for details.

3.7 SEISMIC PROCESSING

The MSX recorded field tapes were read into the Focus/DISCO Unix processing system for the purpose of QC checking. Noise analysis was carried out, a near trace profile produced. Velocities were picked every 1km along each line and a stacked section produced for display to the client representative. Checks for gun performance were made by examining the near field signatures recorded on the aux. channels as well as exact offset checks.
Excellent results were produced throughout the survey without any technical problems. See the QC processing report for details.

3.8 WEATHER

Generally the weather during the survey was excellent. The exception was on the period from 18:00 7th through to 12:00 8th June when the winds and swell quickly increased. Also on the 9th June during cable recovery after acquisition had been completed the winds and swell quickly increased.

3.9 TIDES AND CURRENTS

There were only slight noticeable effects from tides and currents and they did not interfere with survey operations.

3.10 OBSTRUCTIONS AND SHALLOWS

Nil

3.11 SEISMIC ACTIVITY

Nil

3.12 FISHING AND SHIPPING ACTIVITIES

Fisheries - A consultant to the fisheries industry, Andrew Levings & Associates, was employed to liase between Fugro Geoteam and the various fishing associations but no fishing activity were seen during this project.

Shipping - There were regular sightings and radio contact with five ferries who crossed the Bass Straights. A faxed warning had been sent to them as well as a general coast guard broadcast advising all shipping of the survey activity. All co-operated fully and there were no difficulties from passing shipping.

3.13 ENVIRONMENTAL ISSUES AND DIVING ACTIVITY

There were no environmental incidents during the project.
A documented whale watch was maintained from the bridge as required by the conditions of the permit. There were however no sightings. Copies of the logs are included in the appendix of this report and the originals sent to the “Marine Species Section” of the Australian Environment Dept., Canberra.

3.14 THIRD PARTY INTERFERENCE

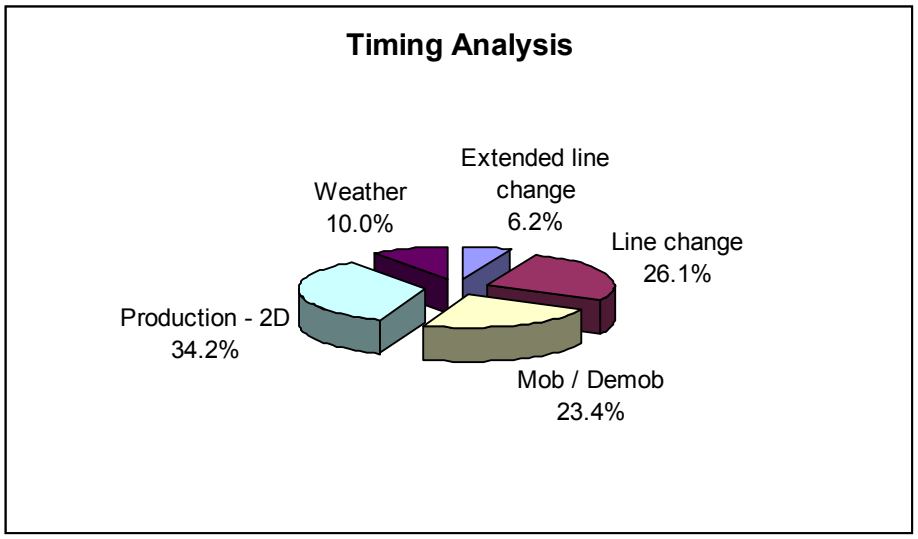
Nil

3.15 DEMOBILISATION

Client's representative Rod Waldon left by helicopter within an hour of the last line being acquired on the afternoon of the 9th June. He carried with him a copy of all the data with the exception of the last line ORS01-14, which was still being copied. Having recovered the cable before midnight of the 9th the vessel steamed north west back to continue work on its previous project to the north west of King Island.
All remaining data was shipped when the vessel eventually reached Port Kembla N.S.W. on the 22nd June.

3.16 SURVEY STATISTICS

Survey performance



Chargeable :-

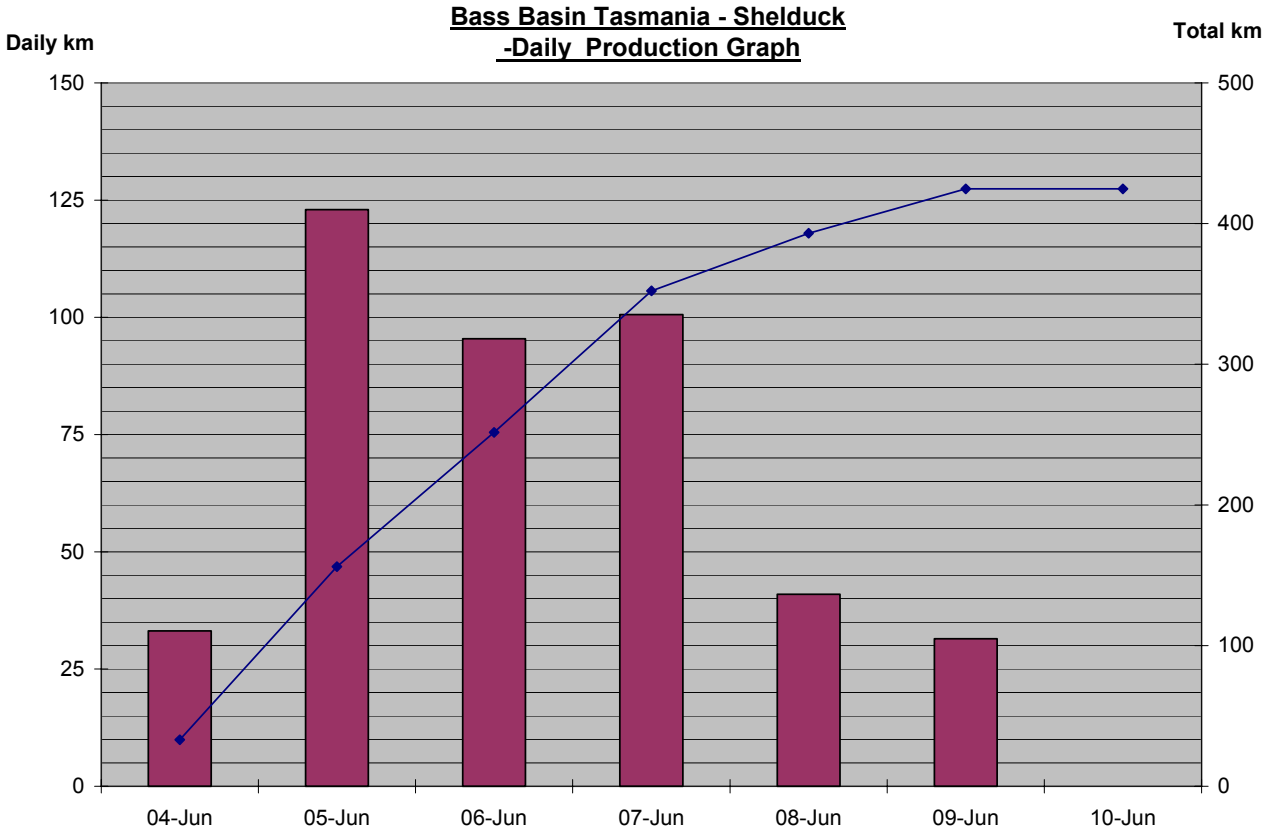
	Accumulated Hours	
Extended line change	8.72	6.05%
Line change	36.53	25.37%
Mob / Demob	32.78	22.77%
Production - 2D	47.78	33.18%
Weather	13.98	9.71%
	139.80	**97.08%**

Non Chargeable :-

	Accumulated Hours	
Navigation	4.20	2.92%
	4.20	**2.92%**

Total time = **144.00** hours or **6.00** days

Production :- 20 lines shot in 23 sequences totalling **424.556** kilometres full sail distance.


Bass Basin Tasmania - Shelduck
-Daily Production Graph
Daily km
Total km
150
125
100
75
50
25
0
500
400
300
200
100
0
04-Jun
05-Jun
06-Jun
07-Jun
08-Jun
09-Jun
10-Jun

4 HEALTH, SAFETY AND ENVIRONMENTAL

The contractual commitments and instructions regarding HSE for this project is found in Contract 1100000159 Section IV Appendix I, Health, Safety and Environmental standards. The following documentation is referred to and forms a part of the requirements / specifications :

- E&P Forum 1993, Health Management Guidelines for Remote Land-Based Geophysical Operations. Report No. 6.30/190
- E&P Forum 1994, Health, Safety and Environmental Schedules for Marine Geophysical Operations. Report No. 6.34/206
- E&P Forum 1995, Health, Safety and Environmental Schedules for Land Geophysical Operations. Report No. 6.35/207
- E&P Forum 1994, Health, Safety and Environmental Schedules for Marine Geophysical Operations. Report No. 6.34/206

and Shell Health, Safety and Environmental Committee documents :

- SHSEC, 1991, Management Guidelines for hearling conservation
- SHSEC, 1992, Guide for Safety Performance Reporting
- SHSEC, 1993, Guide for Health Performance Monitoring
- SHSEC, 1993, Incident Investigation and Analysis Guide
- SHSEC, 1994, Medical Emergency Guidelines for Management and
- IAGC, 1991b, Marine geophysical Operations Safety Manual.

4.1 SAFETY OVERVIEW

Toolbox meeting

Minutes of Safety Meeting

08th June 2001 **R/V Geo Arctic**

Attendance :-
K.Pidzhakov & M.Julier – Master, N.Isaev & D.Dillon – Chf Off. R. Pankratov & C.Gonsalves – Chf. Eng.
S.Platt - Boatswain. V.Olkovskiy Superintendant. - S.Shamarin Ch.Ele. – V.Belous Nav. R.Waldon – Client rep. J.Carrey – Party Chief, K.Ytterland – Mech Superv.

Meeting opened at 16:00

A: Review of the previous meeting held on the 25th May 2001
Points from the previous meeting were read and briefly discussed.

B: Review of incident reports since last safety meeting.
3 reports since last meeting.

1. ARC 18/01 Coming alongside pier 7 in Burnie, a wooden fender caught a porthole and the glass and surrounding frame were broken.
2. ARC 19/01 Crewmember involved in accidental collision with another person while visiting ashore in Burnie.
3. ARC 20/01 Streamer lost due to broken leadin.
4. ARC 21/01 Crewmember suffered from infected gum.

C: Review of last drills.

31st May 2001 All new crewmembers were given a safety induction tour.
3rd June 2001 Abandon Ship Drill.

D: Review of the outstanding items in the action point registry.
The outstanding points from the Safety Action Point Register were read. The following is an update on the situation regarding these action points :-

71/00 Warnings were missing at some power tool stations. Ref. audit point 17.34.
The feedback from the office dated 09.04.01 has now been filed in the correspondence from the office section of the safety file.
Signs received. Some in place.

Safety delegate / P.C.

83/00: Office to produce list of required Helideck equipment according to CAA regulations (BP/Am audit).

Closed.

02/01 The test control of smoke hoods.

Some 20 smoke hoods have been weighted and re-sealed. A list of the smoke hoods tested has been entered into the register. The remaining 20+ smoke hoods that are due to expire in June / July MUST be done at port call scheduled @ 20th June 2001.
New plastic covers are now on order to replace the cracked ones. Scheduled to arrive 20th June 2001.
These will be fitted during the test control weighting + some of the already weighed hoods need new covers.

08/01 Handrails should be installed where possible in the galley area, to reduce the risk of slips and falls in rough weather.
Ref. incidents ARC 012-01 and ARC 017-01.

P.C. / .Ch.steward. / Ch.Mate

09.01 Electrical extension cables used on deck in poor condition.

Closed

E: Safety Feedback from office :
None.

F: New Business :

The following points were raised and discussed at the meeting.

10-01 New action point - Headset for helicopter communication missing.
Australian Captain Mike Julier advised that this is a requirement not an optional extra.
PC to look into specification requirements.

It had been noticed twice that gun crew was recovering guns without required safety gear.

Some crewmembers felt uncertain as to where to assemble in a MOB situation.

The meeting closed 16:30

Safety audit

On the 20th April 2001 Woodside Offshore Petroleum performed an “Offshore Helideck Inspection” while the vessel was in Hobart. The helideck was pronounced ready for use.

4.2 ACCIDENTS AND NEAR MISS

Accidents Nil

Near miss Nil

4.3 ENVIRONMENTAL

No environmental incidents occurred and there was no chemical garbage spillage in to the sea during the project.

All regulation requirements regarding soft starts of the guns were adhered to.

5 PERSONNEL

5.1 GENERAL

The vessel left Burnie, Tasmania on Wednesday 27th after a partial crew change. To comply with Australian legislation a partial Australian marine crew was employed onboard. Also to comply with the Russian maritime register of shipping a minimum number of Russians were also employed in key positions on the marine crew.
The Canadian gravity engineer was still onboard from the previous project, see note about his activities in the Gravity Report section.
The Russian Superintendent was onboard preparing for an official inspection at the next port call and not part of the project.

5.2 CREW LIST

No.	Name		Rank
1	Pidzhakov	Konstantin	Master
2	Julier	Mike	Master
3	Isaev	Nikolay A.	Chief Mate
4	Dillon	Dion Joseph	Chief Mate
5	Tsygankov	Nikolay A.	Second Mate
6	Ashmore	Bob	Second Mate
7	Namanyuk	Sergey M.	3rd Officer
8	Iljashevich	Fedor M.	Radio Officer
9	Matsepula	Vladimir	Boatswain
10	Platt	Steve	Boatswain
11	Zelinskiy	Vladimir	A.B.
12	Grishenkov	Vladimir N.	A.B.
13	Moss	Colin	A.B.
14	Cloonet	Michael	A.B.
15	Gough	Michael	A.B.
16	Pankratov	Robert I.	Chief Engineer
17	Gonsalves	Claude	Chief Engineer
18	Karakosov	Evgeny	2nd Engineer
19	Sloane	Patrick	2nd Engineer
20	Vasyutin	Oleg M.	3rd Engineer
21	Joseph	Philip	3rd Engineer
22	Kurochkin	Alexsey	Motorman
23	Karachev	Sergey	Motorman
24	Shamarin	Victor A.	1st Elec. Eng.
25	Jeffries	Kevin	1st Cook
26	Baczik	Michael	2nd Cook
27	Romaniv	Galina Y.	Stewardess
28	Ushmaeva	Antonina	Stewardess
29	Ross	Jeffrey	Steward

No.	Name		Rank
30	Polev	Nikolay F.	Chief Observer
31	Medvedev	Viktor S.	Chief Observer
32	Zhuravlev	Vladimir Y.	Observer
33	Zhuravlev	Viktor N.	Observer
34	Svetlichniy	Alexey P.	Chief Navigator
35	Belous	Valeriy	Navigator
36	Teterkin	Alexandr N.	Chief Gun Mech.
37	Nikulin	Ilija B.	Chief Gun Mech.
38	Mogilevskiy	Genadiy	Gun Mech.
39	Egorov	Vasily V.	Gun Mech.
40	Polozov	Nikolay I	Chief Compressor Man
41	Gusev	Anatoliy V.	Compressor Man
42	Olkhovskiy	Vladimir	Superintendant
43	Carrey	John	Party Chief
44	Jones	Tony	Instrument Supervisor
45	Taylor	Kevin	Navigation Supervisor
46	Ytterland	Kare	Mechanical Supervisor
47	Brookes	Kathryn	Seismic Processor
48	Salter	Shawn	Gravity Eng.
49	Barber	Mike	Chief Steward
50	Waldon	Rodney	Client Representative

Total number of persons on board 50

6 DEPARTMENT REPORTS

6.1 POSITION REPORT

6.1.1 Introduction

The vessel mobilised for the survey at sea on the 04/06/01. The “Geo Arctic” was already working in the Bass Strait area prior to the commencement of the Survey. On the 04/06/01 the vessel started reconfiguring for the Shelduck Seismic Survey and headed towards the survey area.
Differential corrections in the survey area were available through P.O.R satellite which was tuned to through the Inmarsat system, and Optus satellite which was tuned to through the Spotbeam system.

Scope of Work	:	2D Seismic Survey
Client	:	Origin Energy Resources Ltd
Project Number	:	34834
Project Name	:	Shelduck Seismic Survey
Location	:	Bass Basin Tasmania, Permit T/18P

6.1.2 Navigation Systems

Navigation System	:	StarfixSeis suite 3.1 (Fugro Survey Pty Ltd)
Primary Navigation	:	Fugro Starfix Spot Differential GPS.
Demodulator	:	Starfix M2 Demodulator
GPS Receiver	:	Trimble 4000DS 9 channel, nav version 7.29
Secondary Navigation	:	Fugro Starfix MN8 Differential GPS
Demodulator	:	Starfix M2 Demodulator
GPS Receiver	:	Trimble 510 Survey receiver 9 channel, nav version 7.29
Tailbuoy and Source Positioning	:	Fugro Geotrack Tailbuoy Tracking System
Acoustics	:	
Binning	:	
Navigation processing	:	QCPro
Seismic Recording	:	Input/Output, 24 bit system
Bird Controller	:	Digicourse 5010/5011
Gun Controller	:	Hydrapulse 200X
Echosounder	:	Simrad EA 500 12 & 27 kHz
Speed log	:	
CTD Probe	:	
Gyro (main)	:	C.Plath, Navigat 2. DHI. Interfacedvia Lekmkuhl Digital Gyro repeater with RS232 output to StarfixSeis
Gyro (secondary)	:	SG Brown 1000B

6.1.3 Survey Information

Prior to the start of the Survey there was some confusion as to which datum Origin Resources wished the job to be shot in. Initial information suggested that Origin wanted the survey to be shot in WGS84 and later transformed to GDA94. It was pointed out to Origin through liasing with the onboard client rep that there was no point shift between the two datums just a small difference in inverse flattening and that it was normal procedure for the required datum shift to be carried out by the online system. Origin Resources agreed to this and the survey was shot in GDA94.

Survey Datum and Datum shift parameters

GPS Datum	:	WGS 84
Ellipsoid	:	WGS 84
Semi-major Axis	:	6378137
Inverse flattening	:	298.257224
Survey Datum	:	GDA 94
Ellipsoid	:	GRS80
Semi-major Axis	:	6378137.00
Inverse flattening:	:	298.257222
Shift Parameters	:	
X-shift	:	0.0
Y-shift	:	0.0
Z-shift	:	0.0
X-rotation *	:	0.0
Y-rotation *	:	0.0
Z-rotation *	:	0.0
Scale correction	:	0.0

(*Bursa Wolf sign convention)

Projection parameters

Projection	:	Universal Transverse Mercator (UTM)
UTM Zone	:	55 South
Central meridian	:	147°
Latitude of origin	:	0° (Equator)
False Easting	:	500000
False Northing	:	10000000
Scale Factor	:	0.9996

6.1.4 Survey Parameters

Definition

Acquisition mode	:	Single vessel
Configuration	:	Single streamer single source
Shot interval	:	18.75m

Source

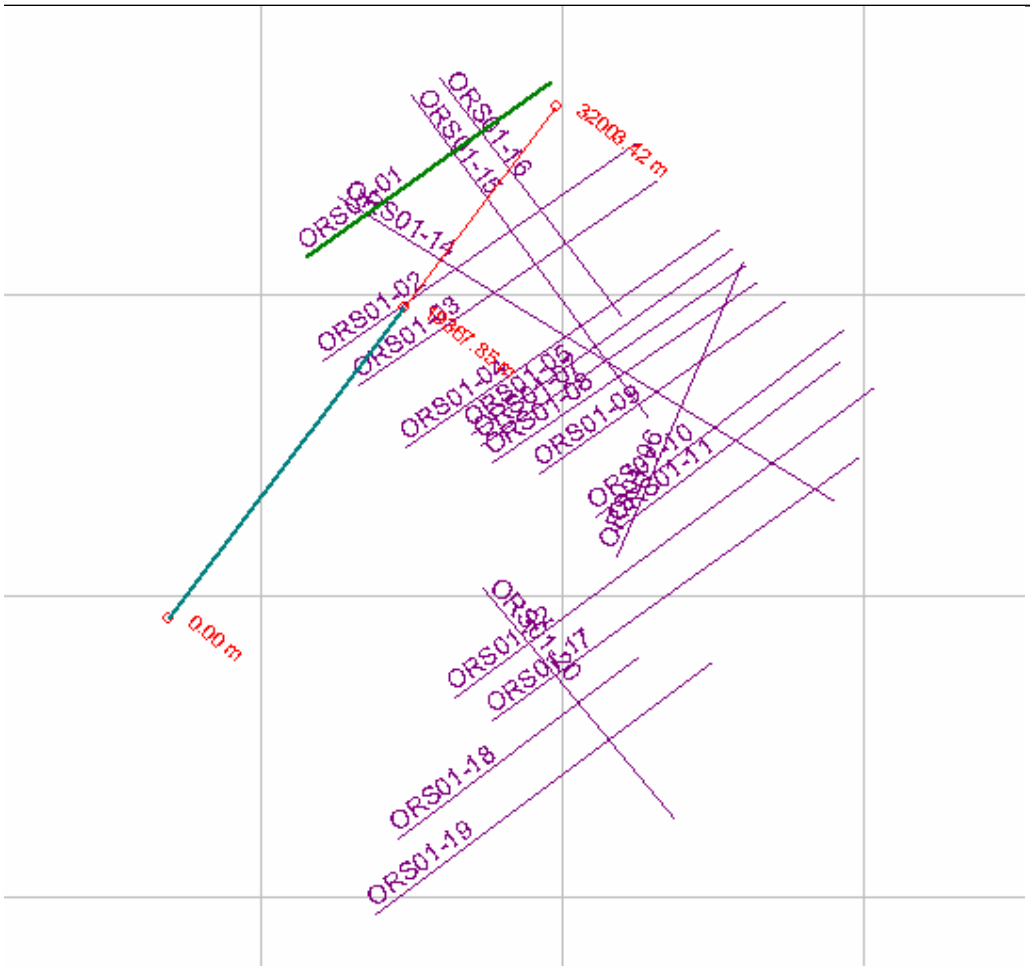
Source type	:	G-guns
Air pressure	:	2000psi
No. of sub-arrays	:	4
Source depth	:	5m
Source width	:	27m
Source length	:	27m
Source layout	:	

Streamers

Streamer type	:	I/O MSX 24 bit digital
No. of streamers	:	1
Streamer active length	:	4500m
Streamer separation	:	
Streamer depth	:	7.5m +/- 1.5m
Near offset (inline)	:	150m
No. of groups	:	360
Group interval / length	:	12.5m/17.55m
No. of depth controllers	:	17
Number of compasses	:	9
Magnetic variation	:	12.55° (Average value of IGRF2000 & WMM2000 models at centre of prospect)

6.1.5 Survey Area

The survey area was approx. 120km east of King Island in Permit area T/18P in the Bass Basin Tasmania. The survey consisted of 19 runlines and 1 centreline. The centreline was defined to run through well location Aroo-1.



