

Nexus Energy

Survey: Deep Water & Bronze Whaler

Area: VIC P/49 SE Australia

MGC Job No: 6318

FINAL SURVEY REPORT

From



M/V Pacific Titan

June 11th to July 17th 2007



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1. Survey Information and Objectives

Nexus Energy Ltd agreed to enter into a service contract for the purpose of acquisition of a marine seismic 2D survey. The survey was conducted on the South East coast of Australia in the Gippsland Basin, in the area of VIC/P49; approximately 1696 Km of data was acquired

Water depth in the survey area was approximately 200 to 3000mtrs.

The Acquisition was performed by the seismic survey vessel Pacific Titan, owned by Swire Pacific Offshore and operated by CGGVeritas.

Source volume was 3440 cubic inches at a depth of 6 m.

Streamer configuration was 1 x 6000 m, towed at a depth of 7.0m +/- 0.5 m.

Streamer depth occasionally lowered to 9m at client's request.

Recording length 6500 ms and 18.75m shot point interval for Bronze Whaler area

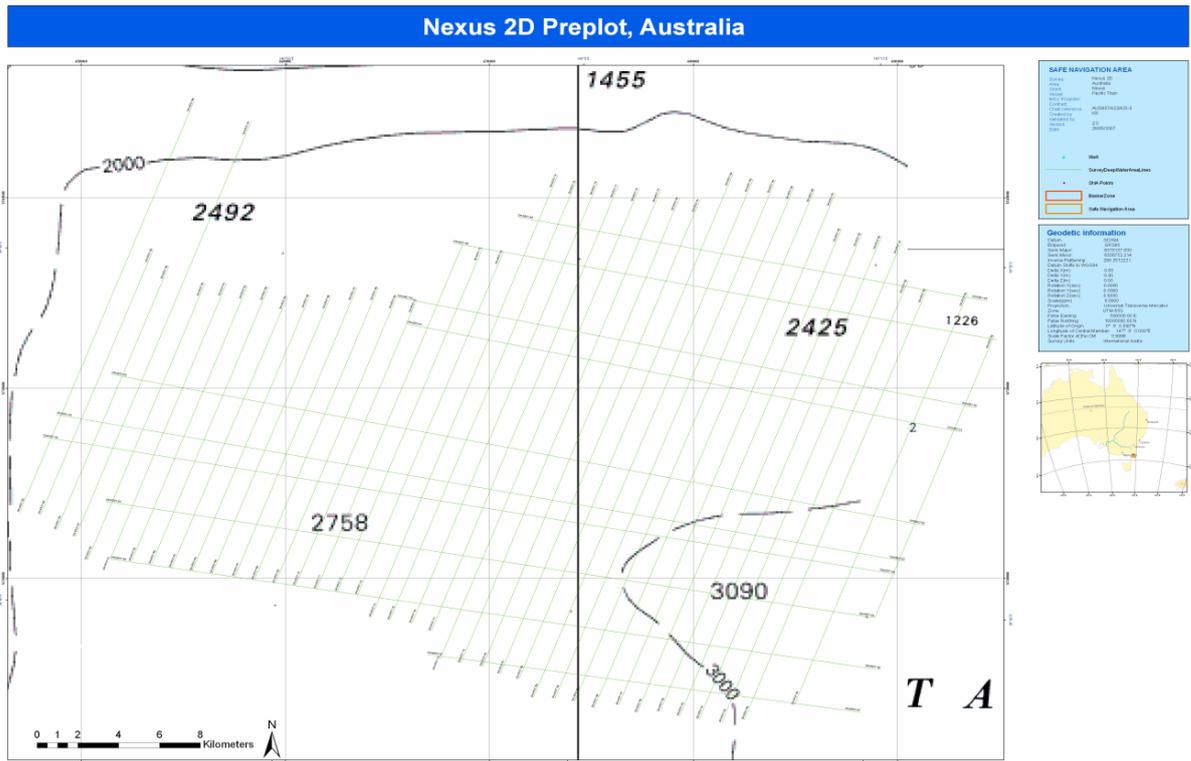
Recording length 8500 ms and 25.00m shot point interval for Deep water area

Chargeable production started on the 14th June at 07:23 and completed 17th July at 06:28 GMT.

All lines were pre-fixed with VGNXS07-

Upon survey completion, Pacific Titan recovered all trailing equipment and departed the area.

1.2.2. Deep Water Prospect



1.3. Acquisition Parameters

Contract Number	6318
Survey name	Deep Water Area & Bronze Area 2D Survey (Block VIC/P49)
Location	Gippsland Basin, Australia
Survey carried out by	Pacific Titan
Date	14 th June to 17 th July 2007 (GMT)
Total number of sequences	108
Trace number	1 x 480
Nominal fold	120 (Seq. 001-058) and 160 (Seq. 001-050)

1.3.1. Energy source

Type of energy source	Bolt Long Life
Mode	Single 2 string
Shot point interval	25.0m (Seq. 001-058) and 18.75m (Seq. 001-050)
Number of sources	1
Volume source	3440 cu.in. / array (2 arrays)
Air pressure	1950 psi +/- 10%
Source depth	6.0 m (+/- 1m)
Source separation	7.0 m

1.3.2. Streamers

Number of streamers	1
Streamer length	1 x 6000m
Number of traces	480
Trace interval	12.5 m
Group length	12.5 m
Operating Depth	7m +/- 1.0 m (streamer lowered to 9m during periods of bad weather)
Near Offset	78 m

1.3.3. Recording system

System	Sercel SEAL
Data format	SEG-D 8058 rev.1
Media	10GB 3590D cartridges
Number of channels	480 + 24 auxiliary channels used
Low cut Filter	Out
High cut Filter	200 Hz at 370 dB / Octave
Record length	8500 ms and 6500ms
Sample interval	2 ms

2. Vessel Description

2.1. Vessel Specifications – Pacific Titan

M/V Pacific Titan is capable of performing both 2D and 3D seismic data acquisition work. For 2D work the vessel can tow 12 000 meters streamers. For 3D seismic work the vessel can do dual source/dual streamer (2X6000m) operation providing high quality 2D and 3D seismic data for the industry. Features include a SEAL-24 system configurable for multiple streamers. Options include real-time seismic processing, acoustic source positioning, acoustic streamer positioning and onboard navigation. The following are general specifications for the vessel and seismic equipment on board.



Vessel Information

Description: 6,400 BHP Seismic Survey Vessel
Classification: A1 (E) Seismic Research
AMS ACCU
Built: Japan, 1982,
Conversion later in Seattle
Flag: Singapore
Call Sign: 9V5935
IMO No. : 8208385

Dimensions

Length, overall: 64.5 m
Length BP: 55.2 m
Breadth, moulded: 18.5 m
Depth, moulded: 6.0 m
Summer Draft: 5.18 m
GRT: 3211.0
NRT: 963.0

Machinery

Main engines: 4 x 1,600 BHP, 6Z-ST Total 6,400
BHP Propellers in Kort Nozzles
Bow Thruster: 420 BHP Yanmar 6LAAL-DTN 5
tones thrust, CP propeller
Rudders: Trailing Flap
Generator: 3 x 280 kW Yanmar 6LAAL-DTN
Speed: 4 x engines,
Max: 12.0 kts/14 tons/day
Service: 10 kts/10 tons/day
2 x engines: 9.0 kts/9 tons/day

Electronics

Radar: Furuno FR 1505 Mk III ARPA
Secondary Radar: Furuno FR 1510 Mk III
GPS: Furuno GP 30
Echo Sounder: Simrad ED-162 and Simrad EA 600
Communications: G.M.D.S.S. Skanti SSB, VHF,
Inmarsat C 456304540 /
456304550
Weather Fax: Furuno 207
Satcom B: NERA Inmarsat phone/fax
Tel (870) 356 304 510
Vsat: Instrumentroom +47 51 40 76 11
Party Chief +47 51 40 76 12
Chiefs office +47 51 40 76 13
Bridge/Fax +47 51 40 76 14
High Speed data link: NERA Inmarsat system:
Tel (870) 356 304 510

Miscellaneous:

Fire monitoring and detection to all work areas
USCG approved sewage treatment plant.
Incinerator, macerator and compactor.
Six man inflatable Man-overboard boat on quick release
davit
LSA equipment for 45 persons excluding survival suits.
Foam deluge system covering streamer winches, streamer
storage reels and helideck.
P.A. System
Stainless steel gun deck.
Helideck rated for Bell 212 or equivalent with lights.
FRC: 21 feet Nor Power.

2.2. Seismic Particulars

2.2.1. Streamer and Sensors Details

Item	Description	Type	Amount	Remark
Streamer	24 bit, digital distributed electronic	Sercel solid SEAL	Up to 12 km active	64 mm diameter
Depth Control	Digicourse	5011	22 per streamer	Located every 300 m along the streamer
Buoyancy		Foam		
Retrievers	Concorde	500	7 per streamer	1 every 900 meters
Streamer skin	Polyurethane	Solid		3.5 mm thickness
Hydrophones	Sercel Radial	Piezoelectric		Sercel 12-element radial
Section Length	150 m			
Section diameter	64 mm			
Lead-in	Sercel	Armoured	350 m.	
Group Length	12.5 m			
No of hydrophones per group	8	Sercel 12 element radial.		790 nF Group capacitance 21.5 V/Bar sensitivity
Max number of channels	2000			12.5 m @ 2ms
Telemetry data link	Dual twisted quartet	AWG 22		
Aux. Data link	4 twisted pair	AWG 22		
Power lines	Dual	AWG 14		
Connectors	28 points	AWG 16		

2.2.2. Recording System Details

Item	Description	Type	Amount	Remark
Acquisition	SEAL V 5.0	Sercel	1	Max 10 000 channels
Format	SEG D Vs1	De-multiplexed		
Recording	IBM 3590 drives via Argus Hard disk	IBM computer	4	3590 cartridges
Computer	Sun	Blade 2000	2	
Bird Controller		Digicourse	22 per streamer	
Graphic user I/F	Unix/Seapro	X11 Ultra 5		Sercel
Terminal	Sun	21"	2	
Sampling	2 ms			¼, 1/2, 1, 2, 4 ms
Aux channels			36	Max 255
Plotter	24"	Veritas	1	On-line (Not used)
Printer	A4			Label
Printer	A4			Logs, tests etc.
Network	Ethernet	Twisted pair		Category 5 TCP/IP
Argus Raid	Intel Xeon	Raid drive		Data storage/Backup

2.2.3. Seismic QC Details

Item	Description	Type	Amount	Remark
Online Qc	SEAPRO QC Vs 4.0	Sercel	1	Online seismic QC, fully Integrated with recording system.
Offline Qc	ProMAX	Landmark	1	Brute stacks, etc
Plotter	24"	Veritas	1	
Computer	Supermicro	rackmount	1	
Terminals	Sun	21"	2	
Graphic user interface	Linux	Redhat Enterprise		
Remote	X terminal			Sat. link
Network	Ethernet	Twisted pair		Category 5 TCP/IP
Product options		High resolution seismic record display. Pre-filtering of seismic data. Attribute calculation First break picking. Signal to noise ratio. Seismic trace energy. Noise level. Seismic trace frequency analysis. Single trace displays. Attribute db generation		