6.1.6 Naming convention

The line naming convention followed was ORS01-NNR
Where ORS01 is the Prefix, and
NNN is the line number. R is the reshoot code. R=A for the first reshoot, R=B for the second reshoot, etc. Shotpoint numbering was continuous across reshoots.
Shotpoints were to increment from West – East and North - South
Shotpoints were to Decrement from East-West and South-North
FSP on incrementing lines=1000
LSP on decrementing lines 1000 - runout

Preplots

	SOL	EOL	
ORSO1-01	39 45 59.8S	39 41 22.7S	
	145 23 29.8E	145 32 08.4E	
ORSO1-02	39 48 47.9S	39 43 03.6S	
	145 24 04.2E	145 35 06.5E	
ORSO1-03	39 49 28.4S	39 44 05.5S	
	145 25 18.6E	145 35 49.3E	

Preplots

	SOL	EOL	
ORSO1-04	39 51 09.4S	39 45 24.8S	
	145 26 54.5E	145 37 56.9E	
ORSO1-05	39 50 50.4S	39 45 57.0S	
	145 29 10.0E	145 38 24.7E	
ORSO1-06	39 54 10.9S	39 46 16.2S	
	145 3411.7E	145 38 43.8E	
ORSO1-07	39 51 09.3S	39 46 22.5S	
	145 29 29.5E	145 38 51.1E	
ORSO1-08	39 51 37.0S	39 46 51.3S	
	145 29 53.0E	145 39 16.2E	
ORSO1-09	39 51 56.9S	39 4721.5S	
	145 31 32.2E	145 40 12.4E	
ORSO1-10	39 53 05.5S	39 48 08.7S	
	145 33 27.5E	145 42 14.1E	
ORSO1-11	39 53 28.8S	39 49 02.1S	
	145 34 10.4E	145 42 07.9E	
ORSO1-12	39 57 54.0S	39 49 45.0S	
	145 28 26.4E	145 4318.7E	
ORSO1-13	39 55 38.4S	39 47 25.426S	39 42 03.8S
	145 18 28.0E	145 26 52.748E	145 32 21.5E
ORSO1-14	39 44 23.0S	39 52 47.4S	
	145 24 41.2E	145 41 51.0E	
ORSO1-15	39 41 41.3S	39 50 31.1S	
	145 27 18.0E	145 35 23.5E	
ORSO1-16	39 41 15.0S	39 47 46.6S	
	145 28 15.4E	145 34 30.0E	
ORSO1-17	39 58 33.3S	39 51 37.0S	
	145 29 46.5E	145 42 45.0E	
ORSO1-18	40 01 41.5S	39 56 54.2S	
	145 26 22.4E	145 34 53.7E	
ORSO1-19	40 03 41.4S	39 57 02.7S	
	145 25 32.2E	145 37 29.0E	
ORSO1-20	39 54 58.6S	40 01 18.5S	
	145 29 29.3E	145 36 03.0E	

Vessel

The vessel datum x=0,y=0,z=0, is defined as the ships main mast projected down to sea level.All vessel offsets such as primary and secondary GPS antennas are offset from this point

Source

Vessel operated in single source mode with the nominal offset from stern to centre of source being 49.85m.

Streamer
Single streamer with nominal head of streamer defined as 187.35m from stern, first trace 199.85m from stern.

Tailbuoy
One active seatex active tailbouy deployed on the end of the streamer

Digicourse Birds
17 Digicourse birdsmounted on the streamer, 9 of which are compass birds

Gun Arrays
Four subarrays 2 each side.

6.1.7 Calibration / Validations

Underwater Surveys (Pty) Lld, performed a Gyro calibration and position verification of the R/V Geo Arctic navigation equipment, in Cape town, South Africa, 18th and 31st December 2000. Full details of the results are contained in Underwater Surveys (Pty) Ltd, Report No. PSA202Gyro December 2000, which is summarised in **Table 1** and **Table 2** below :

Table1

Gyro Calibrations		
	Survey Gyro 1 C. Plath (°)	**Ship's Gyro 2 SG Brown (°)**
True azimuth	131.68°	131.68°
Gyro reading	132.50°	132.50°
C-O	**-0.82**°	**-0.82**°

Table2

GPS and RGPS Systems verification		
DGPS	**Latitude**	**Longitude**
Calculated position	33° 54' 57.212 S	18° 27' 15.837 E
Observed position	33° 54' 57.262 S	18° 27' 15.933 E
C-O	-0.05"	-0.096"
GeoTrack	**Northing**	**Easting**
Difference	-0.41 m	-1.70 m

Sound Velocity
Using Default value of 1500 m/s

6.1.8 Position equipment performance

MRDGPS

STARFIX-Spot

Starfix Spot was used as the vessels Primary position, d/t diff stations available on Spotbeam being closer than ref stns available on MN8. The correction stations used for Spotbeam were;

Station Name	Station ID	Distance
Melbourne	385	158kms
Bathurst	336	795kms
Port Augusta	326	1071kms
Brisbane	275	1536kms

Spotbeam performed well throughout the survey.

STARFIX MN8
The coverage available on the P.O.R satellite was not particularly good for this area. Ref station Melbourne was the only station within normal range for a diff station. Reference stations used were;

Station Name	Station ID	Distance
Melbourne	385	158kms
Dunedin	026	2136kms
Aukland	022	2561kms

The MN8 system was in close agreement with Spotbeam solution and proved to be useful secondary system.

Tailbuoy tracking
Performed very well throughout the survey.
Tailbuoy stopped working for a 200 sp period on line ORS01-12. The reason for the dropout is unknown but the tailbuoy has worked well since.

Starfix suit software
The vessel was using Starfix Suite software version 3.1. A problem occurred on seq002 line ORS01-13. It was a client requirement that the line be shot as a centreline since there was a wellhead on the line that the client was interested in. It was also a requirement that the line be shot with decrementing shotpoints in the direction that we acquired the line in. The StarfixSeis software hungup at the sp after the dogleg. Shotpoint spacing was not being computed correctly, the boat had to circle on the line. Fugro software support was notified of the Software problem and data files were sent to them. At the time of writing they are still looking into the problem.

Echosounder
Water depths in the Survey area were fairly constant between around 70 – 80m. Three echosounder transducers were logged online and written to the P294 file. The transducers used were Simrad EA500 12 and 27 kHz and the Atlas Deso 210 kHz. All transducers performed well throughout the survey.

Streamer compass
All compasses performed well throughout the survey

Acoustics N/A

C-Plath, S.G Brown 1000B
Performed well throughout the survey.

6.1.9 Downtime

Positioning systems:
Nav Software: 4.2hrs
Operator:

6.2 INSTRUMENT REPORT

6.2.1 Introduction

The cable was configured to 4600m and all onboard systems were tested.
Production commenced on the 04th of April for a period six days up to the 11th June.

Scope of work	:	2D Seismic survey
Client	:	Origin Energy Resources Ltd.
Project number	:	34834
Location	:	Bass Basin Tasmania – Permit: T/18P

6.2.2 Instrument system

Main systems

Recording system	:	Input/Output MSX. SW ver 2.0111
Streamer system	:	Input/Output MSX.
Bird controller	:	Input/Output DigiScan. SW ver 3.12
Gun controller	:	Hydro Pulse 200X Ver. 1.a.1 For Windows
Number of streamers	:	1
Length of streamers	:	4600m
Streamer depth	:	7.5m (+/-1.5m)
Shot point interval	:	18.75 m
Near Offset	:	148 m

Recording system

No. of modules	:	23 per streamer
Waterbreak channels	:	4 per streamer
Auxiliary channels	:	16
Cable sensitivity	:	14.0 V/Bar
Total No. of channels	:	368
High cut filter	:	206 Hz, 264 dB/octave
Low cut filter	:	4 Hz, 12dB/Octave
Pre-amp gain	:	6 dB
Group length	:	17.5
Recording Length	:	5 seconds
Sample rate	:	2ms
Trace Summing	:	No
DC offset removal	:	Yes
Depth transducers	:	Not Recorded
Online display	:	OYO GS 624-2
Tape deck	:	IBM Magstar 3590 Microcode ver.ECD19129DOI8_1EC
Tape format	:	SEG D
Data Blanking at SOR	:	No
Data recording format	:	8058-IEEE
Max files per tape	:	1500
Navigation interface	:	Header Serial link to StarfixSeis
User Header size	:	6016
User header version	:	8
Extended Header ver	:	3

Number of 5010 birds : 2
Number of 5011 birds : 15

6.2.3 Calibration and checks

A monthly test was performed on the recording system before the start of the project and each time the cables were recovered/deployed where possible. On all occasions the equipment was proved to perform within the contract specifications. Any deviations in the performance was noted in the observer logs. Tests were carried out periodically, when down time or long line changes permitted, to confirm that the equipment was still within specification. The Monthly tests were carried out in accordance with the manufacturers recommended performance verification tests and included the following 24 tests .
MSX Performance Specifications for these tests are given here below:

File No.	Test Mode	Error limit	Data type	Apply low cut filter	DC Offset Removal	Test type	Result
1	T13	0.00%	Special Bit Pat.	No	No	Pattern, All ones	
2	T13	0.00%	Special Bit Pat.	No	No	Pattern, 50% ones	
3	T13	0.00%	Special Bit Pat.	No	No	Pattern, All zeros	
4	T13	<0.0001%	15.625Hz, 0 dB	No	No	Pattern	
5	T2	<0.0005%	15.625Hz, 0 dB	Yes	Yes	Dynamic Range	
6	T2	<0.0020%	15.625Hz, -10 dB	Yes	Yes	Dynamic Range	
7	T2	<0.0050%	15.625Hz, -20 dB	Yes	Yes	Dynamic Range	
8	T2	<0.0160%	15.625Hz, -30 dB	Yes	Yes	Dynamic Range	
9	T2	<0.0500%	15.625Hz, -40 dB	Yes	Yes	Dynamic Range	
10	T2	<0.1600%	15.625Hz, -50 dB	Yes	Yes	Dynamic Range	
11	T2	<0.5000%	15.625Hz, -60 dB	Yes	Yes	Dynamic Range	
12	T2	<1.6000%	15.625Hz, -70 dB	Yes	Yes	Dynamic Range	
13	T2	<5.0000%	15.625Hz, -80 dB	Yes	Yes	Dynamic Range	
14	T2	<20.000%	15.625Hz, -90 dB	Yes	Yes	Dynamic Range	
15	T2	<20.000%	15.625Hz, -100 dB	Yes	Yes	Dynamic Range	
16	T5	< 2.9uV	Special Bit Pat.	Yes	Yes	Cable Noise,50% ones	
17	T10	> 70 dB	15.625Hz, 0 dB	Yes	Yes	Cable Noise	
18	T11	> 60 dB	15.625Hz, 0 dB	Yes	Yes	Cable Noise*	
19	T12	> 60 dB	15.625Hz, 0 dB	Yes	Yes	Cable Noise*	
20	T6	7% ch-ch	Imp. 64 bit, 0.5ms	Yes	Yes	Impulse	
21	T7	7% ch-ch	Imp. 64 bit, 0.5ms	Yes	Yes	Impulse*	
22	T7	7% ch-ch	Imp. 64 bit, 0.5ms	4 Hz	Yes	Impulse*	
23	T0		Special bit Pat.	Yes	Yes	Cable noise*	
24	T4	>1560mV	Analog loopback	No	No	Cable noise, 2.048 V*	

Test mode description

T0	Normal Acquisition	T7	Analog Impulse, phones connected
T2	Analog loopback, phones simulated	T10	CMR (Common Mode Rejection)
T4	Analog loopback, phones connected	T11	Cable crossfeed, Odd pairs driven
T5	Preamp terminated	T12	Cable crossfeed, Even pairs driven
T6	Analog Impulse, phones simulated	T13	Digital loopback

*** indicates that the test result is dependant on Ambient Noise**

Daily tests were performed on appropriate line changes with good weather, or when down time allowed and consisted of a selection of tests from the standard monthly test suite as below;

- Pattern test
- System Dynamic Range test
- Equivalent input noise test
- Impulse test
- Harmonic distortion test
- Amplifier noise and DC offset

Equipment tests, calibration and set-up took place during mobilisation. These included:

MSX 24bit recording system	Acceptance test , parameter set-up
Streamer	Polarity check, offset and balance.
Digibirds	Battery check, function test .
Gun	Depth transducers checked Source separation
Inventory	Inventory checked for necessary levels of stationary, cartridges and consumables

6.2.4 Instrument equipment performance

Recording
The MSX recording system performed very well during this survey accumulating no downtime.
A Semi-monthly Instrument test was performed Prior to the first Production Line proved the system to be operating well with-in manufacturers specifications. Daily Tests were performed when the consistent production pattern allowed.

Streamer
The streamer balance proved to be a good throughout the project.

Gun controller
The Hydrapulse 200X gun controller performed well throughout the survey.
Incurring no downtime.

6.2.5 Downtime

Overall the prospect went extremely well from the instrument department point of view.
Down time is as follows:

See Party Chiefs report for fuller statistical analysis.

6.3 SOURCE REPORT

6.3.1 Introduction

The main energy source was a single source, the array used was a Sodera G gun type with a working volume of 2860 cu. inch, with a working pressure of 2000 psi.

6.3.2 Source system

The gun array configuration consists of four sub arrays with a combination of nine or eight guns per sub array.
The source consists of 26 active Sodera G-guns plus 7 guns used as spares on the arrays.
The sizes of the Sodera G-guns that are used on this vessel are: 40, 70, 100, 150,
and 250 cu. inch.
See diagram for array configuration.
The sub arrays are towed from fixed booms.
The gun depths are monitored in the instrument room.

Source type	Sodera G-gun
Array volume	2860 cu.in.
Air pressure	2000
Number of sub arrays	4
Source depth	5 metres, +/- 0.5 meter
Source length	15 metres
Source separation outer - outer	27 metres
Source separation inner-outer	9 metres
Back deck to centre source	49.85 metres
Shot interval	18.75metres
Source controller	Hydrapulse 200X Minipulse
Source synchronisation	+/- 1 ms

6.3.3 Calibration and checks

All guns solenoid and timing sensor were checked before deployment.
A Click test was performed to verifying the gun positions correspond to the gun controller.
All 12 depth sensors were calibrated prior the start up of the project.
Depth rope was checked for correct source depth of 5.0 metres.
All near field Hydrophones were tap tested before deployment.

6.3.4 Source equipment performance

The Sodera G-gun performance was maintained at a high standard with constant monitoring in the instrument room. All sub arrays were recovered as required for inspection and maintenance.
Relevant spare guns were enabled as required.
There are two gun mechanics per shift with one supervisor on call 24 hours per day.
The instrument room is constantly manned during production periods.
The performance of the Sodera G-guns during this project was very good, with only routine maintenance being under taken.
Gun controller performed well during the survey. Gun statistics were produced at the end of each line.
Near field signature were logged in the header together with gun synchronisation and depth data.
Air gun pressures were monitored in the gun shack and in the instrument room by the observers.
If spare guns were used, they were logged by the instrument room observers.

COMPRESSOR PERFORMANCE

The high-pressure air supply for the array source was produced by using the LMF high-pressure air compressor and 3 EK 30 compressors.
The air pressure is regulated by means of a Fisher control valve; the set pressure for this contract was 2000 psi. +/– 10.0 %.
During production periods the compressors temperatures and pressure are logged.
The LMF compressor and the EK 30 compressors in use performed well.

BACK DECK EQUIPMENT PERFORMANCE
The gun sub arrays are deployed and recovered using a combination of hydraulic winches, which are controlled by manual operating handles.
During deployment and recovery of the gun sub arrays three people are required.
The instrument room and the bridge are able to monitor and communicate with the gun deck by means of C.C.T.V and radio system.
The deck equipment performed well through out this project, and only routine maintenance was undertaken. Winches and hydraulic power pack performed well during the survey.

IN WATER EQUIPMENT PERFORMANCE
Generally all arrays towed very well during the survey. Source position was calculated using time measurements.

6.3.5 Downtime

No downtime was logged on this project.

6.4 SEISMIC PROCESSING REPORT

6.4.1 Introduction

This report concerns the Shelduck Seismic Survey, Bass Basin, Tasmania, - Permit T/18P exclusive 2D seismic survey 2001 (ORS01), project number 34834, for Origin Energy Resources Ltd. Approximately 425 km of 2D seismic data were acquired along 23 lines and QC controlled to verify that the data were acceptable for further processing. The 23 lines acquired made up a total of 20 full lines, 3 of which were acquired in more than one pass. Only two of these lines were recorded as NTBP. The survey area was entirely within Australian waters. The length of the full lines varied between 17-31 km. Water depths were less than 100 metres. Data were acquired between 4th and 9th June 2001.

Each line sequence was given a unique identifier and has its own Observers' Log. Failures to completely acquire a line in one attempt were related to weather conditions producing unacceptable swell noise levels and navigation failures. An example of line numbering is the following: ORS01-NNR, where ORS01 is the project name, NN is the line number, and R is the re-shoot code (A for the first reshoot, B for the second, etc).

The main priority of onboard processing was generation of a brute stack for every line. Brute stacks were used for quality control in identifying noise and acquisition related problems.

The seismic data were QC processed using Paradigm Geophysical "Focus/DISCO" UNIX workstation-based software. The data were read in from 3590 tapes, then reformatted from SEG-D to internal DISCO format. Noise analysis was carried out over a time window of 4.5 to 5.0 seconds (raw and filtered with a 6Hz filter applied), and the waterbreaks and nearfield auxiliary channels were inspected. Near trace profiles were generated. Velocities were picked every 1 km and used to create a stacked section, which was then archived in SEG-Y format onto 3590 tapes.

6.4.2 Operational Procedures

Acquisition Configuration

Number of streamers	1
Number of source arrays	1 X 4 strings, 2860 cu.inch
Number of CMP lines per sail pass	1
Shot interval	18.75 m
Number of channels per streamer	368
Receiver group spacing	12.5 m
In-line spacing of CMP's	6.25 m
Fold per bin of subsurface coverage	122
Recording length	5 sec.
Sample interval	2 ms
LC recording filter	4 Hz, 18 dB/octave
HC recording filter	206 Hz, 264 dB/octave
Nominal Source depth	5 m
Nominal Streamer depth	7.5 m (line seq#: 01-20, 22-23)
	10 m (line seq#: 21)
Theoretical near offset	150 m

In addition to the configuration described previously, four hydrophones were situated in the cable sections. The first of them is located in the first section with 86 meters distance from the first group. The following hydrophones are situated 200 metres to each other. These are intended for calculation of the water breaks, and were stored on tapes as channel set number 2. Figure 2.1 shows a MSX streamer cable configuration.

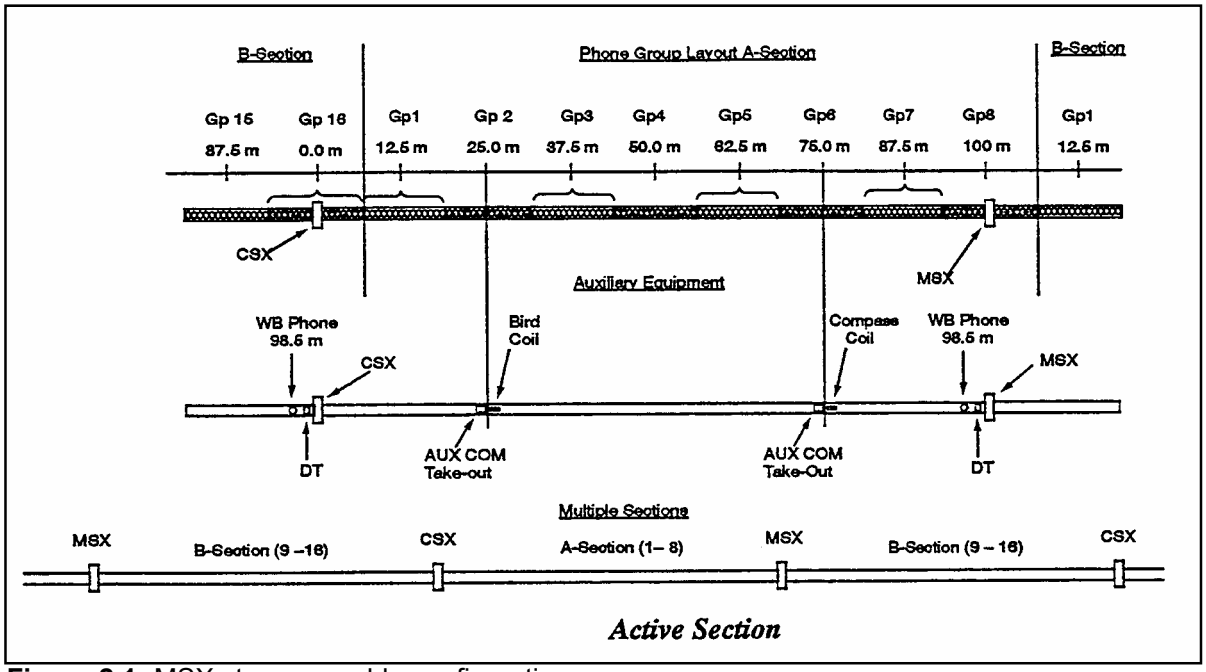


Figure 2.1: MSX streamer cable configuration

Near Field hydrophones (16 auxiliary channels, channel sets 3 to 18) were located on all airguns in the array, and used to check airgun performance and to monitor misfires, auto-fires and air leaks.