2.2.4. Navigation Details

Item	Description	Type	Amount	Remark
Navigation online	Concept Systems	Spectra		v10.9.01
Navigation offline	FGPS / Reflex	Seispos		v13.58
Work Stations	Linux workstations	IBM eserver	2	
Network	Ethernet	Twisted pair		Category 5 TCP/IP
PC workstation	Sony	Shuttle	1	
Printer	HP	Laser	1	Network to 12"
Compasses	Digicourse	5011	19 per streamer	Every 300 meter along the streamer + more in the front and tail end.
Streamer positioning	RGPS	Seatrack 220	2	1 on each tailbuoy
Source Positioning	RGPS	Seatrack 320	4	1 on each string. 2 Arrays, 2 strings per array
Acoustics	Digicourse	CMX/CTX	20	1 x CTX per gun string 8 x CMX per streamer
Data logging	UKOOA	P2/94 P1/90		2 x Online hard disk, RAID 5
Echo Sounder	Simrad	EA600	1	12 KHz & 200 KHz
Gyro	Simrad	HS50	1	GPS Gyro
Autopilot	Robertson	AP9 Mk III	1	
Steering	RobTrack	STS500	1	
Helmsman Steering display	Spectra	Sony Shuttle	1	Located on the bridge

2.2.5. Source and Mechanical Department Details

Item	Description	Type	Amount	Remark
Acoustic source	Long Life	Bolt		6 acoustic positions per sub-array 8 sources per sub-array
Hanging Plates	Multiwave design	Multiwave		
Chambers	40 – 300 cu. inch.			
Cluster	8-ea clusters	Bolt		3 clusters on the outmost sub-arrays, 2 on the centre sub-array
Near field hydrophones	2540	I/O		3 per sub-array
Depth/pressure Sensors	2527B	I/O		3 per sub-array
Source	Varying configuration	Multiwave / Bolt	Single /dual	Typical: 90-110bar output
Compressors	Frick	TDSB 355	3	Capacity 3 x 2000 cu.ft/min
	Aerial	JGA4	3	
	Caterpillar	Prime mover	3	1 for ea. set of Frick/Aerial
Source controller	Gunlink 2000	Seamap		32 guns, expandable
Solenoid Power Supply	Gunlink 2000	Seamap		25 ms fire pulse width
Deflector	Multiwave	6 foils	2	150%
Gun Winches	Single	Odim remote ctrl.	5	Slip-ring, Air
Streamer winches	Single	Odim remote ctrl.	4	Each 9000 m (50 mm)
Spooling Device	Marine Project Development	Linear	4	Spooling on each streamer winch individually
Tow Points	Odim	Flexible	4	
Winch Control	Odim		2	

3. List of Key Personnel

3.1. Onboard Personnel

POSITION	Crew 1
Party Chief	Haydn Brook
Captain	Bruce Wallis
Chief Engineer	Thomas Broughton
Chief Observer	Tyrone Hackett
Shift Leader Observer	John Gracey
Chief Navigator	Steven Ryan
Shift Leader Navigation	Donald Hutchings
Chief Mechanic	Ralph Bennett
Shift Leader Mechanic	Regis Derrien
QC leader	Nikolay Gorbunov
Client Representative	William Lloyd

POSITION	Crew 2
Party Chief	Sigurd Østerud
Captain	Theodore Strockyj
Chief Engineer	Carl Sayers
Chief Observer	Allan Beatie
Shift Leader Observer	Mike Suis
Chief Navigator	Paul Stafford
Shift Leader Navigation	Griffiths Sam
Chief Mechanic	Markus Rahm
Shift Leader Mechanic	Ronaldo Morales
QC leader	Adam Gerbarski

3.2. Office Support Personnel

POSITION	NAME
Marine Operations Manager	Christian Brige
Operation Manager	Mark Brittain
Instrument Manager	Franck Andersen
Navigation Manager	Rafael Bouraly
Mechanic Manager	Steinar Hovland
QC support	Christophe Massacand

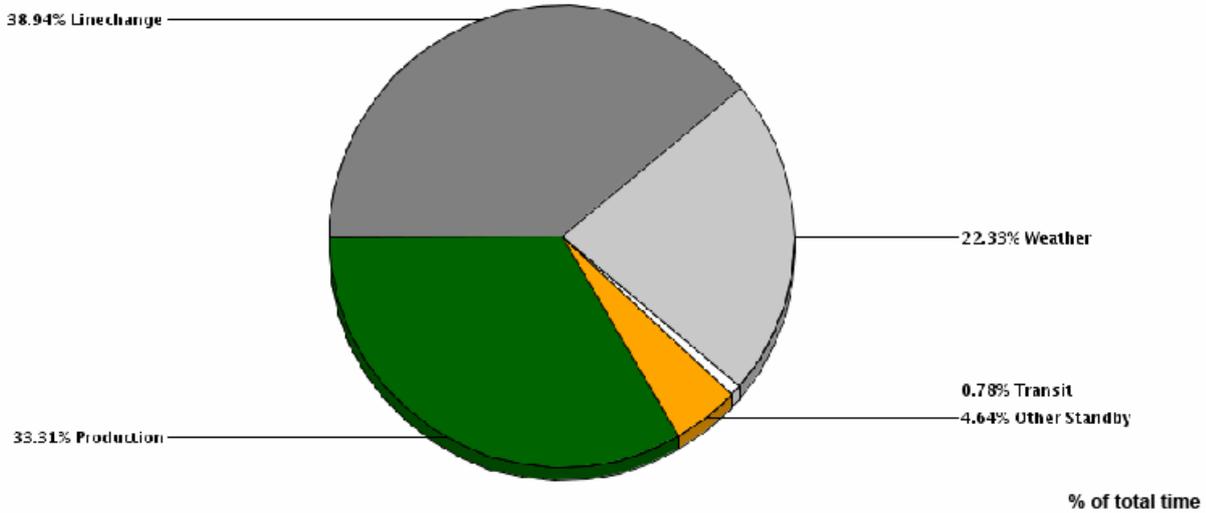
4. Field Information and Observations

4.1. Time Statistics

4.1.1. Bronze Whaler

Time Distribution

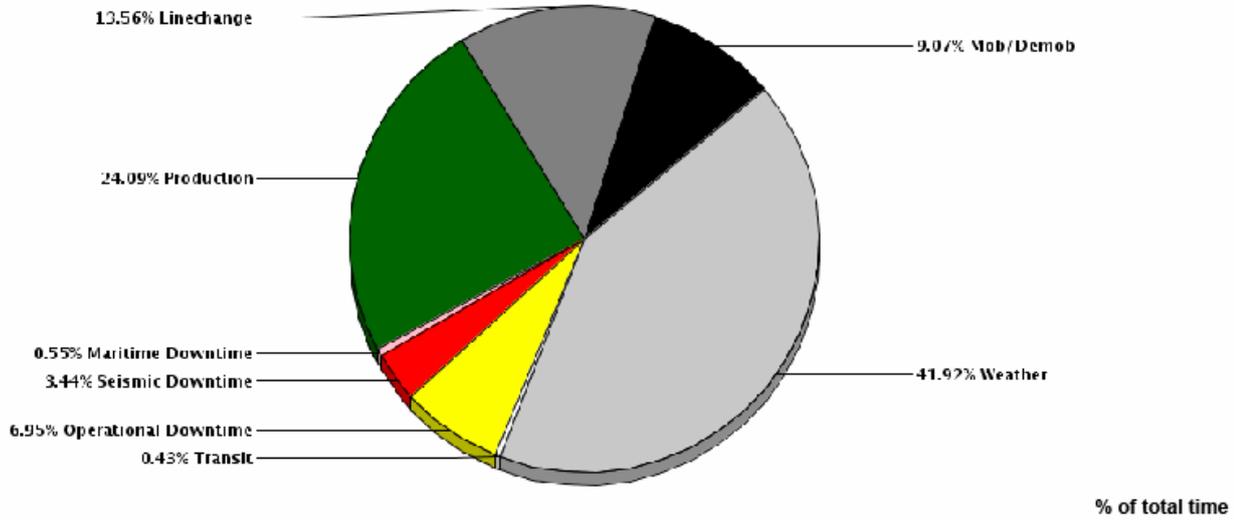
M/V Pacific Titan Client: Nexus Energy Survey: 501 11 70 06 07 01 Area: VICP49
Date: 05.07.2007 - 14.07.2007



4.1.2. Deep water

Time Distribution

M/V Pacific Titan Client:Nexus Energy Survey: 501 11 70 06 07 00 Area: VIC P49
Date: 11.06.2007 - 17.07.2007



4.2. Production Statistics

4.2.1. Bronze Whaler

Time Distribution

M/V Pacific Titan Client:Nexus Energy Survey: 501 11 70 06 07 01 Area: VICP49
Date: 05.07.2007 - 14.07.2007



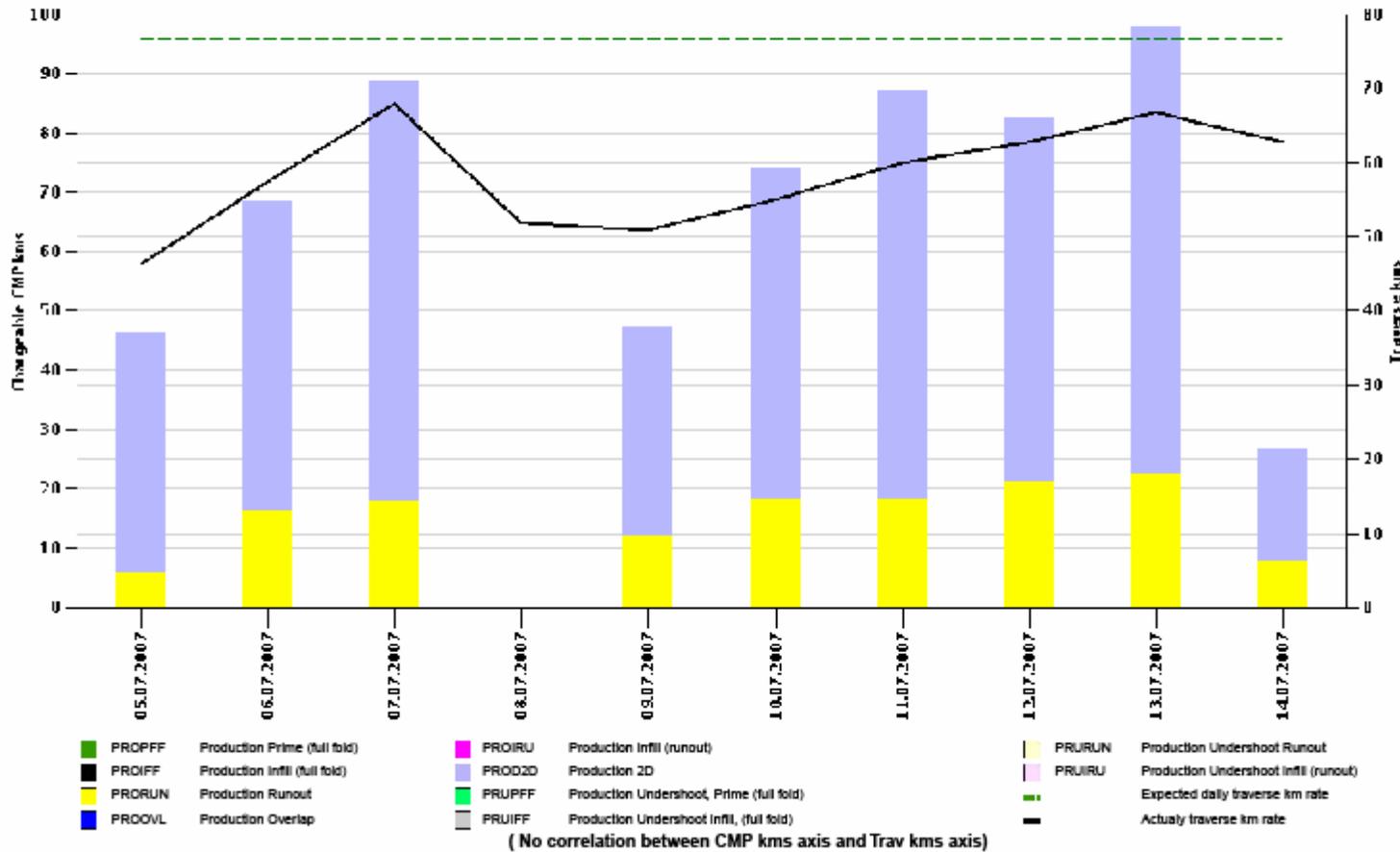
CHARGE CODES							Hidden downtime		
ACTIVITY	4	6	21	C	Total	%	RC	RB	
				CGG Time	hours		hrs	hrs	
Linechange									
LChert					2.40	2.40	1.09%		
LChnom					83.08	83.08	37.85%		
TOTAL					85.48	85.48	38.94%		
Production									
PROD2D			56.88		56.88	25.91%			
PRORUN	16.25				16.25	7.40%			
TOTAL	16.25	56.88			73.13	33.31%			
Standby Environment									
ENVcur								0.60	
ENVofs				9.58	9.58	4.37%			
ENVtra				0.60	0.60	0.27%			
TOTAL			10.18		10.18	4.64%		0.60	
Standby Weather									
WEasea			49.02		49.02	22.33%			
TOTAL			49.02		49.02	22.33%			
Transit									
Transi				1.72	1.72	0.78%			
TOTAL				1.72	1.72	0.78%			
TOTAL	16.25	56.88	60.92	85.48	219.53	100.00%		0.60	