Figure 2.2 shows a simplified view of the towing configuration used during the survey

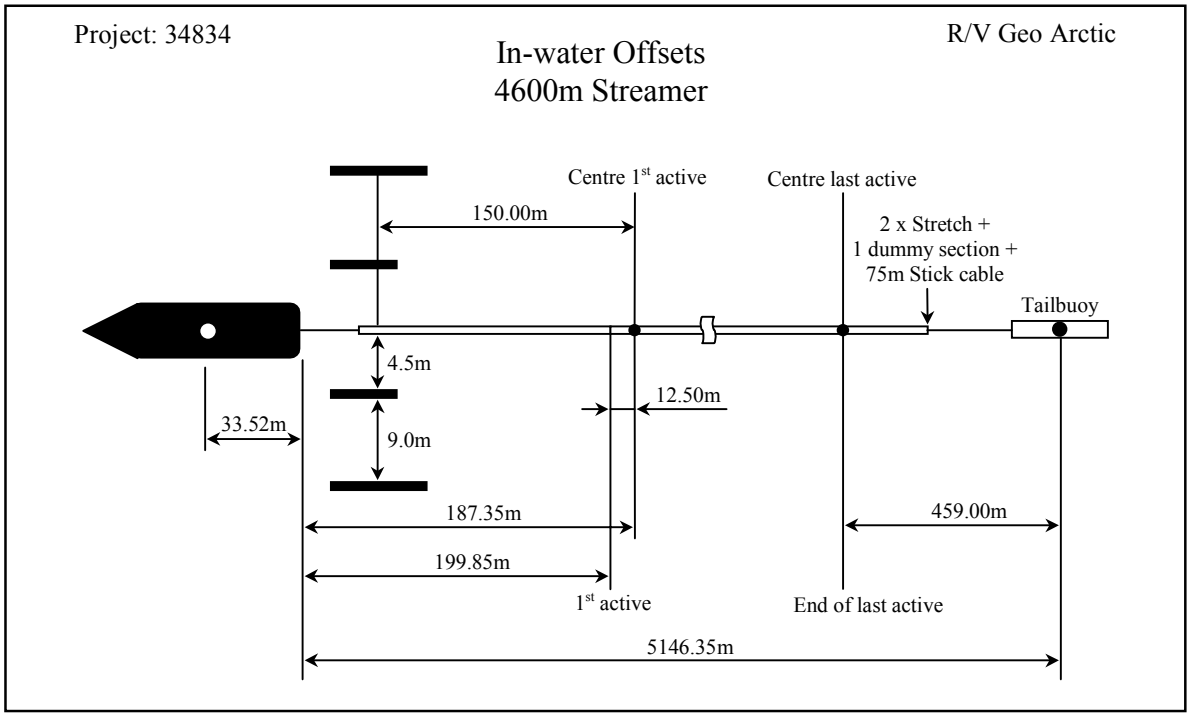


Figure 2.2: A simplified diagram of the towing configuration used for the survey. Configuration is theoretical in terms of all offsets.

Processing Sequence

The main QC-priority was generation of a brute stack for every line, its main use being the identification of noise and acquisition related problems. It should not be used as a substitute for a final product.

RMS amplitude analysis was performed over a noise window between 4500-5000 ms. The intention of this is to give a picture of the ambient noise level as real signals are expected to be negligible at such a time. The noise files generated at both ends of each line were used to assist interpretation. In addition a real-time near trace stack for every line was produced. This is useful for identifying the amount of swell noise and ship noise in the data. Thorough shot examination was performed for the same reasons. Waterbreaks were viewed to check the near offset for each line, and the auxiliary channels were also examined. These are useful for identifying gun auto-fires and errors in timing.

After generation of a brute stack with a single velocity for the entire line, velocities were picked every 1 km. A velocity brute stack was then produced and archived in SEGY format.

The basic processing sequence was as follows:

1. Reformat from SEG-D to internal Disco format:

   Resampling from 2 to 4 ms.

2. View Waterbreak Channels (chset 2):

   QC the waterbreak channels to make sure the near offset remains correct and constant.

3. View Auxillary Channels (chsets 3-18, gun hydrophones):

   View the auxilliary channels to check the gun signatures, enabling airleaks and autofires to be spotted as well as the checking of Observer's Logs for when different guns are turned on and off.

4. View Shotgathers:

   View every 200th shot to evaluate the data quality.

5. Excel noiseplots:

   Plot unfiltered and 6 Hz, 12 dB/oct low-cut filtered RMS noise graphs for all traces averaged over the whole line (in microbars) using Microsoft® Excel™, from a noise window taken over 4500-5000 ms.

6. Scaled RMS plots:

   Create plots showing the average noise for all traces for every shot in microbars (using a noise window over 4500-5000 ms) for both the raw shots and shots with a low-cut filter of 6 Hz, 12dB/oct applied.

7. Near Trace Plot:

   A near trace plot is produced real-time.

8. Velocity Analysis:

   Pick velocities every 1 kilometre.

9. Velocity Stack plot:

   Spherical divergence gain recovery using t^0, v^2. Normal moveout correction using the picked velocities and front end muting using 20% stretch muting and a defined mute. Normalised stacking using 122 fold, followed by a datum shift to correct for source and cable depths, and muting above the waterbottom.

   Generate velocity stack in SEG-Y format.

QC envelopes were filed in sequential order and put in a box available for inspection by the Client Representative in the Processing room. Processed data were backed up on 3590 tapes when QC was finished and thereafter removed from the system.

QC Products

QC data processing was undertaken to ensure that data recorded were of the highest possible quality. This was achieved by analysis of shot records from each line, producing plots of data and displays of stacked sections. In particular the following products were produced.

- Near trace plot in paper format only
- RMS amplitude - noise plots (raw and 6 Hz, 12 dB/oct low-cut filtered)
- RMS amplitude - noise graph averaged over entire line, (raw and 6 Hz, 12 dB/oct low-cut filtered)
- QC-processing history sheet
- Velocity stacks in paper and SEG-Y format
- Velocities as text files.

6.4.3 Summary

Partitioning of lines.

Each line sequence was given a unique identifier and has its own Observers' Log. Data were processed as acquired. Failure to completely acquire a line in one attempt was related to a combination of problems. These were due to inclement weather creating unacceptable noise levels on the data and navigation problems. A spreadsheet with information about line numbers, sequences, and partitioning is given in the Appendix.

Comments

Data acceptability was decided by the Client Representative onboard, after consideration of all the QC products and Observers Logs and records.

The principal scheme of online processing system used on board R/V "Geo Arctic" in the ORS01 survey is shown on Diagram (Figure A).

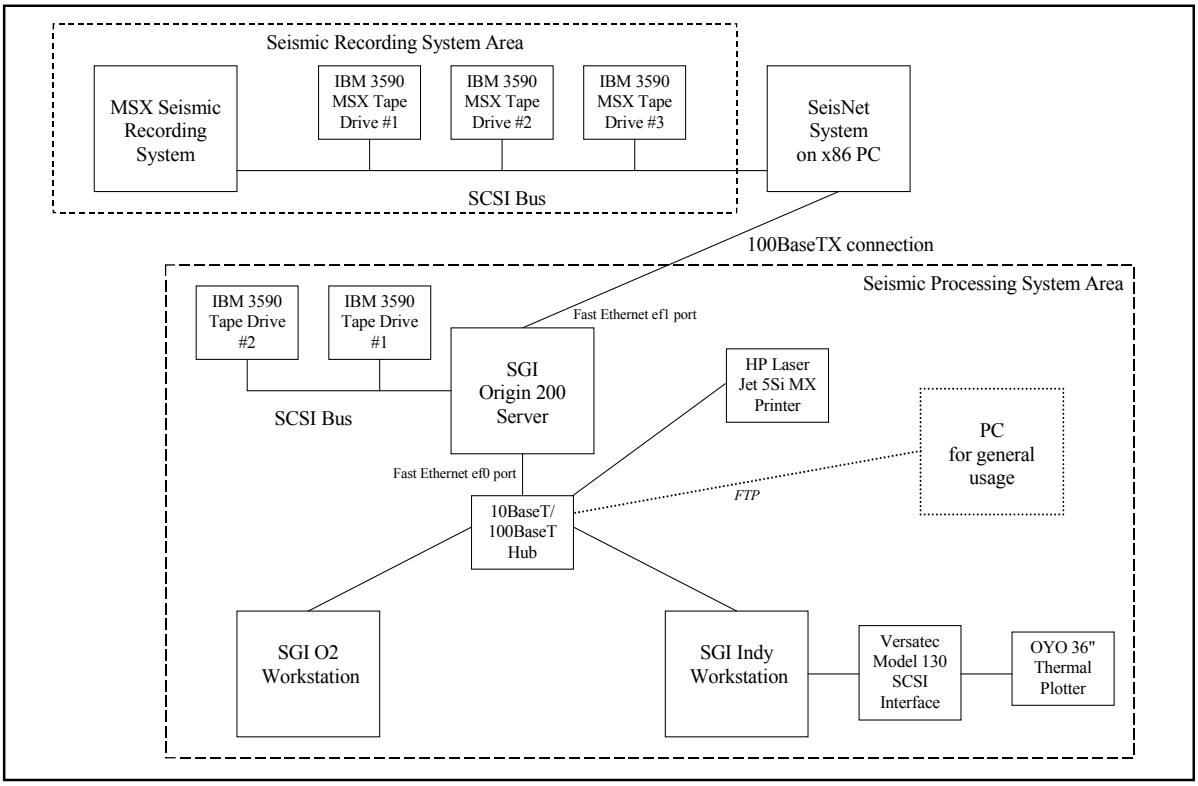


Figure A: The principal scheme of online processing system

6.5 POSITION PROCESSING REPORT

6.5.1 Introduction

The vessel mobilised at sea for the survey on the 04/06/01. Parameter setup in StarfixSeis for seq 001-004 reflected the nominal offsets as proposed for the Survey. After first break analysis minimum offset was determined to be 150m, nominal offset previously entered was143m. The offsets were adjusted in StarfixSeis to reflect the true minimum offset. These changes were in effect for seq 005 onwards. Seq 001-004 were reprocessed with correct offsets so that the P190 reflects the correct offsets.
An extra 100m active streamer section was added to the streamer prior to the first seq, making the actual active streamer length 4600m, 368 groups. This was not contractual however the MSX recording system needs to operate with an even number of sections. The extra section also helps to dampen tugging noise on the tail.
In the P294 setup the extra section has been treaded as a dummy section and active streamer length referred to as 4500m. P190's were made with 360 groups
On seq 021 – 022 after a reboot of the online navigation system, an incorrect parameter file was loaded for P294 logging. The parameters were corrected during nav processing on QCpro, the resultant P190 was computed with correct offsets.

6.5.2 Processing method

Processing was done on QCPro software. Online P294 was imported from StarfixSeis, Some light filtering of compass, echo sounder and Gps was done on the QCPro software and a final P190 made.

6.5.3 Data observation quality

Compass calibration
No dynamic compass cals were done. Any compass showing a noticable bias was set passive and changed at first available opportunity.
Compass data was generally quite good. Streamer rotations onto the active tailbouy were in close agreement, rotation were generally in the region of 0.2°

GPS
Both differential GPS systems Spot and MN8 showed good agreement. Spotbeam was used as the Primary navigation system

Tailbouy
Although not used in the streamer shape calculations, tailbouy position was used in QCpro in the process routine to compute streamer stretch. The Seatex active tailbouy performed very well throughout the survey with only one small period of dropout on seq 002

Gyro
Two gyros were in use on the vessel the primary Gyro a C.Plath is situated in the instrument room and interfaced via a Lekmkuuhl digital gyro repeater, and an SG. Brown 1000B which is situated on the bridge and interfaced directly into Starfix.
Both Gyro's were recorded in the P294.
D/t the filtering setup in QCpro which groups gyro data into an observation data category. Some filtering of gyro data was done. Filter values were kept to a minimum however. Both Gyro's performed well during the survey.

Echosounder

Three echosounder transducers were recorded during the survey Simrad EA500 12 & 27kHz and the Atlas Deso 210kHz. All 3 were written to the P294 file. Generally the Simrad EA500 12 kHz transducer was used as the primary. Water depths throughout the survey were fairy constant between 70-80m.

6.6 MAGNETIC AND GRAVITY REPORT

Gravity and Magnetics data were recorded by the onboard LCT but this was not part of the specification and only done in case the client changed their mind about interest in this data.

6.7 FISHERY REPORT

All fishery departments and associations were informed of the project activities well in advance. No fishing vessel of any kind were sighted during the period of the project.

7 VESSEL SPECIFICATION

7.1 VESSEL GENERAL

Name	R/V Geo Arctic
Owner	Amige SE, Murmansk
Operator	Amige SE, Murmansk
Type	2D Seismic survey vessel
Port of Registration	Murmansk
Flag	Russian
Class	KM ULI A2
Class registration no.:	M-42019
Call Sign	UGXK
IMO no.	8409018
MMSI	273458600
Year Built/Rebuilt	1988 Polen / 1997 Norway
Length overall	81.85 m
Breadth	14.8 m
Draught, loaded	5.23 m
Tonnage	3225 T, 967 Net T
Cruising Speed	Max 14.5 knot, cruising 12.5 knot
Operation Range	60 days cruising, NM
Endurance seismic	60 days
Main Engine	Zgoda-Zulcer, Type 6ZL 40/48, 4200 HP,(3090 Kw)
Gearbox	Zamech MA90-10, ratio 505/222,6
Propulsion	Zamen, Controllable pitch. LN 13 NM, 4 blade Stainless steel,
Rudder	Traditionally
Steering gear	Zamech
Azimuth thruster	N/A
Bow Thruster	Brunvoll FU-45-LTC-1225, electrical, 600 HP / 441 Kw
Main engine monitoring	Polen
Electrical Power	Total power 2200 Kw Voltage: 3 x 380 (220) VAC, 50 Hz. Shaft generator,1 x 1200 Kw Generator 2 x 500 Kw
Emergency generator:	217 PMa-39H6. 121 Kw
Clean power:	Rotation generators and several small UPS.
Fuel capacity	1000 m^3
Fuel consumption	Sailing 12.8 t, working 8.4 t, in port 2.8 t
Fresh water capacity	200 ton
Fresh water generator:	VY 125 AD. 7 ton full speed.
Fresh water generator	10 ton full speed, 1 ton in port
Sewage treatment plant	LK-30(2)
Incinerator	Yes
Black water	9,9 m^3
Grey water	N/A
Bilge water	12,0 m^3
Sludge	12,0 m^3
Waste water	3,2 m^3
Lub oil	26,2 m^3
Dirty oil	11,7 m^3
Stabilising system	N/A|
Deck Machinery	

Crane	4 ton, 12.5 m max., 2.5 m min. 1 x 1 ton provisions crane front deck 1 x 1 ton folding crane, top aft deck
A-frame	N/A
Winch	2 x Streamer, 6000m aft reel, 3000m fwd reel. Spare streamer, 2 x 2000m Gravity / FF Magnetometer
Paravane	N/A
Gate valve	N/A
Hydraulic power pack:	Hydrakraft A/S. 2 x 45 Kw. 2 x 130 l/min. 220 Bar.
Accommodation	Single cabins 17 + 2 hospital Double cabins18 Total capacity 55 persons
Galley stores:	2 x Deep freeze 16,2 and 12,2 m^3 2 x Cool room 14,1 and 21 m^3 1 x Dry store 28,5 m^3 1 x Vegetable 13,5 m^3
Mess:	Seating capacity: 31 Size 42 m^2
Day room:	2 x Smoking / Non-smoking 17,2 m^2 and 15,9 m^2
Exercise room	20,7 m^2
Air condition:	Tropical
Helicopter landing zone:	Superpuma 9.8 ton

7.2 VESSEL NAVIGATION AIDS

Auto Pilot	Polish (TS-75)
GPS	Furuno GP50 MK II
Radar no.: 1	1 x Kelvin Hughes; 6000, Nucleus 2, ARPA, 10 cm
Radar no.: 2	1 x Nayada-5, Russian 3cm
Gyro no.: 1	1 x Plath, Navigat II with Lehmkuhl LR40 gyro repeater.
Gyro no.: 2	1 x SG Brown Meridian
Speedlog	1 x Atlas Dolog 1 x IEL-2M (Russian)
VHF direction finder	N/A
Wind sensor	Aanderaa 3017 Speed, direction and temperature
Nav. Echo Sounder	GEL-3
Electronic chart:	N/A
Navtex	Furuno NX-500
Weather fax	None

7.3 VESSEL COMMUNICATION AIDS

GMDSS	A1, A2 and A3 Sailor VHF & VHF
Satellite Fixed line:	Telenor Sealink Light. NorSat. Phone, modem and fax.
Inmarsat	Saturn B, Phone, high speed data modem; 64 KB and fax
GSM	2 x Phone,
WAN	Data modem
M/F, H/F	Skanti TRP 7201
VHF stationary	Skanti VHF 3000 Sailor VHF RT2047D Sailor VHF RM2042. (GMDSS)
VHF portable	3 x Tron VHF
UHF portable	3 x Headcom
UHF helicopter communication	Jotron TR-7510
Non-directional beacon	AS Telesupply TS-20B
Watchkeeper	Sailor GMDSS A3
Internal communication	Stationary all rooms.
Telephone numbers	
GSM Bridge	+ 47 9076 4256
NMT Bridge	+ 47 9419 8081
Inmarsat FGAS	+ 871/873 3273 18612
Inmarsat Bridge	+ 871/873 3273 18610
Inmarsat Client	+ 871/873 3273 18611
NorSat FGAS	+ 47 22134789 Tel/Fax
NorSat Bridge	+ 47 22134791 Tel/Fax
NorSat Vessel	N/A
NorSat Client	N/A
Fax numbers	
Inmarsat	+ 871/873 3273 18613
Norsat	+ 47 2213 4789

7.4 VESSEL SAFETY

Safety manning level:	55 persons
Covered lifeboat:	Totally enclosed 8.5m, fire protected, model JY-QFN-8.5, seats upt tp 65 persons
Rescue /MOB Boat	Lifeboat used for MOB
Work boat	Norpower 22ft, 7m open boat
Inflatable Life Rafts	9 x 10 persons
Man overboard Liferaft	2 x 6 person life raft
Survival Suits	100 %
Life Jackets	100 %
Life rings	8
Smoke hoods	100 %
Work vest	4 x Crewsaver
Emergency radios	Sailor GMDSS A3
Emergency beacons	1 x McMurdo E3 EPIRB
Radar transponders	2 x Jotron TronSart
Fire detector system:	INCO UCPP-20
Fire pumps	1 x 100 t Electrical driven 1 x 40 t, Electrical driven
Fire suits	3
Halon systems	Engine room
CO2 systems	Compressor room and streamer store
Foam systems	Streamer deck.

8 EQUIPMENT SPECIFICATION

8.1 SEISMIC RECORDING INSTRUMENT

Type	Input / Output, MSX, 24 bit system
Number of Channels	720 ch. max
Number of waterbreaks	4 channels
Number of auxiliary	16 channels
Sample Rate	1, 2 and 4 ms
Filters	Low cut, high cut
Low Cut	Out, 2 Hz, 6dB/octave 2 Hz, 12 dB/octave 4 Hz, 12 dB/octave 6 Hz, 12 dB/octave 8 Hz, 18 dB/octave
High Cut	1 mS: 412 Hz, 264 dB/octave 2 mS: 206 Hz, 264 dB/octave 4 mS: 103 Hz, 264 dB/octave
Tape Format	SEG-D
Recording Medium	4 x IBM Magstar 3590
QC System	All QC data, QC plots - AGC or fixed gain; harmonic distortion analyses; noise analyses; spectral analysis;
On-line Display	Oyo GS 624-2
Processing	
Hardware	Silicon Graphics Origin 200 with dual MIPS 10000 64 bit processor SCSI Raid disc controller rack with 40 GB capacity (160 GB) Oyo 36" thermal plotter , I/O 8MB/sec
Software	Paradigm Disco/Focus v. 4.1
Capacity	
Tape drives	2 x Magstar IBM 3590 tape drive
Data compression software	N/A

8.2 STREAMER

Type	Input / Output, MSX digital
Max. length	9000 m
Max. outer separation	N/A
Available Group interval	12.5 / 25 m
Section length	99.5 m
Group pr. Section	8
Hydrophone type	Input / Output, Preseis WM1-018B
No. of Hydrophones /Group	14 hydrophones (2.5 m), tapered array, centre weighted. 29 % overlap, total group length 17.55 m
Streamer diameter	63.5 mm
Streamer sensitivity	14 V/Bar
Fault locator	Input / Output
Depth Controller / Compass	Digicourse 5010/5011
Acoustic	N/A
Cable oil clean:	2250 + 960 ltr.
Cable oil dirty:	1.920 ltr.