Charge codes in use

4 Production Runout
6 Production 2D
21 Chargeable standby
C CGG Time

Production Summary

M/V Pacific Titan Client:Nexus Energy Survey: 501 11 70 06 07 01 Area: VICP49
Date: 05.07.2007 - 14.07.2007



Production Summary

M/V Pacific Titan Client:Nexus Energy Survey: 501 11 70 06 07 01 Area: VICP49

Date: 05.07.2007 - 14.07.2007



Chargeable CMP and km² summary

Date	PROFFF	PRORUN	PROIFF	PROIRU	PRUPFF	PRURUN	PRUIFF	PRUIRU	PROOVL	PROD2D	Total CMP kms	Total km²
05.07.2007		6.00000								40.27500	46.27500	
06.07.2007		16.05000								52.33125	68.38125	
07.07.2007		17.92500								70.81875	88.74375	
08.07.2007												
09.07.2007		12.00000								35.34375	47.34375	
10.07.2007		18.00000								56.15625	74.15625	
11.07.2007		18.00000								69.00000	87.00000	
12.07.2007		21.00000								61.51875	82.51875	
13.07.2007		22.36875								75.71250	98.08125	
14.07.2007		7.63125								19.05000	26.68125	
Total CMP		138.97500							480.20625		619.18125	
Total Km²												

- PROFFF Production Prime (full fold)
- PROIFF Production Infill (full fold)
- PRORUN Production Runout
- PROOVL Production Overlap
- PROIRU Production Infill (runout)
- PROD2D Production 2D
- PRUPFF Production Undershoot, Prime (full fold)
- PRUIFF Production Undershoot Infill, (full fold)
- PRURUN Production Undershoot Runout
- PRUIRU Production Undershoot infill (runout)

4.2.2. Deep water

Time Distribution

M/V Pacific Titan Client:Nexus Energy Survey: 501 11 70 06 07 00 Area: VIC P49
Date: 11.06.2007 - 17.07.2007



		CHARGE CODES							Hidden downtime	
ACTIVITY		4	6	21	C CGG Time	Tc corr	Total hours	%	RC hrs	RB hrs
Linechange										
LChext	Linechange, extended (survey shape only)				1.85		1.85	0.28%		
LChnom	Linechange, nominal				87.02		87.02	13.28%		
TOTAL					88.87		88.87	13.56%		
Mobilisation / Demobilisation										
DEeco	Demobilisation, recovering gear				4.37		4.37	0.67%		
MOdepl	Mobilisation, deploying gear				11.80		11.80	1.80%		
MOotr	Mobilisation, other				43.23		43.23	6.60%		
TOTAL					59.40		59.40	9.07%		
Operational downtime										
SUpctr	Support, crew change				45.52		45.52	6.95%		
TOTAL					45.52		45.52	6.95%		
Production										
PRD2D	Production 2D Line			140.42			140.42	21.43%		
PRORUN	Production Runout	17.40					17.40	2.66%		
TOTAL		17.40		140.42			157.82	24.09%		
Standby Environment										
ENvcur	Environmental, sea currents								3.46	
TOTAL									3.46	
Standby Weather										
WEasea	Weather/sea/swell (standby at sea)			158.67			158.67	24.22%		
WEport	Weather/sea/swell (standby in port)			116.00			116.00	17.70%		
TOTAL				274.67			274.67	41.92%		
TD IT & Telecom										
TOTAL										
TD MAR Equipment										
MAecom	Maritime, equipment, compressor					3.58	3.58	0.55%		
TOTAL						3.58	3.58	0.55%		
TD MEC Source										
MEsar	Mechanical, source, array airline					16.72	16.72	2.55%		

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Time Distribution

M/V Pacific Titan Client:Nexus Energy Survey: 501 11 70 06 07 00 Area: VIC P49
 Date: 11.06.2007 - 17.07.2007



MEshar	Mechanical, source, array hardware					2.15	2.15	0.33%		
TOTAL						18.87	18.87	2.88%		

Transit

TRansit	Transit, steaming					2.80	2.80	0.43%		
TOTAL						2.80	2.80	0.43%		

TOTAL		17.40	140.42	277.47	193.78	26.13	655.20	100.00%		3.46
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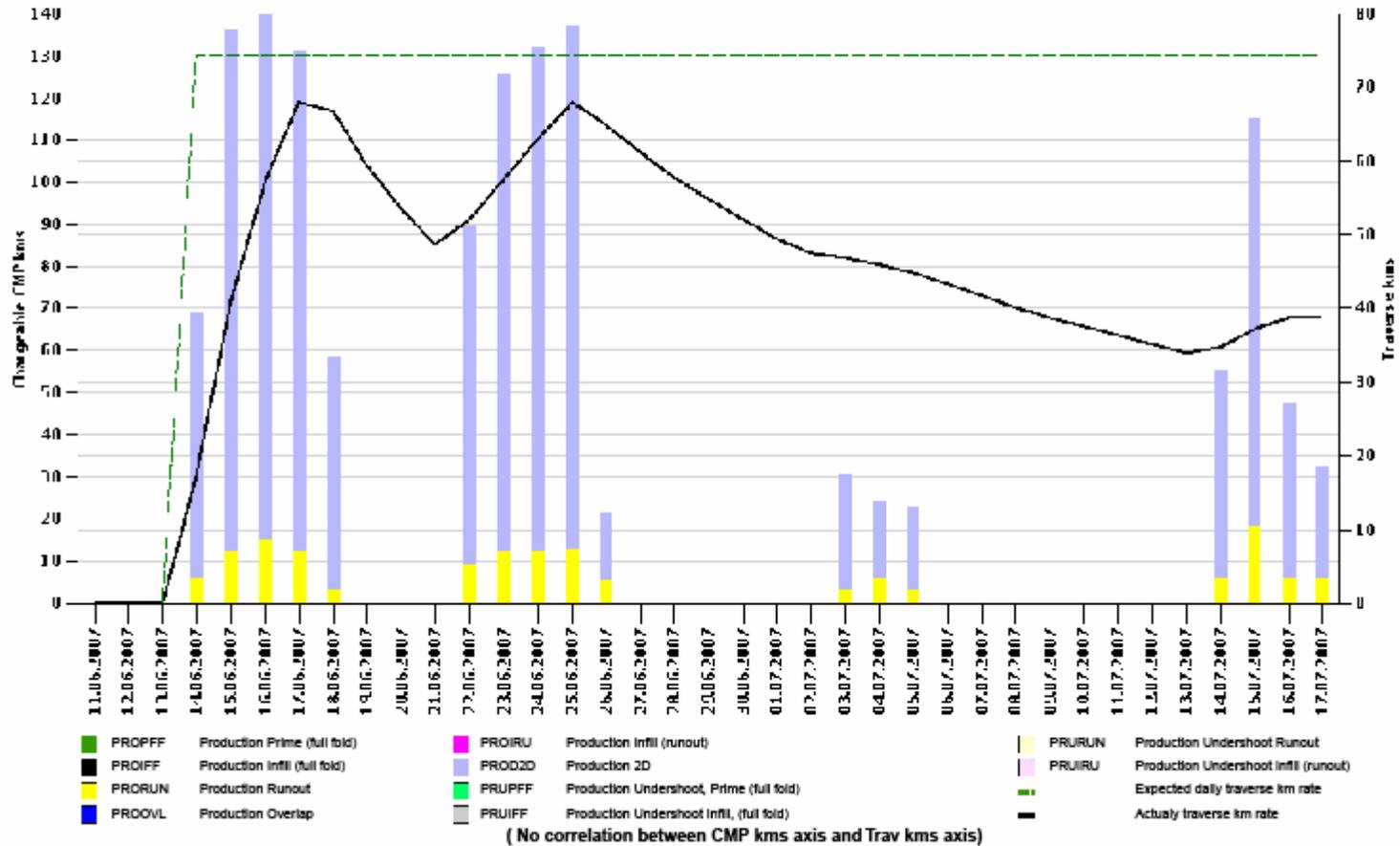
Charge codes in use

- 4 Production Runout
- 8 Production 2D
- 21 Chargeable standby
- Tc CGG Technical Downtime Corrective
- C CGG Time

Production Summary

MV Pacific Titan Client:Nexus Energy Survey: 501 11 70 08 07 00 Area: VIC P49

Date: 11.06.2007 - 17.07.2007



Production Summary

M/V Pacific Titan Client:Nexus Energy Survey: 501 11 70 08 07 00 Area: VIC P49
 Date: 11.06.2007 - 17.07.2007



Chargeable CMP and km² summary

Date	PROFF	PRORUN	PROIFF	PROIRU	PRUPFF	PRURUN	PRUIFF	PRUIRU	PROOVL	PROO2D	Total CMP kms	Total km²
11.06.2007												
12.06.2007												
13.06.2007												
14.06.2007		6.00000								62.67500	68.67500	
15.06.2007		12.00000								124.12500	136.12500	
16.06.2007		15.00000								124.97500	139.97500	
17.06.2007		12.00000								118.87500	130.87500	
18.06.2007		3.00000								55.45000	58.45000	
19.06.2007												
20.06.2007												
21.06.2007												
22.06.2007		9.00000								80.12500	89.12500	
23.06.2007		12.00000								113.85000	125.85000	
24.06.2007		12.00000								119.85000	131.85000	
25.06.2007		12.60000								124.50000	137.10000	
26.06.2007		5.40000								15.70000	21.10000	
27.06.2007												
28.06.2007												
29.06.2007												
30.06.2007												
01.07.2007												
02.07.2007												
03.07.2007		3.00000								27.55000	30.55000	
04.07.2007		6.00000								18.40000	24.40000	
05.07.2007		3.00000								19.42500	22.42500	
06.07.2007												
07.07.2007												
08.07.2007												
09.07.2007												
10.07.2007												
11.07.2007												
12.07.2007												
13.07.2007												
14.07.2007		6.00000								49.22500	55.22500	
15.07.2007		18.00000								96.87500	114.87500	
16.07.2007		6.00000								41.32500	47.32500	

Production Summary

M/V Pacific Titan Client:Nexus Energy Survey: 501 11 70 08 07 00 Area: VIC P49

Date: 11.08.2007 - 17.07.2007



17.07.2007		6.00000							26.47500	32.47500	
Total CMP		147.00000							1219.40000	1366.40000	
Total Km²											

■ PROFF	Production Prime (full fold)	■ PROIRU	Production Infill (runout)	■ PRURUN	Production Undershoot Runout
■ PROIFF	Production Infill (full fold)	■ PROD2D	Production 2D	■ PRUIRU	Production Undershoot Infill (runout)
■ PRORUN	Production Runout	■ PRUPFF	Production Undershoot, Prime (full fold)		
■ PROOVL	Production Overlap	■ PRUIFF	Production Undershoot Infill, (full fold)		

4.3. Daily Summary

4.3.1. Deep water

Daily Operational Comments.