8.3 ENERGY SOURCE

Type	Sodera G-gun
Size of guns:	40, 70, 100, 150, and 250 cu. Inch.
Max volume:	3660 Cu inch.
Max output. 5 m depth. 0-128 Hz:	3660: 103,3 Barm
Number of Sub. Arrays	4
Configuration:	Single source
Tow width	30 m
Firing control	Hydrapulse 200X
QC	Hydrapulse
Depth transducers	4 x 2
Tow system:	Norwegian buoys
Offset	144m with 6000m streamer. 250m with 9000m streamer
Compressor	1 x LMF, 1100 SCFM 4 x EKA, each 390 SCFM
Compressor capacity	2660 SCFM
Pressure:	2000 PSI

8.4 NAVIGATION EQUIPMENT

On-line Navigation System	Starfix.Seis. (Fugro system)
Primary Navigation	MRDGPS, No differencial corrections
GPS receiver	Trimble 4000DS 9 channels nav ver. 7.28
Secondary navigation	GPS / GLONASS
GPS receiver:	Ashteck GG24
Tail buoy tracking	Geotrack RGPS (Fugro) and radar.
Gun array tracking:	N/A
Acoustic	N/A
Laser	N/A
VRU:	Seatex MRU-6
Navigation processing	N/A
Binning	N/A
Multi beam echosounder	N/A
Echosounder	Simrad EA500
Echosounder transducer	12 / 27 khz Maximum range 6000 meter
Streamer Control	Digicourse 5011 Compass
Speed log:	Atlas Dolog, not interfaced to nav system.
CTD probe	Valeport Model 600 Mk3 CTD probe
SVP probe	N/A
Water level recorder	N/A

8.5 GRAVITY / MAGNETICS

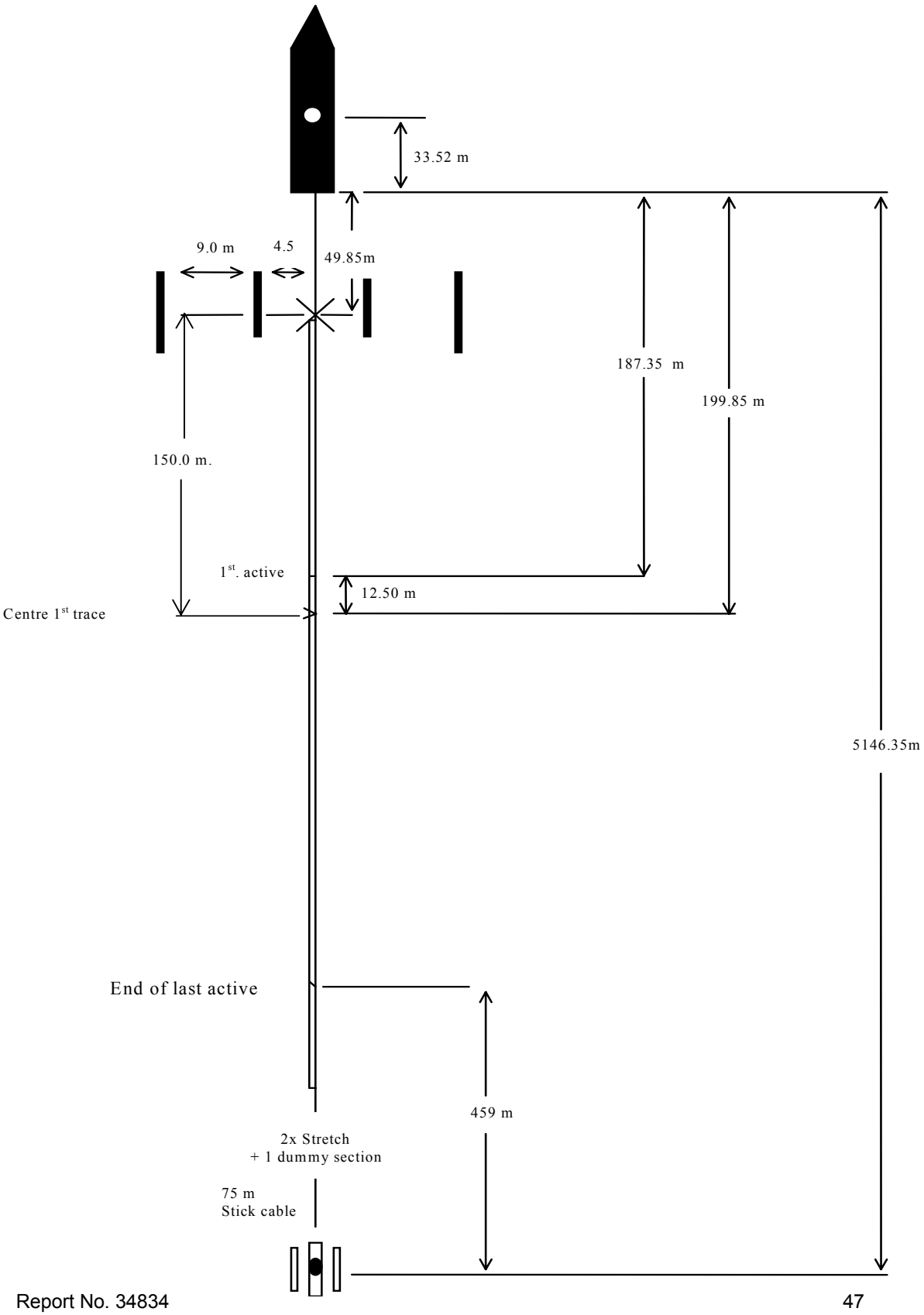
Gravity Meter Type	L & R Model S Marine Gravity Meter. Serial No S-65 with ZLS upgrade and Unison DAS.
Magnetometer	Elsec Console

9 DRAWINGS

9.1 OFFSET DIAGRAM

Project: 34834 **Inwater Offset for Origin Energy Resources Ltd** M.V. Geo Arctic

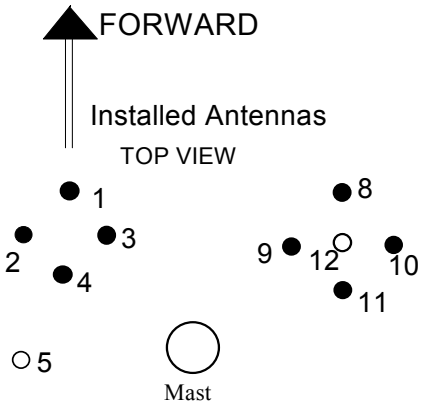
4600m Streamer, 18.75 m Shots



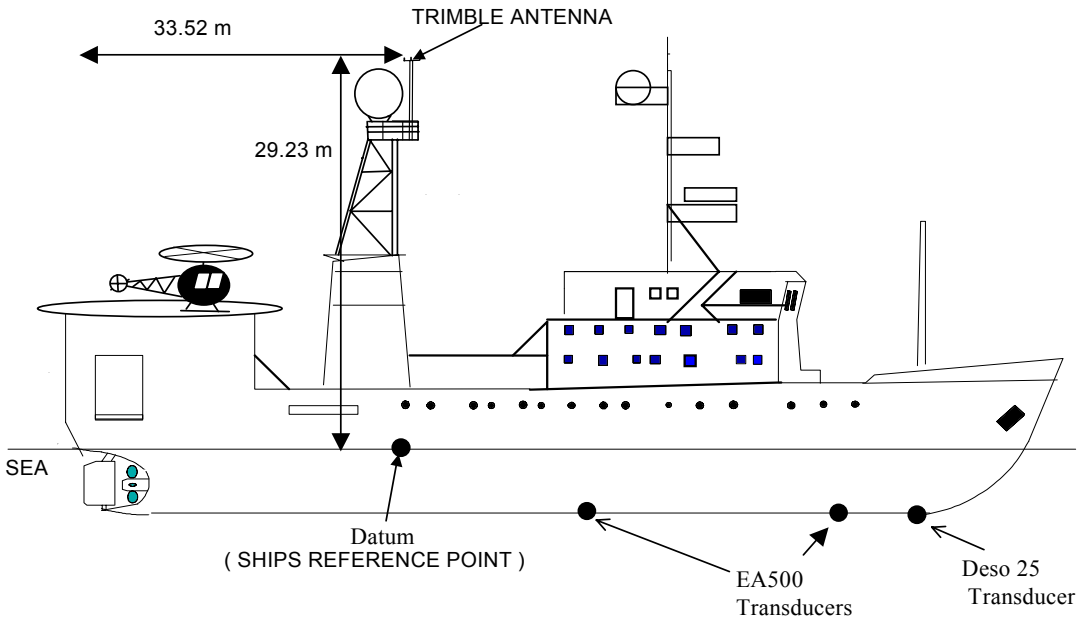
9.2 VESSEL OFFSET

R/V Geo Arctic. (updated 27 April 2001)

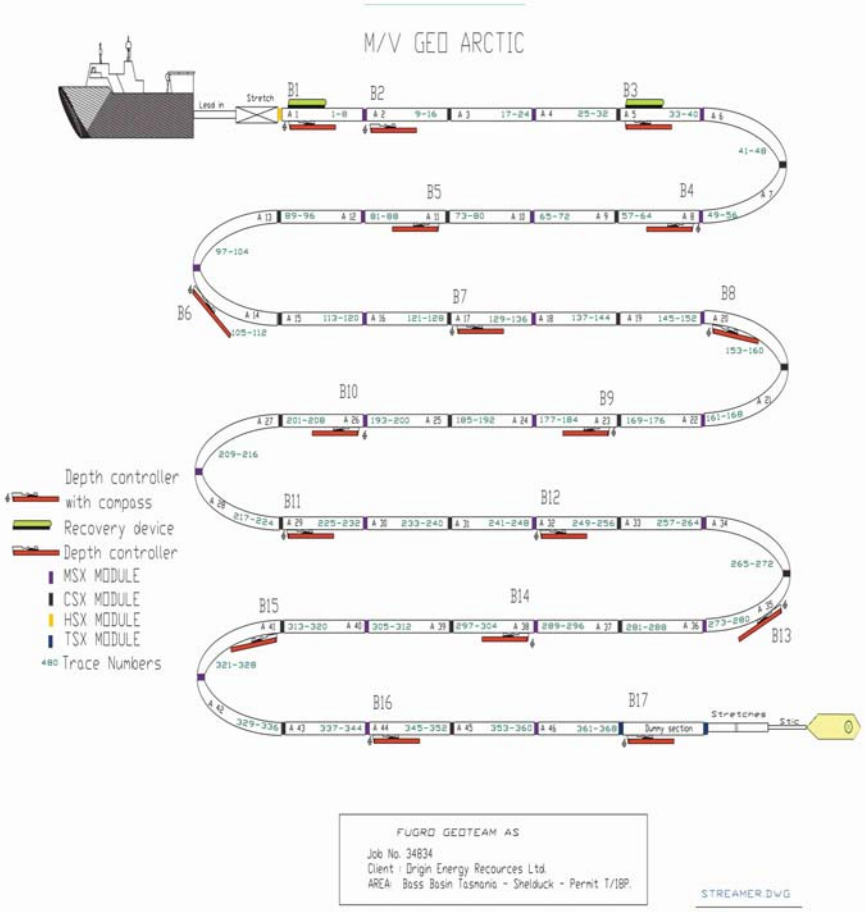
ANTENNA OFFSET



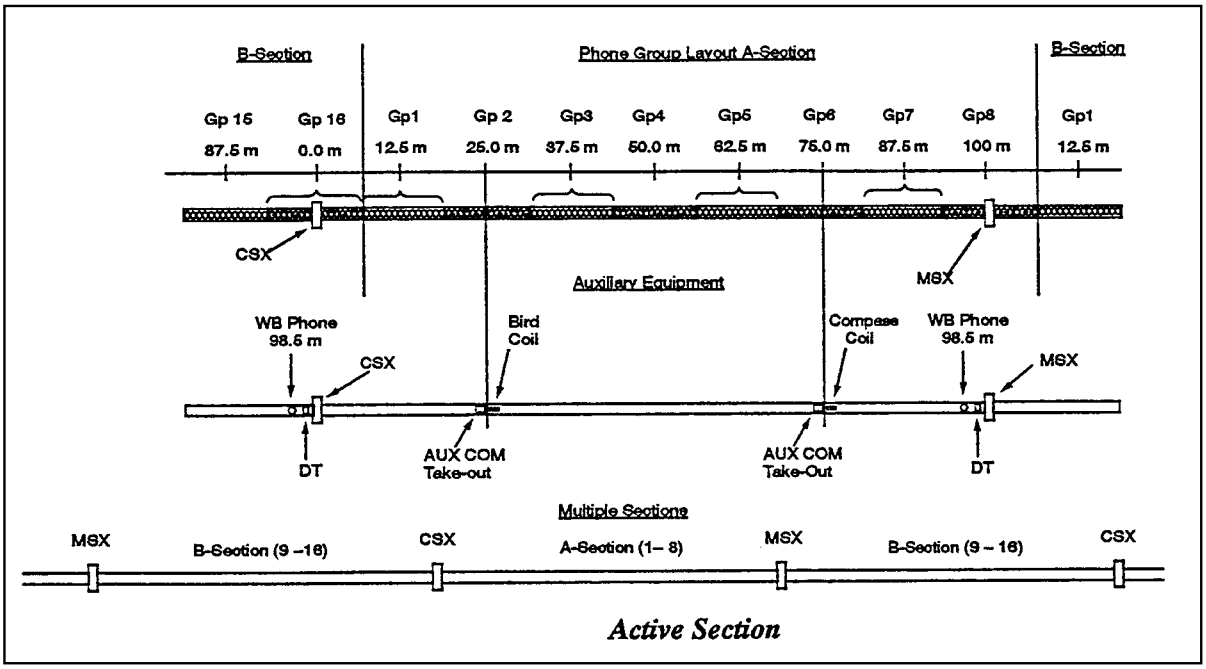
		X m	Y m	Z m
	Datum. Mast S/L	0.0	0.0	0.0
	Mid. stern	0.0	-33.52	0.0
	EA500 27 kHz tran	-1.21	18.53	-4.97
	EA500 12 kHz tran	-0.64	31.61	-4.98
	Deso 25 transducer	0.01	35.73	-4.99
	Survey Gyro	-2.4	9.60	1.0
1	Primary Trimble	-1.51	1.07	29.23
2	Secondary Trimble	-1.86	0.72	29.23
3	Spare Trimble	-1.16	0.72	29.23
4	Glonass	-1.51	0.37	29.23
5	VHF antenna			
6	Seatrack Wipe ant.			
7	Seatrack Panel ant.			
8	Norsat GPS	1.51	1.07	29.23
9	Spotbeam	1.16	0.72	29.23
10		1.86	0.72	29.23
11	Spotbeam	1.51	0.37	29.23
12		1.51	0.72	n/a



9.3 STREAMER CONFIGURATION

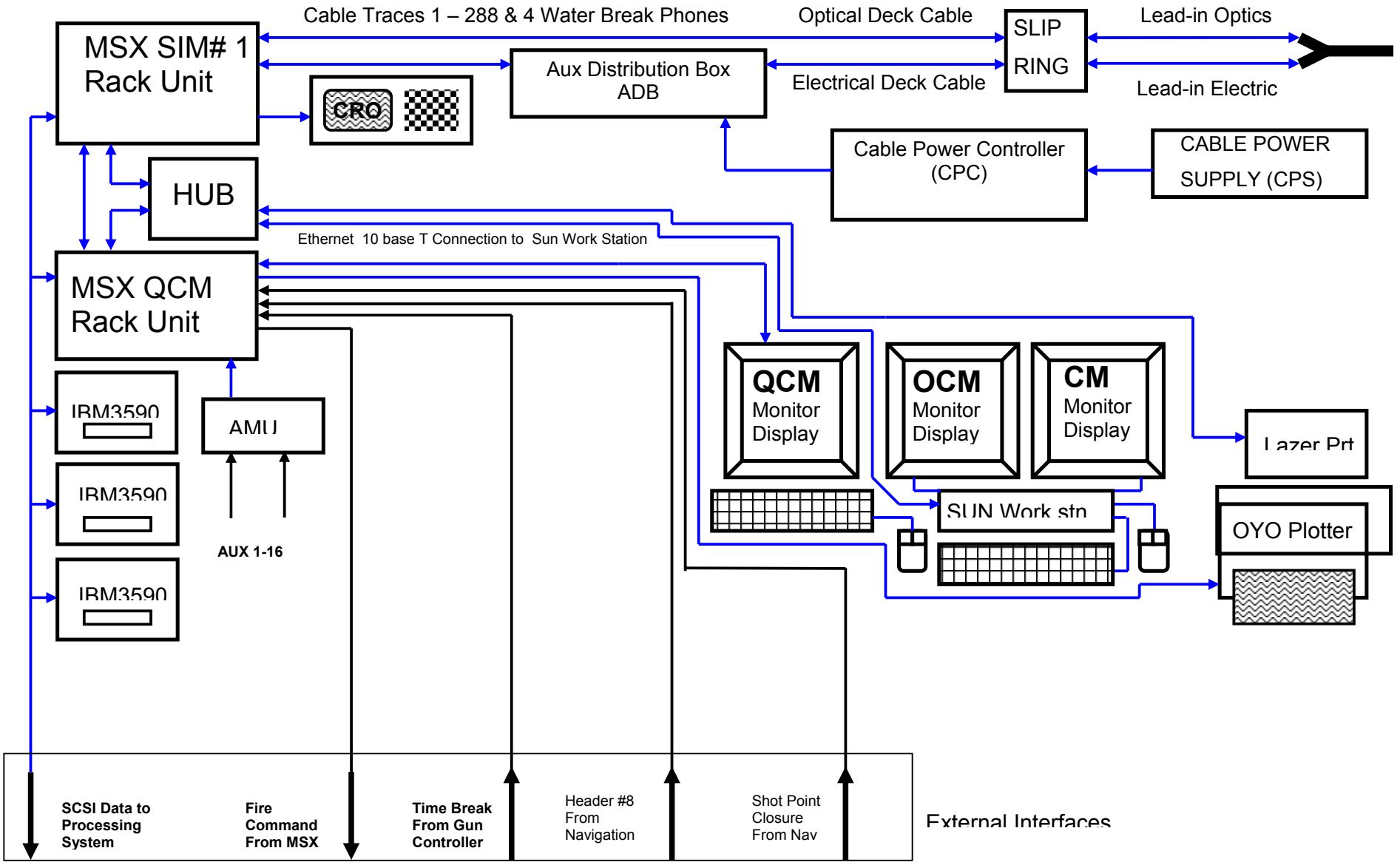


9.4 HYDROPHONE GROUP CONFIGURATION



9.5 INSTRUMENTATION

MSX System Overview



Introduction

The MSX is a 24 bit digital seismic acquisition system designed for marine applications. In its basic form it is capable of recording data from up to four digital streamer cables and 16 auxiliary channel inputs at user defined record length, sample rates and applied filter settings. Fiber Optic streamer communication ensures electrical noise immunity and provides fast Data sample rates. Ethernet connection between sub assemblies ensures reliable communications. Overall control and monitoring of the streamer data and recording Electronics is provided by software running on a Sun workstation.
QC information for each shot point file is output to High resolution Monitor displays, Laser printer and an Oyo Plotter.
The end product is a SEG-D 8058 data file written onto IBM3590 cartridge tape drives.

Instrument System

MSX Ship board Hardware overview
Fig 1. Shows the arrangement of the main Ship board components of the MSX Recording System. A Brief functional summary is listed below.

Lead-in Termination.
The Ship end of the armored lead-in cable terminates in an one Optical and one Electrical bundle within the central drum of the back deck streamer winch.
The Optical termination transits three fiber optic filaments; one Control/Data path to the streamer and two 'A & B' data paths from the streamer.
The Electrical termination transits the AC Cable Power, Break detect, leakage detect and Bird communications pairs.

Slip Ring
The lead-in terminations connect to an Optical-Electrical Slip ring assembly, which allows for transit of the control and data signals and facilitates rotation of the winch whilst retaining continuous connections to the Recording system.

Deck cables
From the Slip ring, the Optical streamer data is directly connected, via a long optical 'Deck cable' , To the Streamer Interface Module(SIM)
The Electrical deck cable connects to the SIM via the Auxiliary Distribution box (ADB)

Auxiliary Distribution Box (ADB)
The Auxiliary Distribution box (ADB) is effectively a transit 'break out box' for monitoring cable status, feeding cable power and Bird control signals to the in water equipment.

Streamer Interface Unit (SIM)

The SIM converts the fiber optic streamer data samples back into electrical logic level signals. The sequential samples are de-multiplexed, filtered and saved into a temporary buffer. At the same time the data is made available on the SCSI bus for analysis by the QCM module. When a recorded shot file is complete, the SEG-D data file is output from the SIM to the SCSI bus for writing to the 3590 tape drives.

Quality control module (QCM)
The QCM controls the timing of a Shot Cycle, inserts the header block from Navigation and provides graphical display and subsequent analysis of the data recorded into the SIM memory. Graphical display and analysis is performed by a single board Sparc processor running proprietary unix based software.

Oscilloscope Display (CRO)
Under control of the OCM and directly interfaced to both the SIM and the QCM Chassis, the Multi channel Digital Oscilloscope is used to display Seismic trace data and information on transmission timing for QC and cable fault finding.

Auxiliary Module Unit (AMU)
This unit, consisting basically of a single streamer module, provides for recording of 16 external auxiliary channels. Typically these input channels are used to record Near field hydro phone data from the gun Strings.

Cable power supply (CPS)
The CPS supplies a 2 KHz constant current AC power supply. Under the control of the CPC it generates the ac power that supplies all in-water electronics modules and the tail buoy .

Cable power controller (CPC)
The CPC controls the output of the CPS in terms of Current and voltage.
The unit also monitors for current imbalance, Ground faults, Leakage and Breakage of the streamer .

IBM 3590 Cartridge Tape drives.
The Magstar IBM3590 Cartridge tape drives are used for storing the sequential shot records. The cartridges used have a capacity of 10 GB. The 3590 writes data in 128 track sepantine longitudinal format.

QCM Monitor Display.
The Quality control monitor (QCM) monitor is directly connected to the Sparc Single board Computer within the QCM Chassis. It provides a 'near' real time graphical plot display of selected streamer data. It is also used to display the results of system test files used to analyze system performance. With keyboard and mouse, the unit allows the operator to make on line changes to the graphical displays.

OCM Monitor Display.
The Operator Control Monitor (OCM) is the main recording system console and consists of a Sun Work station that is interfaced to the main recording system via a Hub and 10Base-T Ether net cable. Proprietary software

running in a Solaris(Unix) environment provides the Operator full access to all MSX functions. Input is via Keyboard and mouse.

CM Monitor Display.
The Cable Monitor (CM) is a secondary monitor of the OCM Sun Work station, controlled using the common Keyboard and mouse. It provides the operator with a real time graphical display of Hydro phone Data and status information. The display can be used to provide graphical and numerical display of all the background QC data output by the streamer electronics such as temperature, voltage, depth, fiber optic status and telemetry error data.

Oyo GS 624-2 Plotter
The 24 inch Oyo thermal Plotter is directly connected to the Sparc Single board Computer within the QCM Chassis. It provides for on-line hard copy of the shot records for QC purposes.

Laser Printer
The Printer is Connected Via Hub, to both the QCM and OCM. It is used for hard copy output.

External Interfaces to the MSX

Shot Point Closure / Start From Navigation
When the vessel Source is calculated to be Over the Shot point location the Navigation System sends a closure signal to the MSX which initiates a recording cycle.

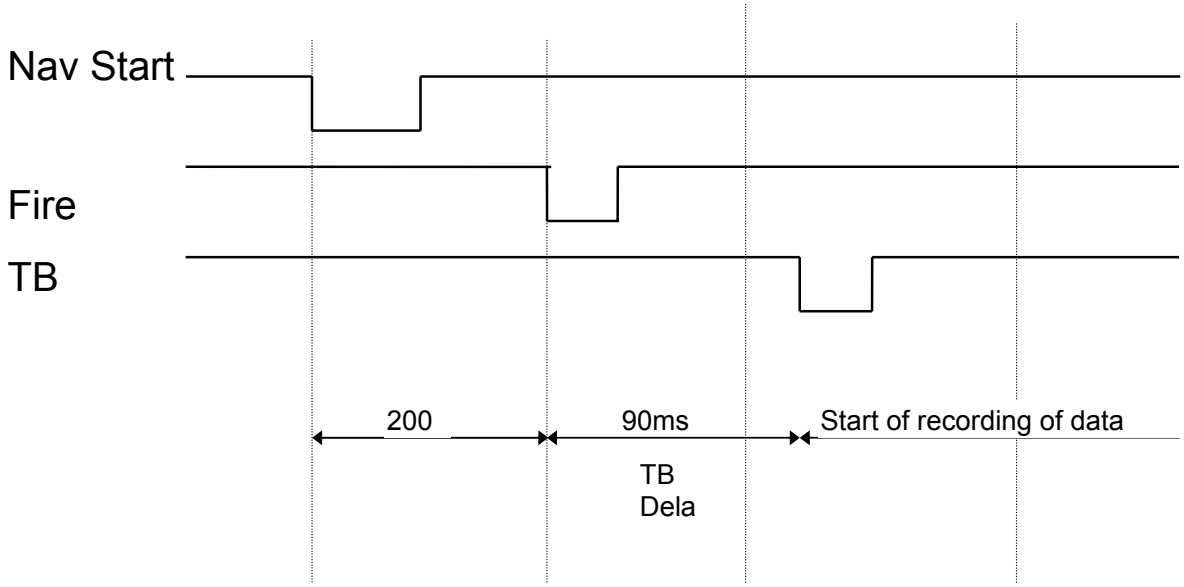
Fire Command From MSX
Following receipt of the Shot point closure from Navigation, the MSX recording system initializes its internal buffers in preparation for a record.
A Source fire command signal is output by the MSX after a fixed 200 mS delay.
This fire command is used to start the fire sequence for the Source control sytem.

Time Break To MSX
When the guns have fired, the Source controller outputs a 'Time break' signal.
The leading edge of this time break pulse, refered to as T0 initiates the start of a Shot record.