M/V Pacific Titan **Client:**Nexus Energy **Survey:** 501 11 70 06 07 00 **Area:** VIC P49
Date: 11.06.2007 - 17.07.2007

Tue, 17 Jul 2007, week 29

Seq #57 and #58 are re-shoots of Seq #53 and #54 due to an air leak.
Seq#58 feather angle is greater than 10° for the majority of the line due to currents in the area.
On completion of Seq#58, End of survey instrument tests were performed and the in sea equipment recovered.

Vessel then departed for Eden to disembarked clients, data, received supplies, and clear out of the country.

Pilot Boarded at 21:30, due to the wind conditions vessel had to wait for a tug before berthing.

Vessel secured alongside Eden at 23:45.

Midnight fuel balance 699.435 cubic M, Consumed 13.8 cubic M

chase vessel balance 2.7 cubic M, Consumed 0.300 cubic M (updated total - arrived Lakes entrance at 00:00 on 16th July 07)

—

HSE Activity

Total personnel onboard: 33

8 Toolbox meetings (guns recovery and deployment)

1 x drill or training (SOPEP)

0 x cross audits or inspections

1 x Observation card

0 x Meetings

0 x safety induction

Mon, 16 Jul 2007, week 29

A poor day's production due to a air leak that went undetected part way through Seq#53. The air leak was not discovered until approximately 12km into Seq#55.

Pressure remained in Spec throughout the period, but was lower at the nominal 1950 psi at times.

This is being discussed onboard to see how this went undetected, and what can be done to ensure this does not happen again.

Lady Roula departed late in the evening so she could make it to port through high tide.

Midnight fuel balance 713.235 cubic M, Consumed 15.090 cubic M

chase vessel balance 3.0 cubic M, Consumed 0.300 cubic M (nominal 0.3cubic M used as cannot contact Lady Roula)

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

8 Toolbox meetings (guns recovery and deployment)

0 x drill or training

0 x cross audits or inspections

4 x Observation card

0 x Meetings

0 x safety induction

2 x OFI (I.T and PPE)

1 x NC (Disabling RT switch whilst online)

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Sun, 15 Jul 2007, week 29

A goods day's production achieved.

As seen yesterday, currents affected the BSP and feather angles 10° and over are evident on segments of lines.

Swell noise was evident today but at an acceptable limit to leave the streamer at the nominal 7m.

As seen throughout the survey, the echo sounder data has been intermittent.

Midnight fuel balance 728.325 cubic M, Consumed 15.41 cubic M

chase vessel balance 3.3 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

3 x Observation card

1 x Meetings (General meeting)

0 x safety induction

Sat, 14 Jul 2007, week 28

Streamer stayed at 9m for the Bronze Whaler area due to the sea conditions.

On completion of Seq#50 seen the Bronze Whaler survey concluded. Vessel then returned to the Nexus Deep water survey.

First line on the Deep water prospect was shut down part way through due to missing 14 consecutive shots.

This is due to network problems the vessel had during the day. I.T. support requested the switch be disconnected / reconnected. Problem is the real time network was on the switch that was disconnected.

Streamer was gradually put back to the nominal 7m as the sea conditions improved later in the day.

Due to sea currents feather angles of greater than 10° are now evident on the deep water prospect.

Midnight fuel balance 743.735 cubic M, Consumed 18.69 cubic M

chase vessel balance 3.6 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

5 x Observation card

0 x Meetings

0 x safety induction

1 x NC (Virus def. not updating)

Fri, 13 Jul 2007, week 28

A steady days production through marginal weather conditions for the majority of the day.

Seq#44 onwards, the streamer was set to 9m due to the swell noise on the streamer.

Midnight fuel balance 762.425 cubic M, Consumed 19.67 cubic M

chase vessel balance 3.9 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

1 x Observation card

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0 x Meetings
0 x safety induction
1 x NC (Server backup not working since crew change)

Thu, 12 Jul 2007, week 28

A good day's production had throughout the day.
Sea conditions remained favorable for the area and the forecast over the next few days looks OK.
As seen throughout the survey, the echo sounder data has been intermittent
Seq# 36 was streamer was set to 8m due to the swell noise on the streamer.
Midnight fuel balance 782.095 cubic M, Consumed 19.38 cubic M
chase vessel balance 4,2 cubic M, Consumed 0.300 cubic M

—

HSE Activity
Total personnel onboard: 33 and 3 on chase vessel
6 Toolbox meetings
1 x drill or training (abandon ship and pyrotechnics talk)
0 x cross audits or inspections
1 x Observation card
0 x Meetings
0 x safety induction

Wed, 11 Jul 2007, week 28

On completion of Seq 28, the whale watcher noticed whales to the west over by our next proposed line, therefore decided to do a line over to the east. Once on Seq 29 it was shut down part way through due to a sperm whale sighting within the 3km radius.
This was the only shut down for the day, and generally a steady days's production was had.
Seq 33 acquired at 9m streamer depth due to swell noise on the streamer.
Echo sounder data is of poor quality through partial segments of some lines acquired today
Midnight fuel balance 801.475 cubic M, Consumed 19.39 cubic M
chase vessel balance 4,5 cubic M, Consumed 0.300 cubic M

—

HSE Activity
Total personnel onboard: 33 and 3 on chase vessel
6 Toolbox meetings
0 x drill or training
0 x cross audits or inspections
1 x Observation card
0 x Meetings
0 x safety induction
Version 2. First version failed to send.

Tue, 10 Jul 2007, week 28

First line attempted today was shut down for a sperm whale in the restricted area.
After circling the vessel remained in steady production for the remainder of the day. 2 further whale sighting seen, but all out of the 3000m restricted area.
Weather conditions also improved throughout the day and the forecast looks promising for at least the next 5 days.
Midnight fuel balance 820.865 cubic M, Consumed 18.950 cubic M
chase vessel balance 4,8 cubic M, Consumed 0.200 cubic M

—

HSE Activity
Total personnel onboard: 33 and 3 on chase vessel
6 Toolbox meetings
0 x drill or training
0 x cross audits or inspections
7 x Observation card
0 x Meetings

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0 x safety induction
3 x OFI (all I.T. related)

Mon, 09 Jul 2007, week 28

During the weather downtime period today the streamer had to be recovered to bird 12 due to the bird showing erratic depths. The bird was exchanged due to missing 1 wing.

After the streamer was back in position, the door and the guns were deployed.

First line acquired today had a streamer depth of 9m due to the sea conditions. The next 2 lines had an 8m streamer depth and the last line for the day had the streamer back at the nominal depth of 7m.

Seq#18 was a re shoot of previous Seq #15 which was shut down due to whale sighting

Midnight fuel balance 839.815 cubic M, Consumed 11.4 cubic M

chase vessel balance 5.0 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

9 Toolbox meetings (1 x Door handling, 1 x gun deployment, 1 x streamer operations)

0 x drill or training

0 x cross audits or inspections

0 x Observation card

3 x Meetings (department on 8th July)

0 x safety induction

Sun, 08 Jul 2007, week 28

Due to the quick increase in sea condition today, only one line was attempted. VGNXS07-22-015 was scratched due to a sperm whale sighting part way down the line.

Guns and door recovered once vessel was down for weather.

Vessel race tracked along the prospect for the remainder of the day waiting for the weather to ease.

Midnight fuel balance 851.215 cubic M, Consumed 16.581 cubic M

chase vessel balance 5.3 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

8 Toolbox meetings (1 x Door handling, 1 x gun recovery)

0 x drill or training

0 x cross audits or inspections

0 x Observation card

1 x Meetings (SCM)

0 x safety induction

Sat, 07 Jul 2007, week 27

After VGNXS07-20-008 was completed the vessel continued heading south to allow sufficient run in for line VGNXS07-10. Whilst on the line change vessel Iron Chieftain would not respond to any calls. This made our vessel alter course to protect the trailing equipment and vessel. Once the Chieftain was clear it was decided to go for line VGNXS07-07-009 due to our current position.

Line VGNXS07-10-014 was terminated on the run out due to obstruction Crystal Ocean. Vessel started to slowly deviated offline with 120shots to go before Last pre plot position. Feather angle was slightly to port (2deg approx) before deviation commenced.

Vessel or Streamer did not enter the exclusion zone (500m).

Echo sounder data poor for portions of Seq 11, 12 and 13.

Midnight fuel balance 867.796 cubic M, Consumed 19.992 cubic M

chase vessel balance 5.6 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

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6 Toolbox meetings
0 x drill or training
0 x cross audits or inspections
0 x Observation card
0 x Meetings
0 x safety induction
1 x incident (NEM due to Iron chieftain not responding to our calls)
Version 2: Version 1 did not send. Resending log.

Fri, 06 Jul 2007, week 27

The day started in possible shooting conditions but it was deemed to unsafe to deploy the deflector due to a heavy swell. Once the sea conditions improved the deflector was deployed followed by the guns.

On the run in to VGNXS07-12-003 a sperm whale was sighted which required the source to be shut down.

The vessel circled and commenced VGNXS07-12-003 on the next attempt.

Steady production followed for the remainder of the day

Chase vessel Lady Roula remained on prospect throughout the day.

Midnight fuel balance 887.788 cubic M, Consumed 14.062 cubic M

chase vessel balance 5.9 cubic M, Consumed 0.400 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

8 Toolbox meetings (1 x Door handling, 1 x gun recovery)

0 x drill or training

0 x cross audits or inspections

0 x Observation card

0 x Meetings

0 x safety induction

Thu, 05 Jul 2007, week 27

Seq 42 was completed with no problems today.

During the line change a email arrived stating Nexus would like to commence the Bronze Whaler area immediately.

Run in was aborted for Seq 43 and the vessel proceeded directly for Bronze whaler area. Little if any time was lost due to the proximity of the Bronze whaler area.

Production started successfully on Bronze whaler area. Seq 2 the streamer depth commenced at 7m but increased to 8m and then 9m during the line as the sea conditions increased.

At the end of Seq 2 the vessel went on weather standby for the remainder of the day. Guns and door were recovered.

Weather at midnight: Swell from the E @ 4 to 5m and a secondary swell from the SW @ 2m.

Wind 6knots from the East.

Chase vessel on location at 19:00.

Midnight fuel balance 901.85 cubic M, Consumed 15.054 cubic M

chase vessel balance 6.3 cubic M, Consumed 0.700 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

8 Toolbox meetings (1 x Door handling, 1 x gun recovery)

1 x drill or training (General muster, Don BA sets and test fire hoses)

0 x cross audits or inspections

0 x Observation card

0 x Meetings

0 x safety induction

Version 2: SOL-ID saying log not sent.

Version 3: Forcing New survey

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Wed, 04 Jul 2007, week 27

Ships noise was evident for parts of Seq 40 and 41 today.

Echo sounder depth readings have been unstable for all lines today.

Approximately 1\2 down seq 41, the wind had increased to 40knots as a low front was immanent. Vessel steerage and guns depth control was slightly erratic during this period but was accepted by the client

Guns and door were recovered at the end of line as Gale force warning was out for our area.

When the front passed the seas dropped of rapidly and door and guns were re deployed.

Vessel is currently heading for line VGNXS07-73 which is due to start just after midnight.

Chase vessel remained in port. The weather windows are currently to short on prospect to bring the chase vessel out.