Header #8 From Navigation
User header version #8 is generated by the Navigation System and sent to the MSX for recording with the seismic data. It contains data blocks from the navigation, Gun controller and cable depth controller systems. The header contains all the contractually relevant data for each recorded shot point and is transmitted immediately when all data is ready.

SCSI to Processing System
The data written to tape is available for Real Time on-line processing via the SCSI Bus.

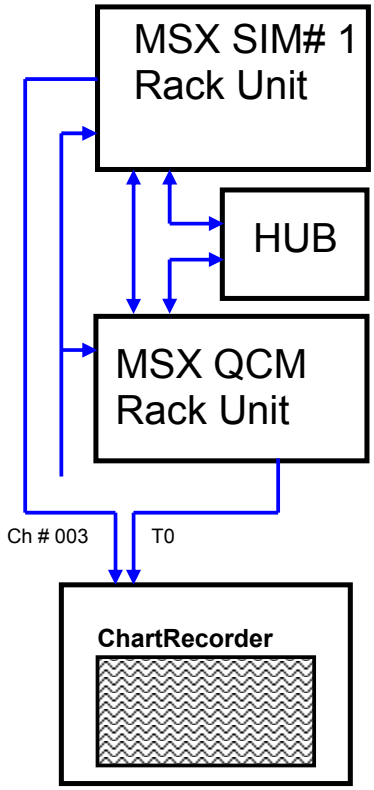
External Interface Timing



Near Trace Plotter

Introduction
Streamer Channel # 3 was used to produce a continuous thermal plot for QC purposes..

Ship board Hardware overview
The Diagram below shows the arrangement of the main Ship board components of the Near Trace thermal plotter installation.
T0 from the QCM was used to Trigger the Plotter. Seismic trace #3 was selected for output at the MSX OCM scope menu at a gain of 36 dB.



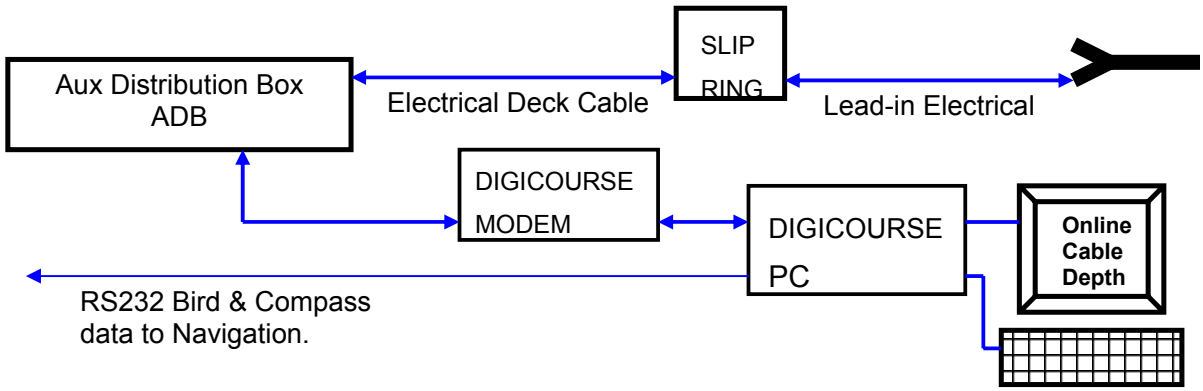
Digicourse Bird Controller

Introduction

Streamer depth was controlled using 14 Digicourse cable levelers or 'Birds'.

Ship board Hardware overview

The Diagram below shows the arrangement of the main Ship board components of the Digicourse Cable leveler system. The Modem Unit is interfaced to the Streamer cable Via the ADB and is used for bi-directional communications with the Individual Cable levelers or 'Birds'.
Data from the Bird controller is polled by the Navigation System each shot point and transferred via RS232 Interface.



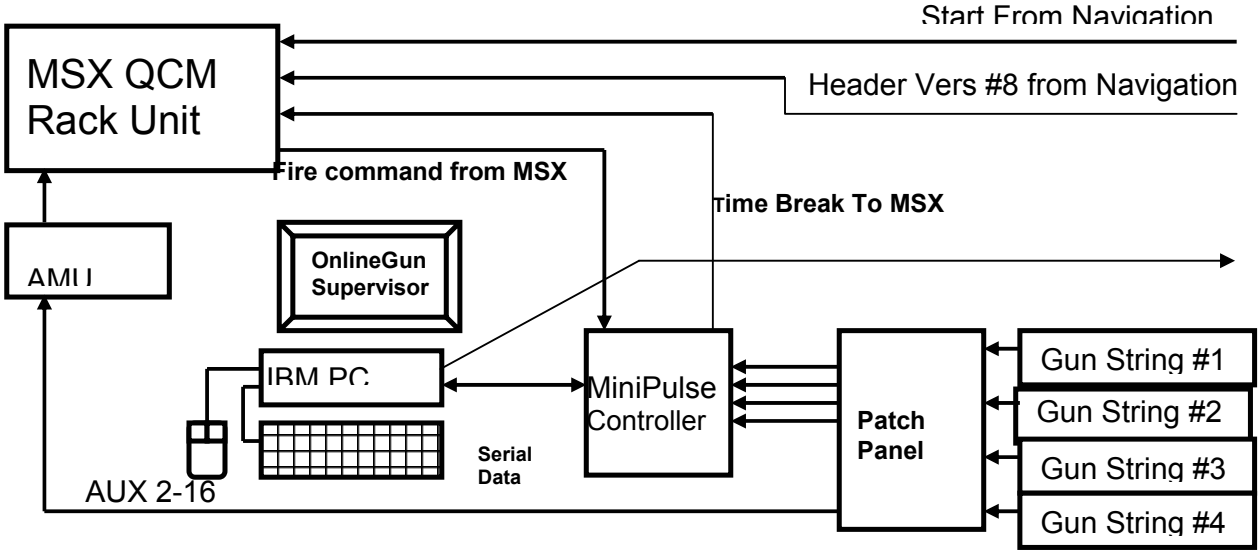
HydroPulse Gun Controller

Introduction

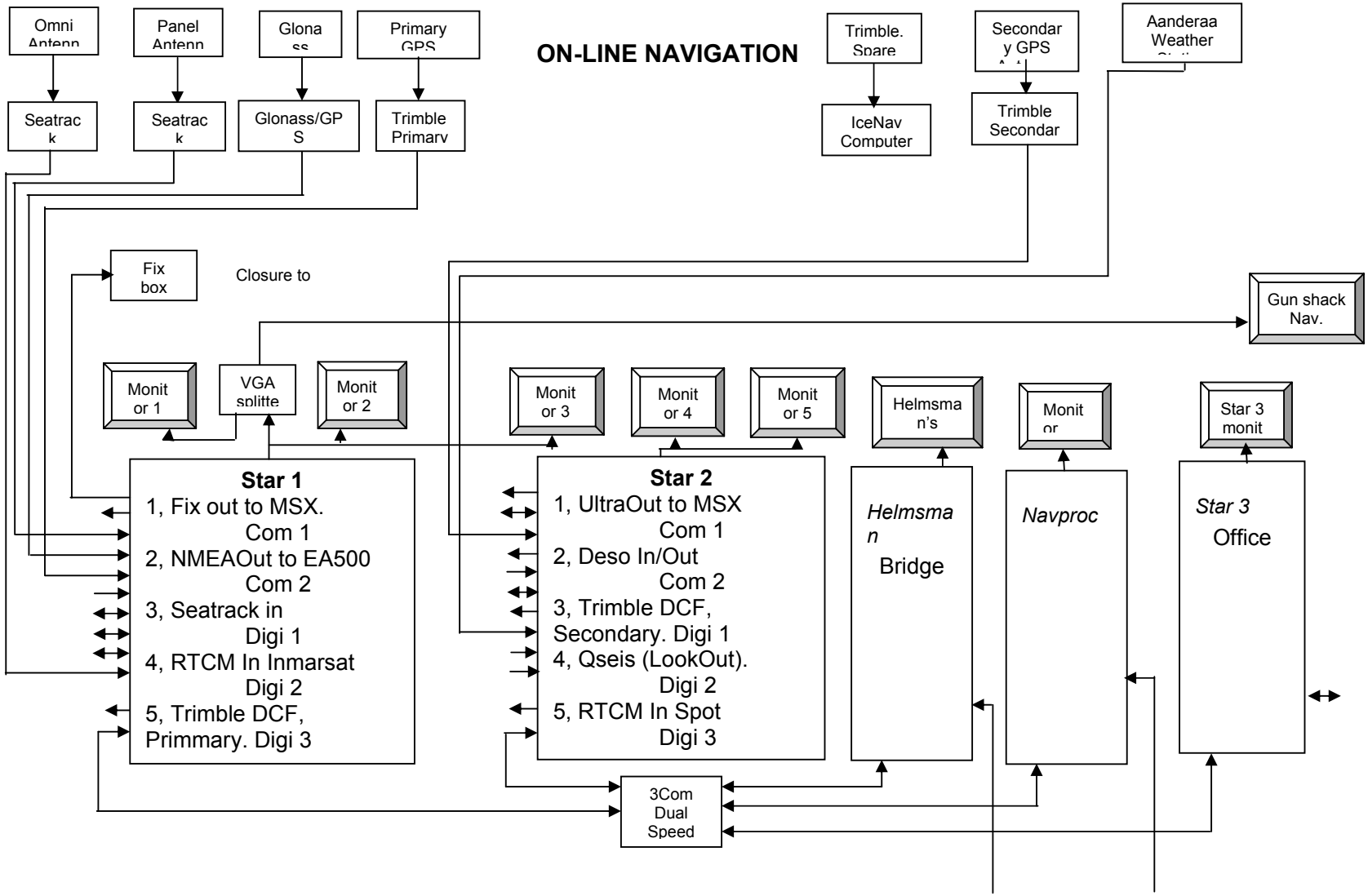
The seismic source was made up from 30 Soldera G-Guns (30 + 3 spares) with a total volume of 3660 cu Inches. The firing times of the Guns was controlled by the HydroPulse 200X mini Pulse system.

Ship board Hardware overview

The Diagram below shows the arrangement of the main Ship board components of the Hydro pulse Gun Controller system.
RS232 Serial Gun Data is sent to the Navigation System after each shot point.

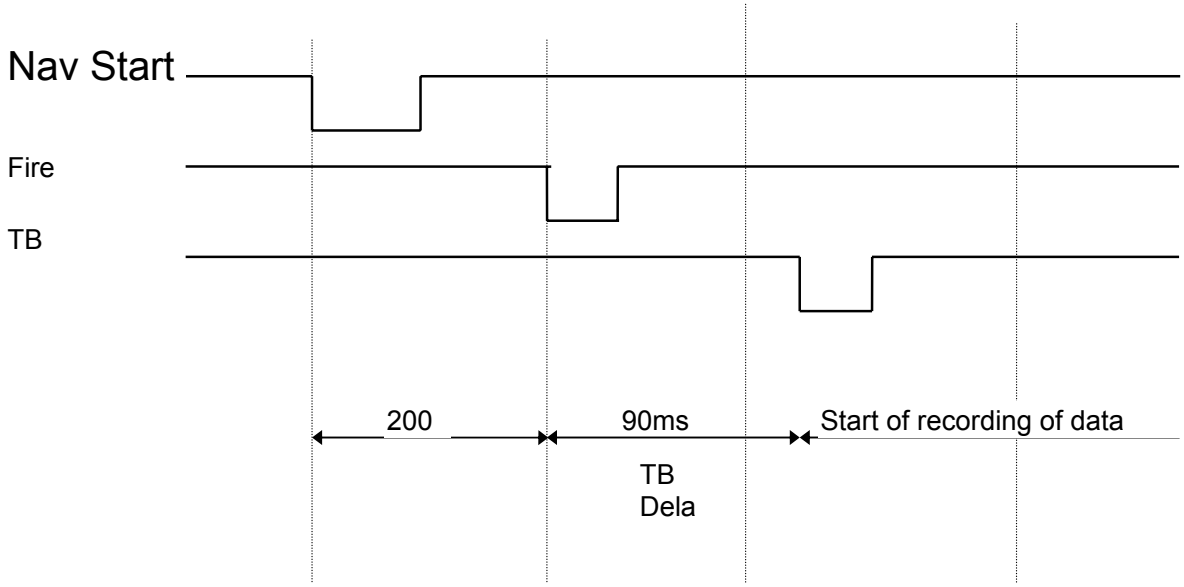


9.6 NAVIGATION LAYOUT

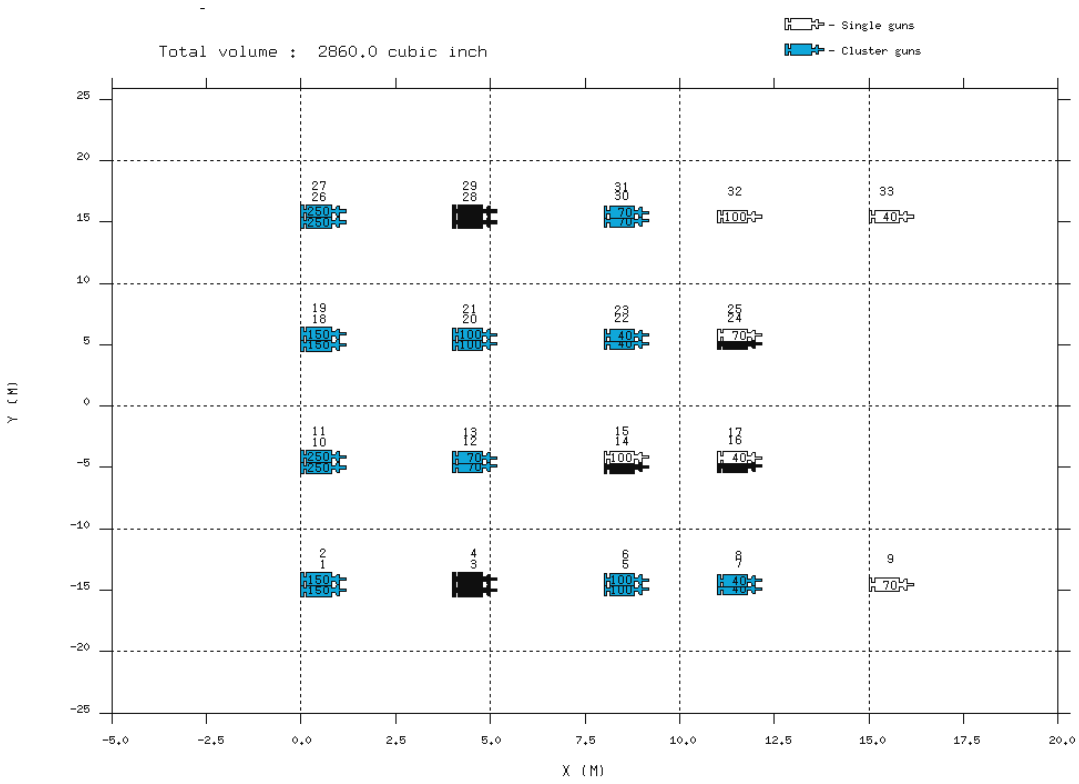


9.7 SYSTEM TIMING

External Interface Timing



9.8 SOURCE LAYOUT



A P P E N D I C E S

GENERAL

1. DAILY LOGS

2. LINE SUMMARY

3. ENERGY SOURCE DROP OUT SPECIFICATION

4. WEATHER REPORTS

5. SAFETY ACCIDENTS / NEAR MISS REPORTS

POSITION

6. NAV QC LOG

7. PRODUCTION LOG

PROCESSING

8. NAV PROCESSING SUMMARY LOG

9. HARDWARE

10. SOFTWARE

11. LINE LOG SPREADSHEET

1. DAILY LOGS

Time Zone: UTC + 10 hours

04 June 2001

Start	End	Charge	Hrs	Activity	Details
00:00	07:00	Yes	7.00	Mob / Demob	Transit to cable deployment area
07:00	11:45	Yes	4.75	Mob / Demob	Deploy 4..7km cable and trim balance.
11:45	12:29	Yes	0.73	Mob / Demob	Deploy guns.
12:29	14:02	Yes	1.55	Mob / Demob	Approach first line and soft start guns.
14:02	16:23	Yes	2.35	Production - 2D	ORS01-03 sp 1000-2091 completed.
16:23	18:23	Yes	2.00	Line change	
18:23	18:36	Yes	0.22	Extended line	
18:36	20:02	Yes	1.43	Production - 2D	ORS01-13 sp 2707-2033 aborted
20:02	23:57	No	3.92	Navigation	Circle due to navigation crash
23:57	23:59	No	0.05	Navigation	ORS01-13A 2163-2143 overlap

05 June 2001

Start	End	Charge	Hrs	Activity	Details
00:00	00:14	No	0.23	Navigation	ORS01-13A sp 2142-2033 Overlap
00:14	02:41	Yes	2.45	Production - 2D	ORS01-13A sp 2032-869 Completed.
02:41	04:41	Yes	2.00	Line change	Nominal line turn
04:41	05:13	Yes	0.53	Extended line	
05:13	08:24	Yes	3.18	Production - 2D	ORS01-12 sp1000-2518 Completed
08:24	10:24	Yes	2.00	Line change	
10:24	10:43	Yes	0.32	Extended line	
10:43	12:43	Yes	2.00	Production - 2D	ORS01-10 sp1828-870 Completed.
12:43	14:36	Yes	1.88	Line change	
14:36	16:41	Yes	2.08	Production - 2D	ORS01-08 sp1000-1986 Completed.
16:41	18:12	Yes	1.52	Line change	
18:12	20:38	Yes	2.43	Production - 2D	ORS01-04 sp2014-870 Completed.
20:38	22:19	Yes	1.68	Line change	
22:19	23:59	Yes	1.68	Production - 2D	ORS01-02 sp 1000-1783 continues.
23:59	23:59	Yes	0.00	Production - 2D	Midnight sp 1783

06 June 2001

Start	End	Charge	Hrs	Activity	Details
00:00	00:46	Yes	0.77	Production - 2D	ORS01-02 sp 1784-2144 completed.
00:46	02:21	Yes	1.58	Line change	
02:21	04:18	Yes	1.95	Production - 2D	ORS01-01 sp 1802-870 completed.
04:18	06:18	Yes	2.00	Line change	
06:18	06:33	Yes	0.25	Extended line	
06:33	08:39	Yes	2.10	Production - 2D	ORS01-05 sp 1000-1984 completed.
08:39	10:39	Yes	2.00	Line change	
10:39	11:07	Yes	0.47	Extended line	
11:07	13:03	Yes	1.93	Production - 2D	ORS01-09 sp 1984-1801 completed.
13:03	15:03	Yes	2.00	Line change	
15:03	15:12	Yes	0.15	Extended line	
15:12	17:15	Yes	2.05	Production - 2D	ORS01-07 sp 1000-1985 completed.
17:15	19:08	Yes	1.88	Line change	
19:08	21:00	Yes	1.87	Production - 2D	ORS01-11 sp 1748-870 completed.

06 June 2001

Start	End	Charge	Hrs	Activity	Details
21:00	23:00	Yes	2.00	Line change	
23:00	23:58	Yes	0.97	Extended line	
23:58	23:59	Yes	0.03	Production - 2D	ORS01-17 sp 1000-1014 continues.
23:59	23:59	Yes	0.00	Production - 2D	Midnight sp 1014

07 June 2001

Start	End	Charge	Hrs	Activity	Details
00:00	02:45	Yes	2.75	Production - 2D	ORS01-17 sp 1015-2331 Completed.
02:45	04:45	Yes	2.00	Line change	
04:45	05:40	Yes	0.92	Extended line	
05:40	07:38	Yes	1.97	Production - 2D	ORS01-18 sp 1802-870 Completed
07:38	09:38	Yes	2.00	Line change	
09:38	09:49	Yes	0.18	Extended line	
09:49	12:26	Yes	2.62	Production - 2D	ORS01-19 sp 1000-2250 Completed.
12:26	14:26	Yes	2.00	Line change	
14:26	15:48	Yes	1.37	Extended line	
15:48	17:46	Yes	1.97	Production - 2D	ORS01-20 sp 1800-870 Completed.
17:46	19:46	Yes	2.00	Line change	
19:46	20:43	Yes	0.95	Extended line	
20:43	22:43	Yes	2.00	Production - 2D	ORS01-16 sp 1801-870 Completed.
22:43	23:59	Yes	1.28	Line change	

08 June 2001

Start	End	Charge	Hrs	Activity	Details
00:00	00:42	Yes	0.70	Line change	
00:42	03:14	Yes	2.53	Weather	ORS01-15 sp 1000-2198 Rejected.due to swell
03:14	06:37	Yes	3.38	Weather	Line turn
06:37	06:47	Yes	0.17	Weather	ORS01-06 sp 1000-1077 Aborted due to swell
06:47	14:41	Yes	7.90	Weather	Steaming north during bad weather.
14:41	17:16	Yes	2.58	Production - 2D	ORS01-15A sp 1000-2198 Completed.
17:16	19:16	Yes	2.00	Line change	
19:16	19:57	Yes	0.68	Extended line	
19:57	22:00	Yes	2.05	Production - 2D	ORS01-06A sp 1000-1984 Completed.
22:00	23:59	Yes	2.00	Line change	

09 June 2001

Start	End	Charge	Hrs	Activity	Details
00:00	01:43	Yes	1.72	Extended line	
01:43	05:15	Yes	3.53	Production - 2D	ORS01-14 sp 2548-1000 completed.
05:15	06:06	Yes	0.85	Mob / Demob	Start recovery of guns.
06:06	06:22	Yes	0.27	Mob / Demob	Helicopter on deck to take off Client Rep.
06:22	07:00	Yes	0.63	Mob / Demob	Recover all guns.
07:00	12:45	Yes	5.75	Mob / Demob	Recover cable.
12:45	23:59	Yes	11.25	Mob / Demob	Transit NW back to Otway/Sorell Basin area.

2. LINE SUMMARY

Production

Date	Seq.	Line		Dir	Type	FSP	FCSP	LCSP	LSP	Charge	No Charge	Status
04/06/01	1	ORS01	03	56	2D	1000	1000	2091	2091	20.4750	0.0000	COMPLETED
04/06/01	2	ORS01	13	217	2D	2707	2707	2033	2022	12.6563	0.2063	Aborted
04/06/01	3	ORS01	13A	217	2D	2163	0	0	2143	0.0000	0.3750	Midnight SP
05/06/01	3	ORS01	13a	217	2D	2144	2032	869	869	21.8250	2.1000	COMPLETED
05/06/01	4	ORS01	12	54	2D	1000	1000	2518	2518	28.4812	0.0000	COMPLETED
05/06/01	5	ORS01	10	233	2D	1828	1828	870	870	17.9812	0.0000	COMPLETED
05/06/01	6	ORS01	08	56	2D	1000	1000	1986	1986	18.5063	0.0000	COMPLETED
05/06/01	7	ORS01	04	236	2D	2014	2014	870	870	21.4688	0.0000	COMPLETED
05/06/01	8	ORS01	02	56	2D	1000	1000	1783	1783	14.7000	0.0000	Midnight SP
06/06/01	8	ORS01	02	56	2D	1784	1784	2144	2144	6.7687	0.0000	COMPLETED
06/06/01	9	ORS01	01	235	2D	1802	1802	870	870	17.4937	0.0000	COMPLETED
06/06/01	10	ORS01	05	55	2D	1000	1000	1984	1984	18.4688	0.0000	COMPLETED
06/06/01	11	ORS01	09	235	2D	1801	1801	870	870	17.4750	0.0000	COMPLETED
06/06/01	12	ORS01	07	56	2D	1000	1000	1985	1985	18.4875	0.0000	COMPLETED
06/06/01	13	ORS01	11	234	2D	1748	1748	870	870	16.4812	0.0000	COMPLETED
06/06/01	14	ORS01	17	56	2D	1000	1000	1014	1014	0.2813	0.0000	Midnight SP
07/06/01	14	ORS01	17	56	2D	1015	1015	2331	2331	24.6938	0.0000	COMPLETED
07/06/01	15	ORS01	18	233	2D	1802	1802	870	870	17.4937	0.0000	COMPLETED
07/06/01	16	ORS01	19	54	2D	1000	1000	2250	2250	23.4563	0.0000	COMPLETED
07/06/01	17	ORS01	20	321	2D	1800	1800	870	870	17.4563	0.0000	COMPLETED
07/06/01	18	ORS01	16	323	2D	1801	1801	870	870	17.4750	0.0000	COMPLETED
08/06/01	19	ORS01	15	145	2D	1000	0	0	2198	0.0000	22.4625	NTBP
08/06/01	20	ORS01	06	24	2D	1000	0	0	1077	0.0000	1.4437	NTBP
08/06/01	21	ORS01	15A	145	2D	1000	1000	2198	2198	22.4812	0.0000	COMPLETED
08/06/01	22	ORS01	06A	24	2D	1000	1000	1984	1984	18.4688	0.0000	COMPLETED
09/06/01	23	ORS01	14	302	2D	2548	2548	870	870	31.4812	0.0000	COMPLETED
									Total Production =	**424.556**	**26.588**	**km**

Total acquisition on this project = 100.37%

3. ENERGY SOURCE DROP OUT SPECIFICATION

- Loss of 10% in peak amplitude is allowed.
- Loss of 10% in primary-bubble radio is allowed.
- Combined loss of peak amplitude and primary- bubble ratio not to exceed 15%.

Please see the lists below.

DROP-OUT SIGNATURE ANALYSIS

Array: ar-a-60-r

CREATED ON 21/07/00 BY G. LU (FUGRO-GEOTEAM AS)

Dropped gun no.	Volumes	P	%ch	P/B	%ch
	Full array	-54.03	0	25.73	0
3-6	40	-52.96	-2	24.37	-5.3
3-5	40	-52.95	-2	24.36	-5.3
1-7	40	-52.87	-2.2	23.73	-7.8
1-8	40	-52.87	-2.2	23.49	-8.7
4-5	70	-52.59	-2.7	21.42	-16.8
4-6	70	-52.58	-2.7	21.33	-17.1
2-3	70	-52.46	-2.9	22.67	-11.9
2-4	70	-52.46	-2.9	22.87	-11.1
2-8	40	-52.42	-3	26.87	4.4
4-8	40	-52.36	-3.1	27.89	8.4
1-5	100	-52.33	-3.2	20.57	-20.1
1-6	100	-52.33	-3.2	20.52	-20.3
3-3	100	-52.26	-3.3	22.77	-11.5
3-4	100	-52.26	-3.3	22.8	-11.4
3-1	150	-52.09	-3.6	22.58	-12.2
3-2	150	-52.09	-3.6	22.51	-12.5
1-1	150	-52.08	-3.6	21.58	-16.2
1-2	150	-52.08	-3.6	21.6	-16.1
3-8	70	-51.99	-3.8	24.77	-3.7
1-9	70	-51.89	-4	25.16	-2.2
2-2	250	-51.87	-4	18.72	-27.2
2-1	250	-51.86	-4	18.53	-28
4-1	250	-51.85	-4	20.22	-21.4
4-2	250	-51.85	-4	20.14	-21.7
1-7 3-6	40 40	-51.79	-4.1	22.45	-12.7
1-8 3-6	40 40	-51.79	-4.1	22.3	-13.4
1-7 3-5	40 40	-51.78	-4.2	22.3	-13.3
1-8 3-5	40 40	-51.78	-4.2	22.28	-13.4
4-7	100	-51.72	-4.3	23.53	-8.6
2-6	100	-51.65	-4.4	23.15	-10
3-6 4-5	40 70	-51.51	-4.7	22.83	-11.3
3-6 4-6	40 70	-51.51	-4.7	22.91	-11
3-5 4-5	40 70	-51.5	-4.7	22.88	-11.1
3-5 4-6	40 70	-51.5	-4.7	22.74	-11.6
1-7 4-5	40 70	-51.42	-4.8	22.57	-12.3
1-7 4-6	40 70	-51.42	-4.8	22.48	-12.6
1-8 4-5	40 70	-51.42	-4.8	22.41	-12.9
1-8 4-6	40 70	-51.42	-4.8	22.19	-13.8
2-4 3-6	70 40	-51.39	-4.9	24.24	-5.8

Dropped gun no.	Volumes	P	%ch	P/B	%ch
2-3 3-6	70 40	-51.38	-4.9	24.16	-6.1
2-4 3-5	70 40	-51.38	-4.9	24.07	-6.4
2-3 3-5	70 40	-51.37	-4.9	24.04	-6.6
3-5 3-6	40 40	-51.35	-5	24.35	-5.4
2-8 3-6	40 40	-51.34	-5	25.19	-2.1
2-8 3-5	40 40	-51.33	-5	25.04	-2.7
1-7 1-8	40 40	-51.32	-5	24.53	-4.7
1-7 2-3	40 70	-51.3	-5.1	23.33	-9.3
1-7 2-4	40 70	-51.3	-5.1	23.42	-9
1-8 2-4	40 70	-51.3	-5.1	23.33	-9.3
1-8 2-3	40 70	-51.29	-5.1	23.28	-9.5
3-5 4-8	40 40	-51.28	-5.1	26.27	2.1
3-6 4-8	40 40	-51.28	-5.1	26.2	1.8
1-5 3-6	100 40	-51.25	-5.1	21.48	-16.5
1-6 3-6	100 40	-51.25	-5.1	21.45	-16.6
1-7 2-8	40 40	-51.25	-5.1	24.47	-4.9
1-8 2-8	40 40	-51.25	-5.1	24.49	-4.8
1-5 3-5	100 40	-51.24	-5.2	21.42	-16.8
1-6 3-5	100 40	-51.24	-5.2	21.45	-16.6
1-7 4-8	40 40	-51.19	-5.3	25.61	-0.5
1-8 4-8	40 40	-51.19	-5.3	25.94	0.8
3-3 3-6	100 40	-51.18	-5.3	23.53	-8.6
3-4 3-6	100 40	-51.18	-5.3	23.3	-9.4
3-3 3-5	100 40	-51.17	-5.3	23.46	-8.8
3-4 3-5	100 40	-51.17	-5.3	23.22	-9.8
1-5 1-8	100 40	-51.13	-5.4	21.28	-17.3
1-6 1-7	100 40	-51.13	-5.4	21.51	-16.4
1-5 1-7	100 40	-51.12	-5.4	21.25	-17.4
1-6 1-8	100 40	-51.12	-5.4	21.29	-17.3
1-7 3-3	40 100	-51.1	-5.4	23.1	-10.2
1-7 3-4	40 100	-51.1	-5.4	23.08	-10.3
1-8 3-3	40 100	-51.1	-5.4	23.04	-10.5
1-8 3-4	40 100	-51.1	-5.4	23.01	-10.6
2-4 4-5	70 70	-51.02	-5.6	17.36	-32.5
3-1 3-6	150 40	-51.02	-5.6	22.33	-13.2
3-2 3-6	150 40	-51.02	-5.6	22.1	-14.1
1-1 3-6	150 40	-51.01	-5.6	21.44	-16.7
1-2 3-6	150 40	-51.01	-5.6	21.49	-16.5
2-3 4-5	70 70	-51.01	-5.6	17.43	-32.3
2-3 4-6	70 70	-51.01	-5.6	17.44	-32.2
2-4 4-6	70 70	-51.01	-5.6	17.37	-32.5
3-1 3-5	150 40	-51.01	-5.6	22.13	-14
3-2 3-5	150 40	-51.01	-5.6	22.16	-13.9
1-1 3-5	150 40	-51	-5.6	21.5	-16.4
1-2 3-5	150 40	-51	-5.6	21.36	-17
2-8 4-5	40 70	-50.97	-5.7	20.86	-18.9
2-8 4-6	40 70	-50.97	-5.7	20.9	-18.8
1-7 3-1	40 150	-50.93	-5.7	21.83	-15.2
1-7 3-2	40 150	-50.93	-5.7	21.81	-15.3
1-8 3-1	40 150	-50.93	-5.7	21.81	-15.3
1-8 3-2	40 150	-50.93	-5.7	21.71	-15.6

Dropped gun no.	Volumes	P	%ch	P/B	%ch
1-1 1-7	150 40	-50.92	-5.8	20.64	-19.8
1-1 1-8	150 40	-50.92	-5.8	20.67	-19.7
1-2 1-7	150 40	-50.92	-5.8	20.65	-19.8
1-2 1-8	150 40	-50.92	-5.8	20.64	-19.8
4-5 4-8	70 40	-50.91	-5.8	20.74	-19.4
4-6 4-8	70 40	-50.91	-5.8	20.95	-18.6
1-5 4-5	100 70	-50.88	-5.8	16.54	-35.7
1-5 4-6	100 70	-50.88	-5.8	16.54	-35.7
1-6 4-5	100 70	-50.88	-5.8	16.51	-35.8
1-6 4-6	100 70	-50.88	-5.8	16.39	-36.3
3-5 3-8	40 70	-50.86	-5.9	22.06	-14.3
3-6 3-8	40 70	-50.86	-5.9	22.07	-14.2
2-3 2-8	70 40	-50.85	-5.9	23.07	-10.4
2-4 2-8	70 40	-50.85	-5.9	23.29	-9.5
1-7 3-8	40 70	-50.82	-5.9	22.91	-11
1-8 3-8	40 70	-50.82	-5.9	22.72	-11.7
1-9 3-6	70 40	-50.82	-6	23.68	-8
3-3 4-5	100 70	-50.82	-5.9	18.67	-27.4
3-3 4-6	100 70	-50.82	-6	18.69	-27.4
3-4 4-5	100 70	-50.82	-6	18.54	-27.9
1-9 3-5	70 40	-50.81	-6	23.68	-8
3-4 4-6	100 70	-50.81	-6	18.74	-27.2
2-1 3-6	250 40	-50.79	-6	18	-30.1
2-2 3-6	250 40	-50.79	-6	18.06	-29.8
2-3 4-8	70 40	-50.79	-6	22.62	-12.1
2-4 4-8	70 40	-50.79	-6	22.42	-12.9
2-1 3-5	250 40	-50.78	-6	17.94	-30.3
2-2 3-5	250 40	-50.78	-6	18.25	-29.1
3-6 4-1	40 250	-50.78	-6	19.27	-25.1
3-6 4-2	40 250	-50.78	-6	19.16	-25.5
3-5 4-1	40 250	-50.77	-6	19.26	-25.2
3-5 4-2	40 250	-50.77	-6	19.35	-24.8
1-5 2-4	100 70	-50.76	-6.1	16.96	-34.1
1-6 2-4	100 70	-50.76	-6.1	16.89	-34.4
1-5 2-3	100 70	-50.75	-6.1	16.92	-34.3
1-6 2-3	100 70	-50.75	-6.1	16.88	-34.4
2-8 4-8	40 40	-50.75	-6.1	25.32	-1.6
1-7 1-9	40 70	-50.72	-6.1	22.22	-13.7
1-8 1-9	40 70	-50.72	-6.1	22.24	-13.6
1-5 2-8	100 40	-50.71	-6.1	20.35	-20.9
1-6 2-8	100 40	-50.71	-6.1	20.27	-21.2
1-7 2-1	40 250	-50.7	-6.2	17.63	-31.5
1-7 2-2	40 250	-50.7	-6.2	17.68	-31.3
1-8 2-1	40 250	-50.7	-6.2	17.48	-32.1
1-8 2-2	40 250	-50.7	-6.2	17.59	-31.6
1-7 4-1	40 250	-50.69	-6.2	18.98	-26.2
1-7 4-2	40 250	-50.69	-6.2	18.81	-26.9
1-8 4-1	40 250	-50.69	-6.2	18.94	-26.4
1-8 4-2	40 250	-50.69	-6.2	18.67	-27.4
2-3 3-3	70 100	-50.69	-6.2	19.09	-25.8
2-3 3-4	70 100	-50.69	-6.2	19.41	-24.6

Dropped gun no.	Volumes	P	%ch	P/B	%ch
2-4 3-3	70 100	-50.69	-6.2	19.2	-25.4
2-4 3-4	70 100	-50.69	-6.2	19.11	-25.7
1-5 4-8	100 40	-50.65	-6.3	19.97	-22.4
1-6 4-8	100 40	-50.65	-6.3	19.9	-22.7
2-8 3-3	40 100	-50.65	-6.3	22.78	-11.5
2-8 3-4	40 100	-50.65	-6.3	22.99	-10.7
3-1 4-5	150 70	-50.65	-6.3	21.32	-17.2
3-1 4-6	150 70	-50.65	-6.3	21.08	-18.1
3-2 4-5	150 70	-50.65	-6.3	21.14	-17.9
3-2 4-6	150 70	-50.65	-6.3	21.26	-17.4
1-1 4-5	150 70	-50.64	-6.3	21.75	-15.5
1-2 4-5	150 70	-50.64	-6.3	21.76	-15.4
1-2 4-6	150 70	-50.64	-6.3	21.79	-15.3
3-5 4-7	40 100	-50.64	-6.3	22.31	-13.3
3-6 4-7	40 100	-50.64	-6.3	22.32	-13.3
1-1 4-6	150 70	-50.63	-6.3	21.82	-15.2
3-3 4-8	100 40	-50.59	-6.4	22.73	-11.7
3-4 4-8	100 40	-50.59	-6.4	22.61	-12.1
2-6 3-6	100 40	-50.58	-6.4	21.91	-14.9
1-5 3-3	100 100	-50.56	-6.4	17.35	-32.6
1-5 3-4	100 100	-50.56	-6.4	17.26	-32.9
1-6 3-3	100 100	-50.56	-6.4	17.36	-32.6
1-6 3-4	100 100	-50.56	-6.4	17.39	-32.4
2-6 3-5	100 40	-50.56	-6.4	21.96	-14.7
1-7 4-7	40 100	-50.55	-6.4	21.72	-15.6
1-8 4-7	40 100	-50.55	-6.4	21.63	-16
3-8 4-5	70 70	-50.54	-6.5	22.79	-11.4
3-8 4-6	70 70	-50.54	-6.5	22.82	-11.3
1-2 2-4	150 70	-50.52	-6.5	22.45	-12.8
2-3 3-1	70 150	-50.52	-6.5	22.86	-11.2
2-3 3-2	70 150	-50.52	-6.5	22.89	-11.1
2-4 3-1	70 150	-50.52	-6.5	22.99	-10.7
2-4 3-2	70 150	-50.52	-6.5	23.01	-10.6
1-1 2-3	150 70	-50.51	-6.5	22.65	-12
1-1 2-4	150 70	-50.51	-6.5	22.58	-12.3
1-2 2-3	150 70	-50.51	-6.5	22.39	-13
4-5 4-6	70 70	-50.51	-6.5	22.47	-12.7
1-7 2-6	40 100	-50.49	-6.6	21.33	-17.1
1-8 2-6	40 100	-50.49	-6.6	21.18	-17.7
2-8 3-1	40 150	-50.48	-6.6	22.48	-12.6
2-8 3-2	40 150	-50.48	-6.6	22.36	-13.1
1-1 2-8	150 40	-50.47	-6.6	21.49	-16.5
1-2 2-8	150 40	-50.47	-6.6	21.43	-16.7
1-9 4-5	70 70	-50.45	-6.6	22.93	-10.9
1-9 4-6	70 70	-50.44	-6.6	22.71	-11.7
2-1 4-5	250 70	-50.42	-6.7	18.66	-27.5
2-1 4-6	250 70	-50.42	-6.7	18.46	-28.3
2-2 4-5	250 70	-50.42	-6.7	18.77	-27.1
2-2 4-6	250 70	-50.42	-6.7	18.59	-27.7
2-3 3-8	70 70	-50.42	-6.7	24.24	-5.8
2-4 3-8	70 70	-50.42	-6.7	24.32	-5.5

Dropped gun no.	Volumes	P	%ch	P/B	%ch
3-1 4-8	150 40	-50.42	-6.7	22.67	-11.9
3-2 4-8	150 40	-50.42	-6.7	22.51	-12.5
1-1 4-8	150 40	-50.41	-6.7	21.5	-16.5
1-2 4-8	150 40	-50.41	-6.7	21.53	-16.3
4-1 4-5	250 70	-50.41	-6.7	20.14	-21.7
4-1 4-6	250 70	-50.41	-6.7	20.23	-21.4
4-2 4-5	250 70	-50.41	-6.7	20.14	-21.7
4-2 4-6	250 70	-50.4	-6.7	20.11	-21.9
1-5 3-1	100 150	-50.39	-6.7	20.66	-19.7
1-5 3-2	100 150	-50.39	-6.7	20.73	-19.4
1-6 3-1	100 150	-50.39	-6.7	20.65	-19.7
1-6 3-2	100 150	-50.39	-6.7	20.63	-19.8
1-1 1-5	150 100	-50.38	-6.8	18.47	-28.2
1-1 1-6	150 100	-50.38	-6.8	18.34	-28.7
1-2 1-5	150 100	-50.38	-6.8	18.12	-29.6
1-2 1-6	150 100	-50.38	-6.8	18.2	-29.3
2-8 3-8	40 70	-50.37	-6.8	25.81	0.3
1-2 3-3	150 100	-50.32	-6.9	18.1	-29.7
1-9 2-3	70 70	-50.32	-6.9	24.12	-6.3
1-9 2-4	70 70	-50.32	-6.9	24.4	-5.2
3-1 3-3	150 100	-50.32	-6.9	18.35	-28.7
3-1 3-4	150 100	-50.32	-6.9	18.4	-28.5
3-2 3-3	150 100	-50.32	-6.9	18.34	-28.7
1-1 3-3	150 100	-50.31	-6.9	18.29	-28.9
1-1 3-4	150 100	-50.31	-6.9	18.17	-29.4
1-2 3-4	150 100	-50.31	-6.9	18.07	-29.8
3-2 3-4	150 100	-50.31	-6.9	18.43	-28.4
3-8 4-8	70 40	-50.31	-6.9	27.37	6.4
2-3 2-4	70 70	-50.3	-6.9	23.55	-8.5
2-1 2-4	250 70	-50.29	-6.9	19.91	-22.6
2-2 2-3	250 70	-50.29	-6.9	19.49	-24.3
2-2 2-4	250 70	-50.29	-6.9	19.54	-24.1
2-4 4-1	70 250	-50.29	-6.9	20.08	-22
1-5 3-8	100 70	-50.28	-6.9	21.35	-17
1-6 3-8	100 70	-50.28	-6.9	21.35	-17
1-9 2-8	70 40	-50.28	-6.9	26.27	2.1
2-1 2-3	250 70	-50.28	-6.9	19.47	-24.3
2-3 4-1	70 250	-50.28	-6.9	19.97	-22.4
2-3 4-2	70 250	-50.28	-6.9	20.01	-22.2
2-4 4-2	70 250	-50.28	-6.9	19.88	-22.7
2-1 2-8	250 40	-50.25	-7	19.36	-24.8
2-2 2-8	250 40	-50.25	-7	19.3	-25
2-8 4-1	40 250	-50.24	-7	20.61	-19.9
2-8 4-2	40 250	-50.24	-7	20.88	-18.9
1-9 4-8	70 40	-50.22	-7.1	27.67	7.5
3-3 3-8	100 70	-50.22	-7.1	23.77	-7.6
3-4 3-8	100 70	-50.22	-7.1	23.73	-7.8
4-5 4-7	70 100	-50.22	-7.1	22.87	-11.1
2-6 4-5	100 70	-50.21	-7.1	20.92	-18.7
4-6 4-7	70 100	-50.21	-7.1	23.09	-10.3
2-6 4-6	100 70	-50.2	-7.1	20.94	-18.6

Dropped gun no.	Volumes	P	%ch	P/B	%ch
1-5 1-9	100 70	-50.19	-7.1	21.61	-16
1-6 1-9	100 70	-50.19	-7.1	21.47	-16.6
2-1 4-8	250 40	-50.19	-7.1	19.74	-23.3
2-2 4-8	250 40	-50.19	-7.1	19.51	-24.2
4-1 4-8	250 40	-50.18	-7.1	21.38	-16.9
4-2 4-8	250 40	-50.18	-7.1	21.62	-16
1-5 2-1	100 250	-50.16	-7.2	19.46	-24.4
1-5 2-2	100 250	-50.16	-7.2	19.42	-24.5
1-6 2-1	100 250	-50.16	-7.2	19.2	-25.4
1-6 2-2	100 250	-50.16	-7.2	19.47	-24.4
1-2 3-1	150 150	-50.15	-7.2	17.72	-31.2
1-2 3-2	150 150	-50.15	-7.2	17.71	-31.2
1-5 4-1	100 250	-50.15	-7.2	20.2	-21.5
1-5 4-2	100 250	-50.15	-7.2	20.19	-21.6
1-6 4-1	100 250	-50.15	-7.2	20.19	-21.6
1-6 4-2	100 250	-50.15	-7.2	20.11	-21.9
2-3 4-7	70 100	-50.15	-7.2	23.29	-9.5
2-4 4-7	70 100	-50.15	-7.2	23.28	-9.5
1-1 3-1	150 150	-50.14	-7.2	17.81	-30.8
1-1 3-2	150 150	-50.14	-7.2	17.68	-31.3
1-9 3-3	70 100	-50.12	-7.2	23.42	-9
1-9 3-4	70 100	-50.12	-7.2	23.45	-8.9
2-8 4-7	40 100	-50.11	-7.3	24.31	-5.5
2-1 3-3	250 100	-50.1	-7.3	18.54	-27.9
2-1 3-4	250 100	-50.1	-7.3	18.85	-26.7
2-2 3-4	250 100	-50.1	-7.3	18.58	-27.8
2-2 3-3	250 100	-50.09	-7.3	18.82	-26.9
3-3 4-1	100 250	-50.09	-7.3	20.41	-20.7
3-3 4-2	100 250	-50.09	-7.3	20.48	-20.4
3-4 4-2	100 250	-50.09	-7.3	20.16	-21.7
3-4 4-1	100 250	-50.08	-7.3	20.35	-20.9
2-3 2-6	70 100	-50.07	-7.3	22.7	-11.8
2-4 2-6	70 100	-50.07	-7.3	22.81	-11.4
3-1 3-8	150 70	-50.05	-7.4	21.97	-14.6
3-2 3-8	150 70	-50.05	-7.4	21.93	-14.8
1-1 3-8	150 70	-50.04	-7.4	21.41	-16.8
1-2 3-8	150 70	-50.04	-7.4	21.28	-17.3
4-7 4-8	100 40	-50.03	-7.4	26.83	4.3
1-5 4-7	100 100	-50.01	-7.4	21.56	-16.2
1-6 4-7	100 100	-50.01	-7.4	21.46	-16.6
1-5 1-6	100 100	-49.99	-7.5	25.34	-1.5
2-6 4-8	100 40	-49.98	-7.5	25.35	-1.5
1-5 2-6	100 100	-49.95	-7.6	22.03	-14.4
1-6 2-6	100 100	-49.95	-7.6	21.92	-14.8
1-9 3-1	70 150	-49.95	-7.5	21.93	-14.8
1-9 3-2	70 150	-49.95	-7.5	21.9	-14.9
2-6 2-8	100 40	-49.95	-7.5	25.56	-0.7
3-3 4-7	100 100	-49.95	-7.6	23.55	-8.5
3-4 4-7	100 100	-49.95	-7.6	23.49	-8.7
1-1 1-9	150 70	-49.94	-7.6	21.17	-17.7
1-2 1-9	150 70	-49.94	-7.6	21.08	-18.1