Midnight fuel balance 916.904 cubic M, Consumed 13.286 cubic M

chase vessel balance 7 cubic M, Consumed 0.000 cubic M

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

10 Toolbox meetings (2 x Door handling, 1 x gun recovery, 1 x gun deployment)

0 x drill or training

0 x cross audits or inspections

1 x Observation card

0 x Meetings

0 x safety induction

1 x NC (Argus failing)

Tue, 03 Jul 2007, week 27

Seq 38 was terminated due to erratic cable control because of inclement weather conditions at the time.

Vessel proceeded for a line in the opposite heading, but the run in was aborted due to loss of streamer control.

Vessel turned fair sea's, recovered the guns and deflector.

Late in the day the weather started to abate, all gear was deployed and production commenced on Seq 39.

Vessel remained in production past midnight.

Echo sounder is reading incorrect depths for all line today.

A front is due tomorrow with gust of up to 50knots forecasted.

Chase vessel remained in Eden as the weather window is short and winds of up to 50knots are expected within the next 24 hours.

Midnight fuel balance 930.19 cubic M, Consumed 11.827 cubic M

chase vessel balance 7 cubic M, Consumed 0.000 cubic M

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel (New Steward arrived, Observer departed vessel for a medical appointment later in month)

10 Toolbox meetings (2 x Door handling, 1 x gun recovery, 1 x gun deployment)

0 x drill or training

0 x cross audits or inspections

0 x Observation card

0 x Meetings

0 x safety induction

Mon, 02 Jul 2007, week 27

Vessel departed for the prospect area as the weather was starting to improve on the prospect. Once all equipment was deployed the vessel waited until daylight for the MMO to commence observations.

During this time the Argus had failed and the recording system had to be reconfigured to enable direct recording to the tape drives.

Wind conditions also increased at first daylight to around 35 knots with gust up to 45knots.

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The first line commenced with a streamer depth of 7m but part way through it was increased to 8m. Swell noise was at an acceptable limit but cable control was unstable. Due to the cable control being erratic the line ended up been terminated just after midnight. Lady Roula remained in port due to the weather out on the prospect area. Midnight fuel balance 942.017 cubic M, Consumed 7,902 cubic M chase vessel balance 7 cubic M, Consumed 0.000 cubic M received 2.7

—
HSE Activity

Total personnel onboard: 33 and 3 on chase vessel (New Steward arrived, Observer departed vessel for a medical appointment later in month)
8 Toolbox meetings (streamer and gun deployment)
0 x drill or training
0 x cross audits or inspections
1 x Observation card
0 x Meetings
0 x safety induction

Sun, 01 Jul 2007, week 27

Vessel remained in port due to the inclement weather on the prospect.
ETD is 04:00 tomorrow for the prospect.
Chase Vessel Lady Roula has a suspect water pump that requires repairs before she sails.
Midnight fuel balance 949.919 cubic M, Consumed 1 cubic M
chase vessel balance 4.3 cubic M, Consumed 0.000 cubic M

—
HSE Activity

Total personnel onboard: 33 and 3 on chase vessel (Steward departed vessel for personal reason, replacement arriving tomorrow)
6 Toolbox meetings
0 x drill or training
0 x cross audits or inspections
0 x Observation card
0 x Meetings
0 x safety induction
1 x FAC (deck officer with flue went to hospital for check up)

Sat, 30 Jun 2007, week 26

Vessel remained in port due to the inclement weather on the prospect.
Plan is to sail tomorrow for the prospect as the weather forecast is predicting a 24 to 48 hour window of fair weather before another low front arrives.
Midnight fuel balance 950.919 cubic M, Consumed 1 cubic M
chase vessel balance 4.3 cubic M, Consumed 0.000 cubic M

—
HSE Activity

Total personnel onboard: 34 and 3 on chase vessel
6 Toolbox meetings
0 x drill or training
0 x cross audits or inspections
0 x Observation card
0 x Meetings
0 x safety induction

Fri, 29 Jun 2007, week 26

Vessel remained in port due to the inclement weather on the prospect.
At this stage it is planned for at least another 36hours alongside.
Midnight fuel balance 951.919 cubic M, Consumed 2.4 cubic M
chase vessel balance 4.3 cubic M, Consumed 0.000 cubic M

—
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HSE Activity

Total personnel onboard: 34 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

0 x Observation card

0 x Meetings

0 x safety induction

Thu, 28 Jun 2007, week 26

Vessel remained in port due to the inclement weather on the prospect.

At this stage it is planned for at least another 24hours alongside.

Midnight fuel balance 954.319 cubic M, Consumed .912 cubic M

chase vessel balance 4.3 cubic M, Consumed 0.000 cubic M

HSE Activity

Total personnel onboard: 34 and 3 on chase vessel

6 Toolbox meetings

1 x drill or training

0 x cross audits or inspections

1 x Observation card

0 x Meetings

3 x safety induction

Version 2: Due to not sending first time

Wed, 27 Jun 2007, week 26

After the crew change was completed the vessel remained in port due to inclement weather on the prospect.

The time alongside is being utilized by maritime for repairs to the vessel which was caused on the transit into Eden for crew change.

Work is also being carried out on a fuel pump that failed onboard.

Chase vessel is waiting for a replacement fuel pump.

Midnight fuel balance 955.231 cubic M, Consumed 7.659 cubic M Received 197.972

chase vessel balance 4.3 cubic M, Consumed 0.000 cubic M

HSE Activity

Total personnel onboard: 34 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

0 x Observation card

0 x Meetings

0 x safety induction 1 x seismic induction

Version 2: Fuel received and consumed changed slightly

Tue, 26 Jun 2007, week 26

In production until 03:50 GMT and then we began the retrieval of gear to transit for crew change.

All gear onboard at 07:01 GMT and we are transiting to Eden. Alongside at midnight GMT. We had one incident of a rogue wave hitting the vessel causing some damage to starboard side.

Midnight fuel balance 764.918 cubic M, Consumed 13.544 cubic M

chase vessel balance 4.3 cubic M, Consumed 0.900 cubic M

HSE Activity

Total personnel onboard: 37 and 3 on chase vessel

10 Toolbox meetings (6 shift change, 2 x retrieval of guns, 1 x deploy guns, 1 x retrieval of streamer)

1 x incident (Rogue wave hit starboard side damaging the stairs and storm door to gun deck)

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0 x drill or training
0 x cross audits or inspections
0 x Observation card
0 x Meetings
0 x safety induction
3 x New Action points added to RAP list (1 added on the 20th, 2 added on the 21st)
2 x Action points completed (these were closed out on the 21st of June)

Mon, 25 Jun 2007, week 26

Good production day. There is a long swell still running of up to 1.5 meters. Some surface current noise on seq 34

The weather now looks like it will be very bad just after crew change.

Midnight fuel balance 778.462 cubic M, Consumed 12.775 cubic M

chase vessel balance 5.2 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 37 and 3 on chase vessel

6 Toolbox meetings (6 shift change)

0 x incident

0 x drill or training

0 x cross audits or inspections

0 x Observation card

0 x Meetings

0 x safety induction

ver2 changed run out time on seq 35

Sun, 24 Jun 2007, week 26

Good production day. Wind has abated to 5 kts but there is a long swell still running of up to 2 meters. Some gun spread errors during seq 28 and 29.

The weather now looks like it will hold until when we pick for crew change.

Midnight fuel balance 791.237 cubic M, Consumed 13.700 cubic M

chase vessel balance 5.5 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 37 and 3 on chase vessel

6 Toolbox meetings (6 shift change)

0 x incident

1 x drill or training

0 x cross audits or inspections

1 x Observation card

0 x Meetings

0 x safety induction

Sat, 23 Jun 2007, week 25

Good production day. Wind has abated to 5 kts but there is a long swell still running of up to 2 meters.

The weather now looks like it will hold until when we pick for crew change.

Midnight fuel balance 804.937 cubic M, Consumed 13.957 cubic M

chase vessel balance 5.8 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 37 and 3 on chase vessel

6 Toolbox meetings (6 shift change)

0 x incident

0 x drill or training

0 x cross audits or inspections

5 x Observation card

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0 x Meetings
0 x safety induction

Fri, 22 Jun 2007, week 25

Started the day off with continued standby for weather. The streamer was deployed late last night and the deflector and guns were deployed starting around 5:30 GMT.

The swell and seas slowly decreased allowing our production to recommence at 10:07 GMT with the streamer set to 9m. We finished off line VGNX07-52 which was cut short by bad weather on Monday. We then continued on with production, bringing the streamer up to 8 and 7 meters on sequences 21 and 22 respectively. Wind has abated to 14 kts but there is a long swell of up to 2 meters. Weather expected to remain shootable until Monday. Midnight fuel balance 818.894 cubic M, Consumed 9.97 cubic M
chase vessel balance 6.1 cubic M, Consumed 0.900 cubic M

—
HSE Activity

Total personnel onboard: 37 and 3 on chase vessel
8 Toolbox meetings (6 shift change handovers, 1 x gun deploy, 1 x door deployment)
0 x incident
0 x drill or training
0 x cross audits or inspections
0 x Observation card
0 x Meetings
0 x safety induction

Thu, 21 Jun 2007, week 25

Currently standing by for weather with 5 plus meter seas. Slowly decreasing.
We deployed the streamer but could not deploy the deflector door due to increasing wind and swell which blew up after streamer deployment.

Midnight fuel balance 828.864 cubic M, Consumed 9.8 cubic M
chase vessel balance 7 cubic M, Consumed 0.000 cubic M bunkered 2.6 cu. M to fill tanks while in port for weather

—
HSE Activity

Total personnel onboard: 37 and 3 on chase vessel
8 Toolbox meetings (6 shift change handovers, 1 x streamer deploy, 1 x door deployment)
0 x incident
6 x drill or training
0 x cross audits or inspections
2 x Observation card
1 x Meetings
0 x safety induction
vers2 due to fuel figure correction on chase vessel

Wed, 20 Jun 2007, week 25

Currently standing by for weather with 7 plus meter seas.
We expect possibly to deploy the gear in the early hours of tomorrow local time and have soft start around 0800.

Midnight fuel balance 838.664 cubic M, Consumed 9.796 cubic M
chase vessel balance 4.4 cubic M, Consumed 0.000 cubic M

—
HSE Activity

Total personnel onboard: 37 and 3 on chase vessel
6 Toolbox meetings (6 shift change handovers)
0 x incident
0 x drill or training
0 x cross audits or inspections
7 x Observation card

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0 x Meetings
0 x safety induction
ver3 corrected fuel figures for chase vessel

Tue, 19 Jun 2007, week 25

Currently standing by for weather with 6 plus meter seas.
We expect possibly to deploy the gear in the early hours of tomorrow local time.
Midnight fuel balance 848.460 cubic M, Consumed 11.223 cubic M
chase vessel balance 4.4 cubic M, Consumed 1.100 cubic M (used to steam to Port Welshpool)

—
HSE Activity

Total personnel onboard: 37 and 3 on chase vessel
6 Toolbox meetings (6 shift change handovers)
0 x incident
0 x drill or training
0 x cross audits or inspections
12 x Observation card
0 x Meetings
0 x safety induction
vers2 due to change in chase vessel fuel usage. They were out of range when first daily was sent.