Dropped gun no.	Volumes	P	%ch	P/B	%ch
2-1 3-1	250 150	-49.93	-7.6	18.31	-28.9
2-1 3-2	250 150	-49.93	-7.6	18.12	-29.6
2-2 3-1	250 150	-49.93	-7.6	18.41	-28.5
2-2 3-2	250 150	-49.93	-7.6	18.43	-28.4
1-1 2-2	150 250	-49.92	-7.6	20.58	-20
1-2 2-2	150 250	-49.92	-7.6	20.89	-18.8
3-1 4-1	150 250	-49.92	-7.6	19.23	-25.3
3-1 4-2	150 250	-49.92	-7.6	19.04	-26
3-2 4-2	150 250	-49.92	-7.6	18.99	-26.2
1-1 2-1	150 250	-49.91	-7.6	20.8	-19.2
1-2 2-1	150 250	-49.91	-7.6	20.75	-19.4
1-2 4-1	150 250	-49.91	-7.6	21.76	-15.4
1-2 4-2	150 250	-49.91	-7.6	21.79	-15.3
3-2 4-1	150 250	-49.91	-7.6	19.14	-25.6
1-1 4-1	150 250	-49.9	-7.6	21.74	-15.5
1-1 4-2	150 250	-49.9	-7.6	21.98	-14.6
2-6 3-3	100 100	-49.88	-7.7	23.83	-7.4
2-6 3-4	100 100	-49.88	-7.7	23.79	-7.5
1-9 3-8	70 70	-49.85	-7.7	24.19	-6
2-1 3-8	250 70	-49.82	-7.8	17.92	-30.4
2-2 3-8	250 70	-49.82	-7.8	18.07	-29.8
3-3 3-4	100 100	-49.81	-7.8	25.04	-2.7
3-8 4-1	70 250	-49.81	-7.8	19.53	-24.1
3-8 4-2	70 250	-49.81	-7.8	19.55	-24
3-1 4-7	150 100	-49.78	-7.9	22.39	-13
3-2 4-7	150 100	-49.78	-7.9	22.5	-12.6
1-1 4-7	150 100	-49.77	-7.9	22.96	-10.8
1-2 4-7	150 100	-49.77	-7.9	22.8	-11.4
1-9 2-2	70 250	-49.73	-8	18.32	-28.8
1-9 2-1	70 250	-49.72	-8	18.2	-29.3
1-9 4-1	70 250	-49.72	-8	19.71	-23.4
2-6 3-1	100 150	-49.72	-8	22.17	-13.8
1-2 2-6	150 100	-49.71	-8	21.45	-16.6
1-9 4-2	70 250	-49.71	-8	19.66	-23.6
2-6 3-2	100 150	-49.71	-8	22.11	-14.1
1-1 2-6	150 100	-49.7	-8	21.65	-15.9
2-1 4-1	250 250	-49.69	-8	14.67	-43
2-1 4-2	250 250	-49.69	-8	14.51	-43.6
2-2 4-1	250 250	-49.69	-8	14.65	-43.1
2-2 4-2	250 250	-49.69	-8	14.9	-42.1
3-8 4-7	70 100	-49.67	-8.1	22.64	-12
2-6 3-8	100 70	-49.61	-8.2	22.25	-13.5
1-9 4-7	70 100	-49.58	-8.2	22.81	-11.4
2-1 4-7	250 100	-49.55	-8.3	17.59	-31.7
2-2 4-7	250 100	-49.55	-8.3	17.71	-31.2
4-1 4-7	250 100	-49.54	-8.3	18.68	-27.4
4-2 4-7	250 100	-49.54	-8.3	19.06	-25.9
1-9 2-6	70 100	-49.52	-8.4	22.52	-12.5
2-1 2-6	250 100	-49.48	-8.4	17.44	-32.2
2-2 2-6	250 100	-49.48	-8.4	17.66	-31.4
2-6 4-1	100 250	-49.48	-8.4	18.46	-28.3

Dropped gun no.	Volumes	P	%ch	P/B	%ch
2-6 4-2	100 250	-49.47	-8.4	18.59	-27.7
3-1 3-2	150 150	-49.36	-8.6	23.99	-6.8
1-1 1-2	150 150	-49.34	-8.7	25.04	-2.7
2-6 4-7	100 100	-49.34	-8.7	21.28	-17.3
2-1 2-2	250 250	-48.57	-10.1	21.69	-15.7
4-1 4-2	250 250	-48.55	-10.2	22.65	-12

4. WEATHER REPORTS

Date	Time	WIND Speed - m/s	WIND Direction - Degs	SEA State Code	PRESSURE mBar
04-Jun-01	06:00	6	0	2	1025
	12:00	6	0	2	1024
	18:00	7	330	2	1026
	24:00	7	0	3	1026
05-Jun-01	06:00	6	0	2	1023
	12:00	6	35	2	1024
	18:00	5	280	2	1021
	24:00	6	0	1	1021
06-Jun-01	06:00	5	20	2	1020
	12:00	5	110	3	1019
	18:00	6	100	2	1016
	24:00	10	3	4	1016
07-Jun-01	06:00	6	50	3	1012
	12:00	7	90	3	1011
	18:00	10	0	3	1010
	24:00	12	350	3	1010
08-Jun-01	06:00	16	340	5	1007
	12:00	12	300	4	1009
	18:00	5	290	3	1010
	24:00	5	280	4	1010
09-Jun-01	06:00	6	Var	2	1015
	12:00	16	90	6	1020
	18:00	13	100	5	1021
	24:00	14	90	5	1021

5. SAFETY ACCIDENTS / NEAR MISS REPORTS

N/A

6. NAV QC LOG

GEOTEAM

FUGRO

NAVIGATION QC LOG

CLIENT:	Seismic Australia	VESSEL:	RV Geo Arctic	NAV. SYSTEM 1:	Starfix Spot
PROJECT:	2D survey	AREA:	Shelduck T/18P Bass Basin Tasmania	NAV. SYSTEM 2:	Starfix MN8
NAV PROG.:	Starfix Suite 3.1	PROJECT NO.:	34834	REF. STATS:	385,336,326,275,026,022,026

Line Number	Sequence	Cross Course				Shot Point Interval				Satellites	PDOP			Fthr<°		Speed	Comments
ORS01-		Min	Max	Mean	SD	Min	Max	Mean	SD	Mean	Max	Mean	SD	Min	Max	Mean	
03	001	-4.47	4.91	0.17	1.53	18.61	18.88	18.75	0.02	9	4.8	2.7	1.1	-2.9	-2.3	4.67	Complete
13	002	-4.20	-	-	-	-	-	-	-	6.8	3.2	2.4	0.3	-2.5	-0.1	4.76	Incomplete, Starfix hangup with sps at dogleg
13A	003	-4.35	4.00	0.05	1.70	18.65	18.84	18.75	0.02	8.3	2.8	2.0	0.4	-0.8	1.4	4.78	Complete
12	004	-4.71	5.16	-0.62	1.64	18.61	18.88	18.75	0.03	6.1	5.8	2.9	1.0	0.1	3.2	4.83	Complete
10	005	-3.55	4.19	0.45	1.48	18.61	18.83	18.75	0.02	8.1	2.8	2.1	0.3	-3.4	0.6	4.84	Complete
08	006	-3.78	3.88	-0.01	1.71	18.59	18.96	18.75	0.03	9.0	4.8	2.9	1.1	-2.5	2.3	4.79	Complete
04	007	-3.17	5.08	-0.52	1.27	18.65	18.83	18.75	0.02	6.7	3.4	2.7	0.4	-3.7	1.2	4.77	Complete
02	008	-4.50	4.17	-0.45	1.50	18.58	18.91	18.75	0.03	8	3.0	2.2	0.5	1.2	11.6	4.73	Complete
01	009	-3.59	5.38	0.03	2.03	18.65	18.84	18.75	0.02	7.5	2.7	2.1	0.4	-2.4	0.6	4.83	Complete
05	010	-2.81	2.38	-0.11	0.92	18.63	18.86	18.75	0.02	6.2	4.3	2.9	0.4	-1.8	2.4	4.77	Complete
09	011	-3.11	6.62	0.06	1.61	18.65	18.82	18.75	0.02	8.5	3.3	2.0	0.3	-2.3	-0.6	4.87	Complete
07	012	-3.73	6.66	0.70	1.99	18.65	18.84	18.75	0.02	9	2.8	2.3	0.3	-2.2	-0.5	4.88	Complete
11	013	-2.64	1.94	-0.09	0.89	18.69	18.80	18.75	0.01	6.7	3.4	2.5	0.4	-0.5	5.2	4.77	Complete
17	014	-4.96	4.75	0.22	1.89	18.62	18.88	18.75	0.02	8.2	2.8	2.1	0.4	1.1	4.9	4.84	Complete
18	015	-5.96	5.81	-0.09	2.05	18.69	18.79	18.75	0.01	6.1	5.7	3.1	1.0	-2.8	-0.8	4.83	Complete
19	016	-7.77	5.87	-0.29	1.98	18.68	18.83	18.75	0.01	7.7	3.1	2.3	0.3	-1.2	4.7	4.82	Complete
20	017	-4.63	5.40	0.79	1.91	18.70	18.78	18.75	0.01	9	3.1	2.2	0.4	-3.1	-0.4	4.80	Complete
16	018	-5.60	6.11	0.06	1.94	18.61	18.86	18.75	0.02	6.8	3.4	2.2	0.6	-3.3	0.5	4.73	Complete
15	019	-8.17	8.00	0.86	2.97	18.63	18.87	18.75	0.01	8.3	3.0	2.0	1.5	-5.6	-1.4	4.80	Scratched d/t Streamer noise
06	020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Line aborted data scratched d/t swell noise
15A	021	-6.79	6.59	0.39	2.76	18.68	18.82	18.75	0.01	9	4.8	2.2	0.3	-2.8	2.6	4.71	Complete
06A	022	-6.17	6.15	-0.15	2.42	18.67	18.86	18.75	0.02	6.6	3.5	2.5	0.5	-0.6	1.6	4.83	Complete
14	023	-6.00	5.56	0.17	2.19	18.67	18.82	18.75	0.01	7.1	2.8	2.2	0.4	-2.1	2.0	4.81	Complete

7. PRODUCTION LOG

VESSEL DAILY REPORT

r/v Geo Arctic **04 June 2001**

Project Number : 34834Report Number : 1

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

To: F-GAS AS, Oslo. Atten : D.Nolan, H.C. Vagge, D.S. Stensholt, J. Helgebostad. MAROPS

To: Jenny Bauer, Manager Offshore Exploration

Lines acquired today on this Project :-

Seq.	Line	Dir	Type	FSP	FCSP	LCSP	LSP	Chargeable	Non Chargeable	Status
1	ORS01 03	56	2D	1000	1000	2091	2091	20.475	0.000	COMPLETED
2	ORS01 13	217	2D	2707	2707	2033	2022	12.656	0.206	Aborted
3	ORS01 13A	217	2D	2163	0	0	2143	0.000	0.375	Midnight SP
						Production total for today =		**33.131**	**0.581**	**km**
						Total acquisition on this project =		**7.83%**	**33.131**	**0.581** **km**

Daily timings :- All report times in UTC, the local time zone is UTC + 10 hours

Start	End	Chargeable	Hrs	Activity	Details
00:00	07:00	Yes	7.00	Mob / Demob	Transit to cable deployment area
07:00	11:45	Yes	4.75	Mob / Demob	Deploy 4..7km cable and trim balance.
11:45	12:29	Yes	0.73	Mob / Demob	Deploy guns.
12:29	14:02	Yes	1.55	Mob / Demob	Approach first line and soft start guns.
14:02	16:23	Yes	2.35	Production - 2D	ORS01-03 sp 1000-2091 completed.
16:23	18:23	Yes	2.00	Line change	
18:23	18:36	Yes	0.22	Extended line change	
18:36	20:02	Yes	1.43	Production - 2D	ORS01-13 sp 2707-2033 aborted
20:02	23:57	No	3.92	Navigation	Circle due to navigation crash
23:57	23:59	No	0.05	Navigation	ORS01-13A 2163-2143 overlap

Hours today = 24.00

Timing analysis :-

Chargeable :-	**Today's Hours**	**Accumulated Hours**	
Extended line change	0.22	0.22	0.90%
Line change	2.00	2.00	8.33%
Mob / Demob	14.03	14.03	58.47%
Production - 2D	3.78	3.78	15.76%

Total =	**20.03**	**20.03**	**83.47%**

Non Chargeable :-	**Today's Hours**	**Accumulated Hours**	
Navigation	3.97	3.97	16.53%
Total =	**3.97**	**3.97**	**16.53%**

VESSEL DAILY REPORT

r/v Geo Arctic **04 June 2001**

Project Number : 34834Report Number : 1

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

Total time at sea on this Project = **24.00** hours or **1.00** days

WEATHER :

	Winds		Press.	Sea state	Weather forecast
	m/s	degr's	mBar	code	(Beaufort scale)
06:00	6	0	1025	2	**Tomorrow** NW3, swell 1m wsw
12:00	6	0	1024	2	**Day After** WSW 3, swell 1m SE
18:00	7	330	1026	2	**Out Look** 7th ENE 7 with 4m seas
24:00	7	0	1024	3	

PERSONNEL : 50 Persons on board the vessel today

SAFETY : No incidents to report.
No whale sightings to report.

INTENTIONS FOR NEXT 24 HRS : Complete line ORS01-13A then go to line ORS01-12

QC PROCESSSING : First two lines still being stacked and tested

PARTY CHIEF'S COMMENTS : Project started in flat calm seas and little wind. All data shot today with 3.5ub of cable noise or less. Line ORS01-03 shot without problem.

Line ORS01-13 the longest line and with a priority well tie was aborted with a navigation failure right at the well location which had been entered as a dog leg way point . The navigation program had a difficulty moving through this dog leg with a decrimenting shot point count as required. The vessel circled and re-stared the line with a suitable run-in and overlap to complete the line without further problem.

No fishing activity, seismic interference or shipping traffic were encountered.

CLIENT REP. COMMENTS : No additional comments..

Signed :-

Party Chief: John Carrey **Client Representative:** Rodney Waldon

GEOTEAM

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VESSEL DAILY REPORT

r/v Geo Arctic **05 June 2001**

Project Number : 34834Report Number : 2

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

To: F-GAS AS, Oslo. Atten : D.Nolan, H.C. Vagge, D.S. Stensholt, J. Helgebostad. MAROPS

To: Jenny Bauer, Manager Offshore Exploration

Lines acquired today on this Project :-

Seq.	Line	Dir	Type	FSP	FCSP	LCSP	LSP	Chargeable	Non Chargeable	Status
3	ORS01 13a	217	2D	2144	2032	869	869	21.825	2.100	COMPLETED
4	ORS01 12	54	2D	1000	1000	2518	2518	28.481	0.000	COMPLETED
5	ORS01 10	233	2D	1828	1828	870	870	17.981	0.000	COMPLETED
6	ORS01 08	56	2D	1000	1000	1986	1986	18.506	0.000	COMPLETED
7	ORS01 04	236	2D	2014	2014	870	870	21.469	0.000	COMPLETED
8	ORS01 02	56	2D	1000	1000	1783	1783	14.700	0.000	Midnight SP

Production total for today = 122.962 2.100 km

Total acquisition on this project = 36.90% 156.094 2.681 km

Daily timings :- All report times in UTC, the local time zone is UTC + 10 hours

Start	End	Chargeable	Hrs	Activity	Details
00:00	00:14	No	0.23	Navigation	ORS01-13A sp 2142-2033 Overlap
00:14	02:41	Yes	2.45	Production - 2D	ORS01-13A sp 2032-869 Completed.
02:41	04:41	Yes	2.00	Line change	Nominal line turn
04:41	05:13	Yes	0.53	Extended line change	
05:13	08:24	Yes	3.18	Production - 2D	ORS01-12 sp1000-2518 Completed
08:24	10:24	Yes	2.00	Line change	
10:24	10:43	Yes	0.32	Extended line change	
10:43	12:43	Yes	2.00	Production - 2D	ORS01-10 sp1828-870 Completed.
12:43	14:36	Yes	1.88	Line change	
14:36	16:41	Yes	2.08	Production - 2D	ORS01-08 sp1000-1986 Completed.
16:41	18:12	Yes	1.52	Line change	
18:12	20:38	Yes	2.43	Production - 2D	ORS01-04 sp2014-870 Completed.
20:38	22:19	Yes	1.68	Line change	
22:19	23:59	Yes	1.68	Production - 2D	ORS01-02 sp 1000-1783 continues.
23:59	23:59	Yes	0.00	Production - 2D	Midnight sp 1783

Hours today = 24.00

Timing analysis :-

Chargeable :- **Today's Hours** **Accumulated Hours**

Extended line change	0.85	1.07	2.22%
Line change	9.08	11.08	23.09%
Mob / Demob	0.00	14.03	29.24%
Production - 2D	13.83	17.62	36.70%
Total =	**23.77**	**43.80**	**91.25%**

r/v Geo Arctic **05 June 2001**

Project Number : 34834Report Number : 2

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

Non Chargeable :-	**Today's Hours**	**Accumulated Hours**	
Navigation	0.23	4.20	8.75%
Total =	**0.23**	**4.20**	**8.75%**

Total time at sea on this Project = **48.00** hours or **2.00** days

WEATHER :

	Winds		**Press.**	**Sea state**
	m/s	**degr's**	**mBar**	**code**
06:00	6	0	1023	2
12:00	6	35	1024	2
18:00	5	280	1021	2
24:00	6	0	1021	1

Weather forecast (Beaufort scale)

Tomorrow SSE 3-4, swell WSW 2m

Day After E6, swell E3m

Out Look Uncertain

PERSONNEL : 50 Persons on board the vessel today

SAFETY : No incidents to report.
No whale sightings reported

INTENTIONS FOR NEXT 24 HRS : Continued production

PROCESSING : Testing for incrementing SP lines completed. Still underway for decrementing SP lines. Client has revised noise allowances to be 10 microbars average, with 20 microbars being allowed on the first 12 groups, the last 6 groups nearest the tailbuoy, and at bird locations. Line 03: Stack produced. Noise levels good. Average noise level for line is 3.79 microbars (SOL = 3.22, EOL = 3.44, from noise files). One noisy channel.

PARTY CHIEF'S COMMENTS : Low noise, high quality production continues throughout the day. A few passing ferry boats give a wide berth, no fishing boats seen. Fish representatives ashore are kept informed of our position.
There has been some discussion about whether the contract includes a nominal line term clause. I have identifed all line turns of two hours or less as “Line turn” and turns greater than two hours as extended turns due to the shape of the prospect. How this time is charged can be decided by the two offices at a later date.

CLIENT REP. COMMENTS : No additional comments..

Signed :-

Party Chief: John Carrey **Client Representative:** Rodney Waldon

GEOTEAM

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VESSEL DAILY REPORT

r/v Geo Arctic **06 June 2001**

Project Number : 34834Report Number : 3

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

To: F-GAS AS, Oslo. Atten : D.Nolan, H.C. Vagge, D.S. Stensholt, J. Helgebostad. MAROPS

To: Jenny Bauer, Manager Offshore Exploration

Lines acquired today on this Project :-

Seq.	Line	Dir	Type	FSP	FCSP	LCSP	LSP	Chargeable	Non Chargeable	Status
8	ORS01 02	56	2D	1784	1784	2144	2144	6.769	0.000	COMPLETED
9	ORS01 01	235	2D	1802	1802	870	870	17.494	0.000	COMPLETED
10	ORS01 05	55	2D	1000	1000	1984	1984	18.469	0.000	COMPLETED
11	ORS01 09	235	2D	1801	1801	870	870	17.475	0.000	COMPLETED
12	ORS01 07	56	2D	1000	1000	1985	1985	18.488	0.000	COMPLETED
13	ORS01 11	234	2D	1748	1748	870	870	16.481	0.000	COMPLETED
14	ORS01 17	56	2D	1000	1000	1014	1014	0.281	0.000	Midnight SP

Production total for today = 95.456 0.000 km

Total acquisition on this project = 59.47% 251.550 2.681 km

Daily timings :- All report times in UTC, the local time zone is UTC + 10 hours

Start	End	Chargeable	Hrs	Activity	Details
00:00	00:46	Yes	0.77	Production - 2D	ORS01-02 sp 1784-2144 completed.
00:46	02:21	Yes	1.58	Line change	
02:21	04:18	Yes	1.95	Production - 2D	ORS01-01 sp 1802-870 completed.
04:18	06:18	Yes	2.00	Line change	
06:18	06:33	Yes	0.25	Extended line change	
06:33	08:39	Yes	2.10	Production - 2D	ORS01-05 sp 1000-1984 completed.
08:39	10:39	Yes	2.00	Line change	
10:39	11:07	Yes	0.47	Extended line change	
11:07	13:03	Yes	1.93	Production - 2D	ORS01-09 sp 1984-1801 completed.
13:03	15:03	Yes	2.00	Line change	
15:03	15:12	Yes	0.15	Extended line change	
15:12	17:15	Yes	2.05	Production - 2D	ORS01-07 sp 1000-1985 completed.
17:15	19:08	Yes	1.88	Line change	
19:08	21:00	Yes	1.87	Production - 2D	ORS01-11 sp 1748-870 completed.
21:00	23:00	Yes	2.00	Line change	
23:00	23:58	Yes	0.97	Extended line change	
23:58	23:59	Yes	0.03	Production - 2D	ORS01-17 sp 1000-1014 continues.
23:59	23:59	Yes	0.00	Production - 2D	Midnight sp 1014

Hours today = 24.00

VESSEL DAILY REPORT

r/v Geo Arctic **06 June 2001**

Project Number : 34834Report Number : 3

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

Timing analysis :-

Chargeable :-	**Today's Hours**	**Accumulated Hours**	
Extended line change	1.83	2.90	4.03%
Line change	11.47	22.55	31.32%
Mob / Demob	0.00	14.03	19.49%
Production - 2D	10.70	28.32	39.33%
Total =	**24.00**	**67.80**	**94.17%**

Non Chargeable :-	**Today's Hours**	**Accumulated Hours**	
Navigation	0.00	4.20	5.83%
Total =	**0.00**	**4.20**	**5.83%**

Total time at sea on this Project = **72.00** hours or **3.00** days

WEATHER :

	Winds		**Press.**	**Sea state**
	m/s	**degr's**	**mBar**	**code**
06:00	5	20	1020	2
12:00	5	110	1019	3
18:00	6	100	1016	2
24:00	10	3	1014	4

Weather forecast (Beaufort scale)

Tomorrow ENE7, swell ENE 2.5m

Day After WNW5, swell WNW 1.5m

Out Look WNW 6, swell WNW 3m

PERSONNEL : 50 Persons on board the vessel today

SAFETY : No incidents to report.

INTENTIONS FOR NEXT 24 HRS :

PARTY CHIEF'S COMMENTS :

CLIENT REP. COMMENTS : No additional comments..

Signed :-

Party Chief: John Carrey **Client Representative:** Rodney Waldon

VESSEL DAILY REPORT

r/v Geo Arctic **06 June 2001**

Project Number : 34834Report Number : 3

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

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VESSEL DAILY REPORT

r/v Geo Arctic **07 June 2001**

Project Number : 34834Report Number : 4

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

To: F-GAS AS, Oslo. Atten : D.Nolan, H.C. Vagge, D.S. Stensholt, J. Helgebostad. MAROPS

To: Jenny Bauer, Manager Offshore Exploration

Lines acquired today on this Project :-

Seq.	Line	Dir	Type	FSP	FCSP	LCSP	LSP	Chargeable	Non Chargeable	Status
14	ORS01 17	56	2D	1015	1015	2331	2331	24.694	0.000	COMPLETED
15	ORS01 18	233	2D	1802	1802	870	870	17.494	0.000	COMPLETED
16	ORS01 19	54	2D	1000	1000	2250	2250	23.456	0.000	COMPLETED
17	ORS01 20	321	2D	1800	1800	870	870	17.456	0.000	COMPLETED
18	ORS01 16	323	2D	1801	1801	870	870	17.475	0.000	COMPLETED

Production total for today = 100.575 0.000 km

Total acquisition on this project = 83.24% 352.125 2.681 km

Daily timings :- All report times in UTC, the local time zone is UTC + 10 hours

Start	End	Chargeable	Hrs	Activity	Details
00:00	02:45	Yes	2.75	Production - 2D	ORS01-17 sp 1015-2331 Completed.
02:45	04:45	Yes	2.00	Line change	
04:45	05:40	Yes	0.92	Extended line change	
05:40	07:38	Yes	1.97	Production - 2D	ORS01-18 sp 1802-870 Completed
07:38	09:38	Yes	2.00	Line change	
09:38	09:49	Yes	0.18	Extended line change	
09:49	12:26	Yes	2.62	Production - 2D	ORS01-19 sp 1000-2250 Completed.
12:26	14:26	Yes	2.00	Line change	
14:26	15:48	Yes	1.37	Extended line change	
15:48	17:46	Yes	1.97	Production - 2D	ORS01-20 sp 1800-870 Completed.
17:46	19:46	Yes	2.00	Line change	
19:46	20:43	Yes	0.95	Extended line change	
20:43	22:43	Yes	2.00	Production - 2D	ORS01-16 sp 1801-870 Completed.
22:43	23:59	Yes	1.28	Line change	

Hours today = 24.00

Timing analysis :-

Chargeable :-	**Today's Hours**	**Accumulated Hours**

Extended line change	3.42	6.32	6.58%
Line change	9.28	31.83	33.16%
Mob / Demob	0.00	14.03	14.62%
Production - 2D	11.30	39.62	41.27%
Total =	**24.00**	**91.80**	**95.63%**

VESSEL DAILY REPORT

r/v Geo Arctic **07 June 2001**

Project Number : 34834Report Number : 4

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

Non Chargeable :-	**Today's Hours**	**Accumulated Hours**	
Navigation	0.00	4.20	4.37%
Total =	**0.00**	**4.20**	**4.37%**

Total time at sea on this Project = **96.00** hours or **4.00** days

WEATHER :

	Winds		Press.	Sea state	Weather forecast
	m/s	degr's	mBar	code	(Beaufort scale)
06:00	6	50	1012	3	**Tomorrow** ENE7, swell ENE 2.5m
12:00	7	90	1011	3	**Day After** WNW5, swell WNW 1.5m
18:00	10	0	1010	3	**Out Look** WNW 6, swell WNW 3m
24:00	12	350	1008	3	

PERSONNEL : 50 Persons on board the vessel today

SAFETY : No incidents to report.
No whales sighted.

PROCESSING :

Line 13: Stack produced. Noise levels good. Average noise level for line is 3.44 microbars SOL = 2.76, EOL = 3.53, from noise files).

Line 13A: Stack produced. Noise levels ok. Average noise level for line is 4.66 microbars (SOL = 3.20, EOL = 3.04, from noise files).

Line 10: Stack produced. Noise levels good. Average noise level for line is 3.77 microbars (SOL = 3.19, EOL = 3.42, from noise files).

Line 04: Stack produced. Noise levels good. Average noise level for line is 3.707 microbars (SOL = 2.95, EOL = 3.07, from noise files).

Line 01: Stack produced. Noise levels good. Average noise level for line is 3.77 microbars (SOL = 3.41, EOL = 5.05, from noise files).

Line 09: Stack produced. Noise levels good. Average noise level for line is 3.86 microbars (SOL = 2.77, EOL = 3.19, from noise files).

INTENTIONS FOR NEXT 24 HRS : Expect to complete site by 15:00 utc 8th June, will recover equipment and head for Grassy point, King Island unless a helicopter is arranged to take off the Clinet representative.

PARTY CHIEF'S COMMENTS : All lines shot today are in spec. No fishing activity, all shipping gives our cable a wide berth. The wind was increasing to 12 m/s as forecast by the end of the day with an increasing choppy sea.

CLIENT REP. COMMENTS : No additional comments..

Signed :-

Party Chief: John Carrey **Client Representative:** Rodney Waldon

GEOTEAM

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VESSEL DAILY REPORT

r/v Geo Arctic **08 June 2001**

Project Number : 34834Report Number : 5

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

To: F-GAS AS, Oslo. Atten : D.Nolan, H.C. Vagge, D.S. Stensholt, J. Helgebostad. MAROPS

To: Jenny Bauer, Manager Offshore Exploration

Lines acquired today on this Project :-

Seq.	Line	Dir	Type	FSP	FCSP	LCSP	LSP	Chargeable	Non Chargeable	Status
19	ORS01 15	145	2D	1000	0	0	2198	0.000	22.462	NTBP
20	ORS01 06	24	2D	1000	0	0	1077	0.000	1.444	NTBP
21	ORS01 15A	145	2D	1000	1000	2198	2198	22.481	0.000	COMPLETED
22	ORS01 06A	24	2D	1000	1000	1984	1984	18.469	0.000	COMPLETED
							Production total for today =	**40.950**	**23.906**	**km**
							Total acquisition on this project =	**92.93%**	**393.075**	**26.588** **km**

Daily timings :- All report times in UTC, the local time zone is UTC + 10 hours

Start	End	Chargeable	Hrs	Activity	Details
00:00	00:42	Yes	0.70	Line change	
00:42	03:14	Yes	2.53	Weather	ORS01-15 sp 1000-2198 Rejected.due to swell noise.
03:14	06:37	Yes	3.38	Weather	Line turn
06:37	06:47	Yes	0.17	Weather	ORS01-06 sp 1000-1077 Aborted due to swell noise.
06:47	14:41	Yes	7.90	Weather	Steaming north dueing bad weather.
14:41	17:16	Yes	2.58	Production - 2D	ORS01-15A sp 1000-2198 Completed.
17:16	19:16	Yes	2.00	Line change	
19:16	19:57	Yes	0.68	Extended line change	
19:57	22:00	Yes	2.05	Production - 2D	ORS01-06A sp 1000-1984 Completed.
22:00	23:59	Yes	2.00	Line change	

Hours today = 24.00

Timing analysis :-

Chargeable :-	Today's Hours	Accumulated Hours	
Extended line change	0.68	7.00	5.83%
Line change	4.70	36.53	30.44%
Mob / Demob	0.00	14.03	11.69%
Production - 2D	4.63	44.25	36.87%

Weather	13.98	13.98	11.65%
Total =	**24.00**	**115.80**	**96.50%**

VESSEL DAILY REPORT

r/v Geo Arctic **08 June 2001**

Project Number : 34834Report Number : 5

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

Non Chargeable :-	**Today's Hours**	**Accumulated Hours**	
Navigation	0.00	4.20	3.50%
Total =	**0.00**	**4.20**	**3.50%**

Total time at sea on this Project =**120.00**hours or **5.00** days

WEATHER :

	Winds		**Press.**	**Sea state**	**Weather forecast**
	m/s	**degr's**	**mBar**	**code**	**(Beaufort scale)**
06:00	16	340	1007	5	**Tomorrow** SW5, swell 1-2m
12:00	12	300	1009	4	**Day After**
18:00	5	290	1010	3	**Out Look**
24:00	5	280	1011	4	

PERSONNEL : 50 Persons on board the vessel today

SAFETY : No incidents to report. No whales sighted

QC PROCESSING :

Line 07: Stack produced. Noise levels good. Average noise level for line is 4.18 microbars (SOL = 2.96, EOL = 3.41, from noise files).

Line 11: Stack produced. Noise levels good. Average noise level for line is 3.53 microbars (SOL = 2.49, EOL = 2.67, from noise files).

Line 17: Stack produced. Noise levels good. Average noise level for line is 3.78 microbars (SOL = 2.84, EOL = 2.99, from noise files).

Line 18: Stack produced. Noise levels good. Average noise level for line is 3.95 microbars (SOL = 2.89, EOL = 3.29, from noise files).

Line 19: Stack produced. Noise levels good. Average noise level for line is 3.77 microbars (SOL = 2.79, EOL = 3.45, from noise files).

Line 15: Stack produced. Noise levels out of spec. Line to be reshot.

Line 06: NTBP - Aborted line as noise levels were out of spec.

INTENTIONS FOR NEXT 24 HRS : Acquire last line ORS01-14 to complete this project.

PARTY CHIEF'S COMMENTS : Increasing weather and swell after the start of line –15 this morning put all of the data out of specification. After the swell had deminished line –15A was acquired with the cable at 10m. As swell continued to decrease line -06A was acquired with the cable back to 7.5m depth.

No fishing boat activity seen, only passing shipping which kept a wide berth.

CLIENT REP. COMMENTS : No additional comments..

Signed :-

Party Chief: John Carrey

Client Representative: Rodney Waldon

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VESSEL DAILY REPORT

r/v Geo Arctic **09 June 2001**

Project Number : 34834Report Number : 6

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

To: F-GAS AS, Oslo. Atten : D.Nolan, H.C. Vagge, D.S. Stensholt, J. Helgebostad. MAROPS

To: Jenny Bauer, Manager Offshore Exploration

Lines acquired today on this Project :-

Seq.	Line	Dir	Type	FSP	FCSP	LCSP	LSP	Chargeable	Non Chargeable	Status
23	ORS01 14	302	2D	2548	2548	870	870	31.481	0.000	COMPLETED
						Production total for today =		**31.481**	**0.000**	**km**
						Total acquisition on this project =	**100.00%**	**424.556**	**26.588**	**km**

Daily timings :- All report times in UTC, the local time zone is UTC + 10 hours

Start	End	Chargeable	Hrs	Activity	Details
00:00	01:43	Yes	1.72	Extended line change	
01:43	05:15	Yes	3.53	Production - 2D	ORS01-14 sp 2548-1000 completed.
05:15	06:06	Yes	0.85	Mob / Demob	Start recovery of guns.
06:06	06:22	Yes	0.27	Mob / Demob	Helicopter on deck to take off Client Rep.
06:22	07:00	Yes	0.63	Mob / Demob	Reover all guns.
07:00	12:45	Yes	5.75	Mob / Demob	Recover cable.
12:45	23:59	Yes	11.25	Mob / Demob	Transit NW back to Otway/Sorell Basin area. ** End of Project **

Hours today = 24.00

Timing analysis :-

Chargeable :-	**Today's Hours**	**Accumulated Hours**	
Extended line change	1.72	8.72	6.05%
Line change	0.00	36.53	25.37%
Mob / Demob	18.75	32.78	22.77%
Production - 2D	3.53	47.78	33.18%
Weather	0.00	13.98	9.71%
Total =	**24.00**	**139.80**	**97.08%**

Non Chargeable :-	**Today's Hours**	**Accumulated Hours**

Navigation	0.00	4.20	2.92%
Total =	**0.00**	**4.20**	**2.92%**

VESSEL DAILY REPORT

r/v Geo Arctic **09 June 2001**

Project Number : 34834Report Number : 6

Client :Origin Energy Resources Ltd Bass Basin Tasmainia-Shelduck

Client's Ref No :T/18P 2D Exclusive.

Total time at sea on this Project =**144.00**hours or **6.00** days

WEATHER :

	Winds		Press.	Sea state	Weather forecast
	m/s	degr's	mBar	code	(Beaufort scale)
06:00	6	Var	1015	2	**Tomorrow** No info
12:00	16	90	1020	6	**Day After**
18:00	13	100	1021	5	**Out Look**
24:00	14	90	1023	5	

PERSONNEL : 50 Persons on board the vessel today

SAFETY : No incidents to report. No Whale sightings, One helicopter landing, no problems

PROCESSING :

Line 20: Stack produced. Noise levels good. Average noise level for line is 3.53 microbars (SOL = not recorded, EOL = 2.64, from noise files).
Line 16: Stack produced. Noise levels good. Average noise level for line is 4.29 microbars (SOL = 2.73, EOL = 3.81, from noise files). One bad channel.
Line 15A: Stack produced. Noise levels ok. Average noise level for line is 5.89 microbars (SOL = 5.5, EOL = 3.2, from noise files).
Line 06A: Stack produced. Noise levels good. Average noise level for line is 3.85 microbars (SOL = 3.7, EOL = 3.3, from noise files). One bad channel.
Line 14: Stack produced. Noise levels good. Average noise level for line is 3.80 microbars (SOL = 3.22, EOL = 3.18, from noise files). One bad channel.
END OF PROJECT - ALL LINES QC'd

PARTY CHIEF'S COMMENTS : Line ORS01-14 shot in quiet conditions with the cable at 7.5m.
All seismic tapes, logs and navigation disks and tapes with the exception of the last line –14 packed up and given to the Client rep to hand carry on the helicopter to the Client's office. The last line was not included as there was not sufficient time to make a security copy.
The recovery of the cable took two hours longer than expected due to the sudden increase in wind and swell after sun down. Vessel ended the day in transit back to Victorian water to resume the previous project.

CLIENT REP. COMMENTS : No additional comments..

Signed :-

Party Chief: John Carrey **Client Representative:** Rodney Waldon

8. NAV PROCESSING SUMMARY LOG

Client: Origin Energy **Job#: 34834** **Area: Shelduck Permit T/18P**

Line Name	Seq #	P190 file name Sp range	P294 file Sp range	Status/Comments
ORS01-03	001	ors01-03.p1 Sp1000-2091	Ors01-03.294 Sp1000-2091	OK Seq001-004 min offset 143m in P294, offset corrected for seq 005 onwards to 150m after first break analysis. Seq 001-004 corrected in nav processing
ORS01-13	002	ors01-13.p1 Sp2707-2033	Ors01-13.294 Sp2707-2033	OK, stopped early d/t Nav software hangup
ORS01-13A	003	ors01-13a Sp2163-869	Ors01-13A.294 Sp2163-869	OK
ORS01-12	004	ors01-12.p1 Sp1000-2518	Ors01-12.294 Sp1000-2518	OK
ORS01-10	005	ors01-10.p1 Sp1828-870	Ors01-10.294 Sp1828-870	OK
ORS01-08	006	ors01-08.p1 Sp1000-1986	Ors01-08.294 Sp1000-1986	OK
ORS01-04	007	ors01-04.p1 Sp2014-870	Ors01-04.294 Sp2014-870	OK
ORS01-02	008	ors01-02.p1 Sp1000-2144	Ors01-02.294 Sp1000-2144	OK
ORS01-01	009	ors01-01.p1 Sp 1802-870	Ors01-01 Sp1802-870	Ok
ORS01-05	010	ors01-05.p1 Sp1000-1984	Ors01-05.294 Sp1000-1984	OK
ORS01-09	011	ors01-09.p1 Sp1801-870	Ors01-09.294 Sp1801-870	OK
ORS01-07	012	ors01-07.p1 Sp1000-1985	Ors01-07.294 Sp1000-1985	OK
ORS01-11	013	ors01-11.p1 Sp1748-870	Ors01-11.294 Sp1748-870	OK
ORS01-17	014	ors01-17.p1 Sp1000-2331	Ors01-17.294 Sp1000-2331	OK
ORS01-18	015	ors01-18.p1 Sp1802-870	Ors01-18.294 Sp1802-870	OK
ORS01-19	016	ors01-19.p1 Sp1000-2250	Ors01-19.294 Sp1000-2250	OK
ORS01-20	017	ors01-20.p1 Sp1800-870	Ors01-20.294 Sp1800-870	OK
ORS01-16	018	ors01-18.p1 Sp1801-870	Ors01-18.294 Sp1801-870	OK
ORS01-15	019	ors01-15.p1 Sp1000-2198	Ors01-15.294 Sp1000-2198	Scratched d/t streamer noise
ORS01-06	020			Scratched d/ streamer noise
ORS01-15A	021	ors01-06a.p1 Sp1000-2198	ORS01-15A.294	OK (line shot with incorrect parameter setup in Ministreamer,

			Sp1000-2198	parameter adjustments made in processing)
ORS01-06A	022	ors01-06a.p1 Sp1000-1984	ORS01-06A.294 Sp1000-1984	OK (line shot with incorrect parameter setup in Ministreamer, parameter adjustments made in processing)
ORS01-14	023	ors01-14.p1 Sp2548-870	Ors01-14.294 Sp2548-870	OK

9. HARDWARE

Processing was carried out using the following hardware:

Workstation	:	Silicon Graphics Origin server • 4 x 225Mhz MIPS R10000 Processors with MIPS R10010 FPUs • 3Gb main memory • 176Gb hard disk. • internal 8mm Exabyte Tape drive • 1 x 12" terminal and keyboard
Graphic Displays	:	1. Silicon Graphics O2 workstation • 1 x 180MHz MIPS R5000 Processor with MIPS R5000 FPU • 128 MB RAM • 1 x 21" Graphic Monitor and keyboard 2. Silicon Graphics Indy workstation • 1 x 100 MHz MIPS R4600 Processor • 32 MB RAM • 1 x 21" Graphic Monitor and keyboard
Storage	:	Two IBM 3590 Tapes drives both with autoloader
Plotter	:	OYO 36" thermal plotter with Versatec 130 SCSI interface
Printer	:	HP Laser Jet 5Si MX PostScript Printer
PC	:	Computer x86 Family 6 Model 8 Stepping 3 AT/AT Compatible • 2 x 750MHz Intel Pentium III Processors • DC20 SCSI Capture card for connection with MSX • 256 Mb RAM • 89Gb disk memory. • 32 Mb ATI Technologies Inc. Rage128 GL (AGP) Graphic Adapter • 1 x 19" Monitor and keyboard

10. SOFTWARE

Workstations:	SGI Origin: IRIX64 version 6.5 Paradigm Focus version 4.3 DISCO version 12.3 SGI O2: IRIX64 version 6.5 SGI Indy: IRIX64 version 5.3
PC - SeisNet:	Microsoft Windows NT 4.00.1386 Software System Inc. SeisNet Version 5.109 GUIServer Version 1.0
PC - General Usage:	Microsoft Windows NT 4.00.1386 Microsoft® Word 97™ and Excel 97™

11. LINE LOG SPREADSHEET

Sequence No	Line	First SP	Last SP	Km sailed	Hrs recording	Hrs line change to next line	Tape Number	Comments
1	ORS01-03	1000	2091	20.475	2.35	3.69	1	
2	ORS01-13	2707	2022	12.656	1.43	4.2	2	Aborted - Navigation equipment failure.
3	ORS01-13A	2032	869	21.825	2.45	2.53	3	
4	ORS01-12	1000	2518	28.4813	3.18	2.32	4, 5	
5	ORS01-10	1828	870	17.9813	2	1.88	6	
6	ORS01-08	1000	1986	18.5063	2.08	1.52	7	
7	ORS01-04	2014	870	21.4688	2.43	1.68	8	
8	ORS01-02	1000	2144	21.469	2.45	1.58	9	
9	ORS01-01	1802	870	17.4938	1.95	2.25	10	
10	ORS01-05	1000	1984	18.4688	2.1	2.47	11	
11	ORS01-09	1801	870	17.475	1.93	2.15	12	
12	ORS01-07	1000	1985	18.4875	2.05	1.88	13	
13	ORS01-11	1748	870	16.4813	1.87	2.97	14	
14	ORS01-17	1000	2331	24.9769	2.78	2.92	15	
15	ORS01-18	1802	870	17.4938	1.97	2.18	16	
16	ORS01-19	1000	2250	23.4563	2.62	3.37	17	
17	ORS01-20	1800	870	17.4563	1.97	2.95	18	
18	ORS01-16	1801	870	17.475	2	1.38	19	
19	ORS01-15	0	0	0	2.53	3.38	20 ntbp	Aborted -High seas- noise
20	ORS01-06	0	0	0	0.17	7.9	21 ntbp	Aborted -High seas- noise
21	ORS01-15A	1000	2198	22.4813	2.58	2.68	22	
22	ORS01-06A	1000	1984	18.4688	2.05	3.72	23	
23	ORS01-14	2548	870	31.4813	3.533		24, 25	