Mon, 18 Jun 2007, week 25

Production was good for the first part of the day and then the weather increased to above 30 kts steady winds creating large choppy swell conditions.
The decision was made to retrieve the gear as the forecast shows increasing winds and swell over the next two days.
Currently standing by for weather with 6 plus meter seas.
We expect 24 hours or more weather standby in the next day or so.
Midnight fuel balance 859.683 cubic M, Consumed 13.275 cubic M
chase vessel balance 5.2 cubic M, Consumed 0.300 cubic M

—
HSE Activity

Total personnel onboard: 37 and 3 on chase vessel
9 Toolbox meetings (6 shift change handovers, 2 for deploy and retrieve gun arrays, 1 for streamer retrieval)
0 x incident
0 x drill or training
0 x cross audits or inspections
5 x Observation card
0 x Meetings
0 x safety induction

Sun, 17 Jun 2007, week 25

A good day of production with 130 km.
One circle due to array hardware.
Weather deteriorating quickly. The chase vessel has been released to take what ever action they wish.
We expect 24 hours or more weather standby in the next day or so.
Midnight fuel balance 872.958 cubic M, Consumed 14.134 cubic M
chase vessel balance 5.5 cubic M, Consumed 0.300 cubic M

—
HSE Activity

Total personnel onboard: 37 and 3 on chase vessel
11 Toolbox meetings (6 shift change handovers, 1 for FRC launch, 4 for deploy and retrieve gun arrays))
0 x incident
2 x drill or training (muster drill, survival suits, fire hose deploy and test)

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0 x cross audits or inspections
2 x Observation card
1 x Meetings (General all crew safety meeting)
0 x safety induction
1 x work boat deployment for TS dip and training.
1 x MSV
3 x cross audits

Sat, 16 Jun 2007, week 24

A good day of solid productivity with 140 km.

No problems today. We are starting to shoot on the East west lines due to these are more likely to be affected by bad weather.

Weather remains good today but will deteriorate badly starting Monday evening and lasting more than 24 hours.

A TS dip was taken today.

Midnight fuel balance 887.092 cubic M, Consumed 14.031 cubic M

chase vessel balance 5.8 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 37 and 3 on chase vessel

6 Toolbox meetings (6 shift change handovers)

0 x incident

2 x drill or training (Richard held two training sessions with Medic)

0 x cross audits or inspections

1 x Observation card

0 x Meetings

0 x safety induction

Fri, 15 Jun 2007, week 24

We started production at 2:13 GMT and have had a good day of solid productivity with over 133 km.

No problems today other than one missed SP and two bad SPs due to early closures.

Weather remains fairly good with the same outlook for the next few days.

Midnight fuel balance 901.123 cubic M, Consumed 14.300 cubic M

chase vessel balance 6.1 cubic M, Consumed 0.300 cubic M

HSE Activity

Total personnel onboard: 37 and 3 on chase vessel

8 Toolbox meetings (6 shift change handovers, 1 x gun retrieval, 1 x gun deployment)

0 x incident

0 x drill or training

0 x cross audits or inspections

0 x Observation card

0 x Meetings

0 x safety induction

vers2 Due to mistake in last full fold SP on seq 6

Thu, 14 Jun 2007, week 24

We deployed and started production today. The chase vessel, Lady Roula has joined us now.

We are shooting the Deep water prospect North-South lines. We have had two technical downtime circles today,

one due to an air leak on the gun arrays and one due to a compressor valve.

Weather remains "shoot able" with the same outlook for the next few days.

Midnight fuel balance 915.423 cubic M, Consumed 14.276 cubic M

chase vessel balance 6.4 cubic M, Consumed 0.600 cubic M

HSE Activity

Nexus Energy Ltd

Total personnel onboard: 37 and 3 on chase vessel
8 Toolbox meetings (6 shift change handovers, 1 x gun retrieval, 1 x gun deployment)
0 x incident
0 x drill or training
0 x cross audits or inspections
0 x Observation card
0 x Meetings
0 x safety induction

Wed, 13 Jun 2007, week 24

We were down for weather until 19:35 GMT. Started to deploy streamer thereafter. The wind has dropped from 35 to 20-25 kts. Expecting it to get better as the day goes on.
Hopes are to start production before dark. The chase vessel, Lady Roula has been called and left port just after midnight GMT.

Midnight fuel balance 929.699 cubic M, Consumed 12.127 cubic M

—
HSE Activity

Total personnel onboard: 37
8 Toolbox meetings (6 shift change handovers, 1 x streamer deployment, 1 x fuse panel test on bridge)
0 x incident
0 x drill or training
0 x cross audits or inspections
2 x Observation card
0 x Meetings
0 x safety induction
ver2 chaged fuel figures

Tue, 12 Jun 2007, week 24

Finished transit to Eden, Australia.

Alongside until 08:00 GMT. Steamed to prospect area. Once on location weather picked up to 35-40 kts with 4m choppy seas. Too rough to deploy gear so we turned back northeast for some hours down for weather. Conditions may improve over the night and possibly we can deploy gear in the morning of the 14th local time.

Midnight fuel balance 941.826 cubic M, Consumed 9.656 cubic M

—
HSE Activity

Total personnel onboard: 37
6 Toolbox meetings (6 shift change handovers)
0 x incident
0 x drill or training (training in risk assessment)
0 x cross audits or inspections
0 x Observation card
0 x Meetings
0 x safety induction

Mon, 11 Jun 2007, week 24

Finished transit to Eden, Australia.

Alongside at 00:06 GMT. Once alongside we start the mobilisation time for Nexus and have startup meetings in the morning local time.

Some rebuilding of water cooling pump equipment performed in Engine room during the stay.

Midnight fuel balance 951.482 cubic M, Consumed 6.187 cubic M

—
HSE Activity

Total personnel onboard: 37
6 Toolbox meetings (6 shift change handovers)
1 x incident (FAC for cut finger)

Nexus Energy Ltd

0 x drill or training (training in risk assessment)
0 x cross audits or inspections
1 x Observation card
2 x Meetings (Nexus startup meetings)
 0 x safety induction

4.3.2. Bronze Whaler

Daily Operational Comments.

M/V Pacific Titan **Client:**Nexus Energy **Survey:** 501 11 70 06 07 01 **Area:** VICP49
Date: 05.07.2007 - 14.07.2007

Sat, 14 Jul 2007, week 28

Streamer stayed at 9m for the Bronze Whaler area due to the sea conditions.

On completion of Seq#50 seen the Bronze Whaler survey concluded. Vessel then returned to the Nexus Deep water survey.

First line on the Deep water prospect was shut down part way through due to missing 14 consecutive shots.

This is due to network problems the vessel had during the day. I.T. support requested the switch be disconnected / reconnected. Problem is the real time network was on the switch that was disconnected.

Streamer was gradually put back to the nominal 7m as the sea conditions improved later in the day.

Due to sea currents feather angles of greater than 10° are now evident on the deep water prospect.

Midnight fuel balance 743.735 cubic M, Consumed 18.69 cubic M

chase vessel balance 3.6 cubic M, Consumed 0.300 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

5 x Observation card

0 x Meetings

0 x safety induction

1 x NC (Virus def. not updating)

Fri, 13 Jul 2007, week 28

A steady days production through marginal weather conditions for the majority of the day.

Seq#44 onwards, the streamer was set to 9m due to the swell noise on the streamer.

Midnight fuel balance 762.425 cubic M, Consumed 19.67 cubic M

chase vessel balance 3.9 cubic M, Consumed 0.300 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

1 x Observation card

0 x Meetings

0 x safety induction

Nexus Energy Ltd

1 x NC (Server backup not working since crew change)

Thu, 12 Jul 2007, week 28

A good day's production had throughout the day.

Sea conditions remained favorable for the area and the forecast over the next few days looks OK.

As seen throughout the survey, the echo sounder data has been intermittent

Seq# 36 was streamer was set to 8m due to the swell noise on the streamer.

Midnight fuel balance 782.095 cubic M, Consumed 19.38 cubic M

chase vessel balance 4,2 cubic M, Consumed 0.300 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

6 Toolbox meetings

1 x drill or training (abandon ship and pyrotechnics talk)

0 x cross audits or inspections

1 x Observation card

0 x Meetings

0 x safety induction

Wed, 11 Jul 2007, week 28

On completion of Seq 28, the whale watcher noticed whales to the west over by our next proposed line, therefore decided to do a line over to the east. Once on Seq 29 it was shut down part way through due to a sperm whale sighting within the 3km radius.

This was the only shut down for the day, and generally a steady days's production was had.

Seq 33 acquired at 9m streamer depth due to swell noise on the streamer.

Echo sounder data is of poor quality through partial segments of some lines acquired today

Midnight fuel balance 801.475 cubic M, Consumed 19.39 cubic M

chase vessel balance 4,5 cubic M, Consumed 0.300 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

1 x Observation card

0 x Meetings

0 x safety induction

Version 2. First version failed to send.

Tue, 10 Jul 2007, week 28

First line attempted today was shut down for a sperm whale in the restricted area.

After circling the vessel remained in steady production for the remainder of the day. 2 further whale sighting seen, but all out of the 3000m restricted area.

Weather conditions also improved throughout the day and the forecast looks promising for at least the next 5 days.

Midnight fuel balance 820.865 cubic M, Consumed 18.950 cubic M

chase vessel balance 4,8 cubic M, Consumed 0.200 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

7 x Observation card

0 x Meetings

0 x safety induction

3 x OFI (all I.T. related)

Nexus Energy Ltd

Mon, 09 Jul 2007, week 28

During the weather downtime period today the streamer had to be recovered to bird 12 due to the bird showing erratic depths. The bird was exchanged due to missing 1 wing.

After the streamer was back in position, the door and the guns were deployed.

First line acquired today had a streamer depth of 9m due to the sea conditions. The next 2 lines had an 8m streamer depth and the last line for the day had the streamer back at the nominal depth of 7m.

Seq#18 was a re shoot of previous Seq #15 which was shut down due to whale sighting

Midnight fuel balance 839.815 cubic M, Consumed 11.4 cubic M

chase vessel balance 5.0 cubic M, Consumed 0.300 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

9 Toolbox meetings (1 x Door handling, 1 x gun deployment, 1 x streamer operations)

0 x drill or training

0 x cross audits or inspections

0 x Observation card

3 x Meetings (department on 8th July)

0 x safety induction

Sun, 08 Jul 2007, week 28

Due to the quick increase in sea condition today, only one line was attempted. VGNXS07-22-015 was scratched due to a sperm whale sighting part way down the line.

Guns and door recovered once vessel was down for weather.

Vessel race tracked along the prospect for the remainder of the day waiting for the weather to ease.

Midnight fuel balance 851.215 cubic M, Consumed 16.581 cubic M

chase vessel balance 5.3 cubic M, Consumed 0.300 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

8 Toolbox meetings (1 x Door handling, 1 x gun recovery)

0 x drill or training

0 x cross audits or inspections

0 x Observation card

1 x Meetings (SCM)

0 x safety induction

Sat, 07 Jul 2007, week 27

After VGNXS07-20-008 was completed the vessel continued heading south to allow sufficient run in for line VGNXS07-10. Whilst on the line change vessel Iron Chieftain would not respond to any calls. This made our vessel alter course to protect the trailing equipment and vessel. Once the Chieftain was clear it was decided to go for line VGNXS07-07-009 due to our current position.

Line VGNXS07-10-014 was terminated on the run out due to obstruction Crystal Ocean. Vessel started to slowly deviated offline with 120shots to go before Last pre plot position. Feather angle was slightly to port (2deg approx) before deviation commenced.

Vessel or Streamer did not enter the exclusion zone (500m).

Echo sounder data poor for portions of Seq 11, 12 and 13.

Midnight fuel balance 867.796 cubic M, Consumed 19.992 cubic M

chase vessel balance 5.6 cubic M, Consumed 0.300 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

6 Toolbox meetings

0 x drill or training

0 x cross audits or inspections

0 x Observation card

Nexus Energy Ltd

0 x Meetings
0 x safety induction
1 x incident (NEM due to Iron chieftain not responding to our calls)
Version 2: Version 1 did not send. Resending log.

Fri, 06 Jul 2007, week 27

The day started in possible shooting conditions but it was deemed to unsafe to deploy the deflector due to a heavy swell. Once the sea conditions improved the deflector was deployed followed by the guns.

On the run in to VGNXS07-12-003 a sperm whale was sighted which required the source to be shut down.

The vessel circled and commenced VGNXS07-12-003 on the next attempt.

Steady production followed for the remainder of the day

Chase vessel Lady Roula remained on prospect throughout the day.

Midnight fuel balance 887.788 cubic M, Consumed 14.062 cubic M

chase vessel balance 5.9 cubic M, Consumed 0.400 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

8 Toolbox meetings (1 x Door handling, 1 x gun recovery)

0 x drill or training

0 x cross audits or inspections

0 x Observation card

0 x Meetings

0 x safety induction

Thu, 05 Jul 2007, week 27

Seq 42 was completed with no problems today.

During the line change a email arrived stating Nexus would like to commence the Bronze Whaler area immediately.

Run in was aborted for Seq 43 and the vessel proceeded directly for Bronze whaler area. Little if any time was lost due to the proximity of the Bronze whaler area.

Production started successfully on Bronze whaler area. Seq 2 the streamer depth commenced at 7m but increased to 8m and then 9m during the line as the sea conditions increased.

At the end of Seq 2 the vessel went on weather standby for the remainder of the day. Guns and door were recovered.

Weather at midnight: Swell from the E @ 4 to 5m and a secondary swell from the SW @ 2m.

Wind 6knots from the East.

Chase vessel on location at 19:00.

Midnight fuel balance 901.85 cubic M, Consumed 15.054 cubic M

chase vessel balance 6.3 cubic M, Consumed 0.700 cubic M

—

HSE Activity

Total personnel onboard: 33 and 3 on chase vessel

8 Toolbox meetings (1 x Door handling, 1 x gun recovery)

1 x drill or training (General muster, Don BA sets and test fire hoses)

0 x cross audits or inspections

0 x Observation card

0 x Meetings

0 x safety induction

Version 2: SOL-ID saying log not sent.

Version 3: Forcing New survey

4.4. Field Information and Encountered Problems

4.4.1. Obstructions / Installations in the Field

There is one field obstruction on the prospect. FPSO Crystal Ocean located to the NW corner of the block only affected lines on the Bronze Whaler area. One line ended early as to not enter the exclusion zone of the Crystal Ocean.

4.4.2. Traffic / Shipping Lanes

Commercial traffic levels were at a high level in the prospect area due to survey being located in a shipping lane. 1 line change was extended due to a vessel not responding. Some lines acquired have evidence of ships screw noise.

4.4.3. Fishing Activity

Minimal fishing activity observed during the survey.

4.4.4. Seismic Interference and Time Share

No timesharing for the prospect

4.4.5. Environmental Obstacles

Several low fronts over the period of the survey were evident. In general, sea state was poor for the majority of the survey. If the swell noise was marginal to high at the nominal 7m streamer depth the client representative made the decision to lower the cable to 8 or 9 meters. If quality control could not be maintained at 9m streamer depth the vessel went on stand by until the weather improved.

Two humpback whale and eight sperm whales sighting spotted whilst on the prospect. Vessel had 4 source shut downs due to whales in the restricted boundary of the vessel.

4.4.6. Operational Observations

Poor weather was the major factor for reducing the overall production rate of the vessel. 22.33% Bronze Whaler prospect. 41.92% on the Deepwater prospect.

5. HSE Summary

There were 2 first aid cases during the Nexus Energy Ltd survey.

Prior to the Survey start all new crew members were given a safety introduction tour to get familiarized with the vessel's safety details.

Prior to all safety critical operations, i.e. deploying and recovery of seismic equipment, a "Toolbox Meeting" was held to verify and eliminate any hazards related to the operation.

Each operation has its own dedicated procedures, laid down in the CGGVeritas Intranet system and these were carefully followed throughout the survey.

Overview of the incident during the Pantheon Survey:

FAC: First aid case.

FAC: X 1 Lady Roula 2nd officer with flue.

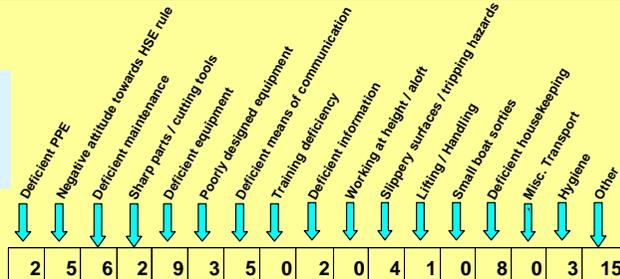
FAC: X 1 Compressor Mechanic cut thumb

34200 man-hours used throughout the survey; this includes 2520 chase vessel man-hours

5.1. Observation Cards during the Survey:

66 observation cards logged during the survey

Safety Observation Card Register



Last update: 25-Jul-07

Card #	Date	Short Description	2	5	6	2	9	3	5	0	2	0	4	1	0	8	0	3	15	Action Taken or Recommendation	Action By	APL
1	11-Jun-07	Missing step at Port loading stage, metal grating missing from step, REF Card 164												X						Found and replaced step, need to made more secure	Ch/Officer	x
2	12-Jun-07	Small cut on thumb whilst installing exhaust gasket				X														Cleaned injury and reported incident, HSE to make aware of common hand injuries within the work place	Hsea	x
3	14-Jun-07	Saltwater ingress into the incinerator area from non water tight vent penetration to deck, causing electrical work hazard					X													Fix leaks at earliest opportunity, Foam placed around flue but water still getting in	Ch/Eng	x
4	14-Jun-07	Canvas protection on fuel vents on the Port side beginning to come off, danger for water ingress														X				Fix at earliest opportunity due to rough weather	Ch/Eng	x
5	17-Jun-07	Engine room is being kept clean and in great condition, thanks to the motorman and engineers																	X	Informed Ch Eng.	Ch/Eng	x
6	17-Jun-07	Crew member wearing shorts to muster drill	X																	Ensure all personnel are wearing correct PPE for all drill and around the vessel	Hsea	x
7	18-Jun-07	Chains at the workboat station net secure					X													Replaced chains	Ch/Eng	x
8	19-Jun-07	At the fire drill, took a number of minutes to receive water pressure to all fire nozzles																	X	Enquire is system can be made to work faster. Posible airlock in system, will check at next fire drill	Ch/Eng	o
9	19-Jun-07	Laundry room, dryer door loose and cloths placed on top of dryer after dried fall behind machines and can cause fire hazard						X												Repair dryer and use correct shelf for storage after use or put another shelf in the room	Ch/Officer	x
10	19-Jun-07	Side of oven exposed, possible danger when cleaning area					X													Replace side of oven	Ch/Officer	x
11	19-Jun-07	A crew member removes meal from the fridge, consumes half and then return dirty plate to fridge																	X	Educate personnel to wash up there plate and do not replace half eaten food to the fridge	Hsea	x
12	19-Jun-07	Towels use in the galley doorway are slippery and can cause a trip/fall hazard.											X							Replace with purpose made anti slip mats for galley areas, Not recommended by Ch Steward	Ch/Officer	x
13	19-Jun-07	Washing machine bracket becoming loose, in extreme weather damage to machine possible					X													Tighten or replace bracket	Ch/Officer	x
14	19-Jun-07	Chairs in TV room are unstable in rough weather						X												Replace with more stable type chairs, rejected	Hsea	x
15	19-Jun-07	Extreme weather warning, why did the Titan still decide to stay in the prospect area after equipment bought onboard																	X	Discuss with Client, Captain, Party Chief, HSE at meeting, Captain responds was that vessel and crew are safe, until situation worsen, we stay in prospect area	Captain	x
16	20-Jun-07	Screen for cctv monitor inop on bridge, OOW unable to see any operation taking place on seismic level					X													Power supply and monitor to be refitted asap, On order by Ch Nav, Replaced screen with small monitor	Ch/Eng	Y
17	20-Jun-07	Cabin D (marine accommodation) Air conditioning vents broken and no towel rail					X													Replace broken parts on the air con and place a new towel rail in cabin	Ch/Officer	x
18	20-Jun-07	When gun recovery was taking place in rough weather, not all gun mech were attached with life lines											X							All personnel to be aware of dangers in working on back deck in rough conditions	Source	x
19	20-Jun-07	Stewards have done a very good job in keeping vessel clean and tidy																	X	Good work	Captain	x
20	20-Jun-07	The cooks have worked very hard and produce some fantastic meals during rough sailing conditions																	X	Congratulations to the cooks	Captain	x
21	20-Jun-07	Large SOPEP box Aft Strd side became loose from its base in rough weather					X													Secured SOPEP box back in its location and reported incident	Source	x
22	20-Jun-07	Small SOPEP box between gun shack and recording room has no sign indicating SOPEP on it							X											Place signs indicating SOPEP on box, Done	Hsea	x
23	20-Jun-07	Engine room, Chain blocks missing safety catch on hook					X													Replace hook on safety catch, Ch Eng will investigate and rectify	Ch/Eng	x
24	20-Jun-07	Engine room, No SWL on general overhead rail or running gear									X									Check if SWL has been completed and place signs up to indicate next inspection date, as above. See comment SCM#20	Ch/Eng	o
25	20-Jun-07	Need more lashing points in the deck to lash down guns, not to use safety rails as they are not strong enough					X													make more points available See comment SCM#20	Source	o
26	21-Jun-07	Unsecured port side gangway door														X				Secured with bolt and lock to prevent coming out	Source	x
27	21-Jun-07	Firehose port side streamer deck, fell out during rough weather											X							Rolled up and placed back in its container	Recording	x

O: Open / X: Closed

5.2. Production-Log

5.2.1. Deep water

Production Log

M/V Pacific Titan Client: Nexus Energy Survey: 501 11 70 06 07 00 Area: VIC P49

Date: 11.06.2007 - 17.07.2007



Date	Seq	Line	Dir	FSP	LSP	TOT	SP	Int	BSP	Final	Traverse	Chargeable	Chargeable	Seis	NTBP	Comments
						SPs	(m)	(m)	(m)	CMP	kms	CMP	km ²	tapes		
14.06	00001	VGNX507-74-001	021.0*	1001	1245	245	25.00	5.0	1.00	6.12500	6.12500			1		Production 2D Line, Incomplete
14.06	00002	VGNX507-074-002	021.0*	1246	2000	755	25.00	5.0	1.00	18.87500	18.87500			2		Production 2D Line, Complete
14.06	00002	VGNX507-074-002	021.0*	2001	2120	120	25.00	4.9	1.00	3.00000	3.00000			2		Production Runout, Complete
14.06	00003	VGNX507-79-003	200.0*	1001	3071	1071	25.00	4.5	1.00	26.77500	26.77500			3-4		Production 2D Line, Complete
14.06	00003	VGNX507-79-003	200.0*	2072	2191	120	25.00	4.4	1.00	3.00000	3.00000			4		Production Runout, Complete
14.06	00004	VGNX507-84-004	020.0*	1001	1436	436	25.00	4.9	1.00	10.90000	10.90000			5		Production 2D Line, Incomplete
15.06	00005	VGNX507-84-005	020.0*	1437	2173	737	25.00	5.0	1.00	18.42500	18.42500			6		Production 2D Line, Complete
15.06	00005	VGNX507-84-005	020.0*	2174	2293	120	25.00	4.9	1.00	3.00000	3.00000			6		Production Runout, Complete
15.06	00006	VGNX507-80-006	200.0*	1001	2059	1059	25.00	4.8	1.00	26.47500	26.47500			7-8		Production 2D Line, Complete
15.06	00006	VGNX507-80-006	200.0*	2060	2179	120	25.00	4.9	1.00	3.00000	3.00000			8		Production Runout, Complete
15.06	00007	VGNX507-77-007	020.0*	1001	2008	1008	25.00	4.9	1.00	25.20000	25.20000			9-10		Production 2D Line, Complete
15.06	00007	VGNX507-77-007	020.0*	2009	2128	120	25.00	4.9	1.00	3.00000	3.00000			10		Production Runout, Complete
15.06	00008	VGNX507-81-008	200.0*	1001	2072	1072	25.00	4.5	1.00	26.80000	26.80000			11-12		Production 2D Line, Complete
15.06	00008	VGNX507-81-008	200.0*	2073	2192	120	25.00	4.2	1.00	3.00000	3.00000			12		Production Runout, Complete
15.06	00009	VGNX507-85-009	200.0*	1001	2089	1089	25.00	4.8	1.00	27.22500	27.22500			13-14		Production 2D Line, Midnight SP
16.06	00009	VGNX507-85-009	020.0*	2090	2165	76	25.00		1.00	1.90000	1.90000			14		Production 2D Line, Complete
16.06	00009	VGNX507-85-009	020.0*	2166	2285	120	25.00	4.6	1.00	3.00000	3.00000			14		Production Runout, Complete
16.06	00010	VGNX507-90-010	200.0*	1001	2084	1084	25.00	4.9	1.00	27.10000	27.10000			15-16		Production 2D Line, Complete
16.06	00010	VGNX507-90-010	200.0*	2085	2204	120	25.00	5.4	1.00	3.00000	3.00000			16		Production Runout, Complete
16.06	00011	VGNX507-87-011	020.0*	1001	2158	1158	25.00	4.9	1.00	28.95000	28.95000			17-18		Production 2D Line, Complete
16.06	00011	VGNX507-87-011	020.0*	2159	2278	120	25.00	4.9	1.00	3.00000	3.00000			18		Production Runout, Complete
16.06	00012	VGNX507-91-012	200.0*	1001	2082	1082	25.00	5.0	1.00	27.05000	27.05000			19-20		Production 2D Line, Complete
16.06	00012	VGNX507-91-012	200.0*	2083	2202	120	25.00	5.4	1.00	3.00000	3.00000			20		Production Runout, Complete
16.06	00013	VGNX507-94-013	200.0*	1001	1931	931	25.00	5.1	1.00	23.27500	23.27500			21		Production 2D Line, Complete
16.06	00013	VGNX507-94-013	200.0*	1932	2051	120	25.00	4.9	1.00	3.00000	3.00000			21		Production Runout, Complete
16.06	00014	VGNX507-49-014	280.0*	1001	1668	668	25.00	4.9	1.00	16.70000	16.70000			22-23		Production 2D Line, Midnight SP
17.06	00014	VGNX507-49-014	280.0*	1669	2088	420	25.00	4.9	1.00	10.50000	10.50000			23		Production 2D Line, Complete
17.06	00014	VGNX507-49-014	280.0*	2089	2208	120	25.00	4.9	1.00	3.00000	3.00000			23		Production Runout, Complete
17.06	00015	VGNX507-51-015	101.0*	1001	2114	1114	25.00	4.9	1.00	27.85000	27.85000			24-25		Production 2D Line, Complete
17.06	00015	VGNX507-51-015	101.0*	2115	2234	120	25.00	4.9	1.00	3.00000	3.00000			25		Production Runout, Complete
17.06	00016	VGNX507-53-016	280.0*	1001	2693	1693	25.00	4.6	1.00	42.32500	42.32500			26-27		Production 2D Line, Complete
17.06	00016	VGNX507-53-016	280.0*	2694	2813	120	25.00	4.6	1.00	3.00000	3.00000			27		Production Runout, Complete
17.06	00017	VGNX507-56-017	097.0*	1001	2528	1528	25.00	4.9	1.00	38.20000	38.20000			28-29		Production 2D Line, Complete
17.06	00017	VGNX507-56-017	097.0*	2529	2648	120	25.00	3.9	1.00	3.00000	3.00000			29		Production Runout, Complete
18.06	00018	VGNX507-54-018	278.0*	1001	2697	1697	25.00	4.9	1.00	42.42500	42.42500			30-31		Production 2D Line, Complete
18.06	00018	VGNX507-54-018	278.0*	2698	2817	120	25.00	4.9	1.00	3.00000	3.00000			31		Production Runout, Complete
18.06	00019	VGNX507-52-019	101.0*	1001	1521	521	25.00	4.7	1.00	13.02500	13.02500			32		Production 2D Line, aborted early due to weather, incomplete
22.06	00020	VGNX507-52-020	101.0*	1522	2627	1106	25.00	4.7	1.00	27.65000	27.65000			33-34		Production 2D Line, Complete
22.06	00020	VGNX507-52-020	101.0*	2628	2747	120	25.00	4.6	1.00	3.00000	3.00000			34		Production Runout, Complete
22.06	00021	VGNX507-50-021	282.0*	1001	2161	1161	25.00	4.5	1.00	29.02500	29.02500			35-36		Production 2D Line, Complete
22.06	00021	VGNX507-50-021	282.0*	2162	2281	120	25.00	4.4	1.00	3.00000	3.00000			36		Production Runout, Complete
22.06	00022	VGNX507-48-022	101.0*	1001	1938	938	25.00	5.0	1.00	23.45000	23.45000			37		Production 2D Line, Complete
22.06	00022	VGNX507-48-022	101.0*	1939	2058	120	25.00	4.9	1.00	3.00000	3.00000			37		Production Runout, Complete
23.06	00023	VGNX507-93-023	201.0*	1001	1974	974	25.00	5.0	1.00	24.35000	24.35000			38		Production 2D Line, Complete
23.06	00023	VGNX507-93-023	201.0*	1975	2094	120	25.00	5.1	1.00	3.00000	3.00000			38		Production Runout, Complete
23.06	00024	VGNX507-95-024	020.0*	1001	1640	640	25.00	4.2	1.00	16.00000	16.00000			39		Production 2D Line, Complete
23.06	00024	VGNX507-95-024	020.0*	1641	1760	120	25.00	4.9	1.00	3.00000	3.00000			39		Production Runout, Complete
23.06	00025	VGNX507-92-025	201.0*	1001	2000	1000	25.00	5.1	1.00	25.00000	25.00000			40-41		Production 2D Line, Complete
23.06	00025	VGNX507-92-025	201.0*	2001	2120	120	25.00	4.9	1.00	3.00000	3.00000			41		Production Runout, Complete
23.06	00026	VGNX507-86-026	022.0*	1001	2173	1173	25.00	4.5	1.00	29.32500	29.32500			42-43		Production 2D Line, Complete
23.06	00026	VGNX507-86-026	022.0*	2174	2293	120	25.00	4.6	1.00	3.00000	3.00000			43		Production Runout, Complete
23.06	00027	VGNX507-83-027	201.0*	1001	1767	767	25.00	4.9	1.00	19.17500	19.17500			44		Production 2D Line, Midnight SP
24.06	00027	VGNX507-83-027	201.0*	1768	2179	412	25.00	5.1	1.00	10.30000	10.30000			44		Production 2D Line, aborted early due to Whale sighted within 500m, incomplete
24.06	00028	VGNX507-88-028	022.0*	1001	2093	1093	25.00	4.9	1.00	27.32500	27.32500			46-47		Production 2D Line, Complete

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24.06.00028	VGNX507-88-028	022.0*	2094	2213	120	25.00	4.9	1.00	3.00000	3.00000		47	Production Runout, Complete
24.06.00029	VGNX507-82-029	202.0*	1001	2145	1145	25.00	4.9	1.00	28.62500	28.62500		48-49	Production 2D Line, Complete
24.06.00029	VGNX507-82-029	202.0*	2146	2265	120	25.00	5.1	1.00	3.00000	3.00000		49	Production Runout, Complete
24.06.00030	VGNX507-89-030	020.0*	1001	2081	1081	25.00	4.3	1.00	27.02500	27.02500		50-51	Production 2D Line, Complete
24.06.00030	VGNX507-89-030	020.0*	2082	2201	120	25.00	4.4	1.00	3.00000	3.00000		51	Production Runout, Complete
24.06.00031	VGNX507-78-031	200.0*	1001	2063	1063	25.00	4.6	1.00	26.57500	26.57500		52-53	Production 2D Line, Complete
24.06.00031	VGNX507-78-031	200.0*	2064	2183	120	25.00	4.6	1.00	3.00000	3.00000		53	Production Runout, Complete
25.06.00032	VGNX507-75-032	020.0*	1001	1993	993	25.00	4.8	1.00	24.82500	24.82500		54-55	Production 2D Line, Complete
25.06.00032	VGNX507-75-032	020.0*	1994	2113	120	25.00	4.9	1.00	3.00000	3.00000		55	Production Runout, Complete
25.06.00033	VGNX507-76-033	201.0*	1001	1998	998	25.00	4.7	1.00	24.95000	24.95000		56-57	Production 2D Line, Complete
25.06.00033	VGNX507-76-033	000.0*	1999	2118	120	25.00	4.9	1.00	3.00000	3.00000		57	Production Runout, Complete
25.06.00034	VGNX507-57-034	098.0*	1001	1859	859	25.00	4.9	1.00	21.47500	21.47500		58	Production 2D Line, Complete
25.06.00034	VGNX507-57-034	098.0*	1860	1979	120	25.00	4.6	1.00	3.00000	3.00000		58	Production Runout, Complete
25.06.00035	VGNX507-55-035	280.0*	1001	2528	1528	25.00	4.8	1.00	38.20000	38.20000		59-60	Production 2D Line, Complete
25.06.00035	VGNX507-55-035	000.0*	2529	2648	120	25.00	5.4	1.00	3.00000	3.00000		60	Production Runout, Complete
25.06.00036	VGNX507-58-036	020.0*	1001	1602	602	25.00	4.8	1.00	15.05000	15.05000		61	Production 2D Line, Complete
25.06.00036	VGNX507-58-036	020.0*	1603	1626	24	25.00		1.00	0.60000	0.60000		61	Production Runout, Midnight SP
26.06.00036	VGNX507-58-036	020.0*	1627	1722	96	25.00	5.2	1.00	2.40000	2.40000		61	Production Runout, Complete
26.06.00037	VGNX507-60-037	200.0*	1001	1628	628	25.00	5.0	1.00	15.70000	15.70000		62	Production 2D Line, Complete
26.06.00037	VGNX507-60-037	200.0*	1629	1748	120	25.00	4.9	1.00	3.00000	3.00000		62	Production Runout, Complete
02.07.00038	VGNX507-59-038	200.0*	1001	1174	174	25.00	3.6	1.00	4.35000			63-64	NTBP NTBP due to: Weather/sea/swell (standby at sea):
03.07.00038	VGNX507-59-038	000.0*	1175	1278	104	25.00	3.8	1.00	2.60000			64-65	NTBP NTBP due to: Weather/sea/swell (standby at sea):
03.07.00039	VGNX507-62-039	020.0*	1001	1624	624	25.00	5.1	1.00	15.60000	15.60000		66	Production 2D Line, Complete
03.07.00039	VGNX507-62-039	020.0*	1625	1744	120	25.00	5.1	1.00	3.00000	3.00000		66	Production Runout, Complete
03.07.00040	VGNX507-59-040	200.0*	1001	1478	478	25.00	4.0	1.00	11.95000	11.95000		67	Production 2D Line, Midnight SP
04.07.00040	VGNX507-59-040	200.0*	1479	1598	120	25.00	3.9	1.00	3.00000	3.00000		67	Production 2D Line, Complete
04.07.00040	VGNX507-59-040	200.0*	1599	1718	120	25.00	3.9	1.00	3.00000	3.00000		67	Production Runout, Complete
04.07.00041	VGNX507-64-041	020.0*	1001	1616	616	25.00	4.8	1.00	15.40000	15.40000		68	Production 2D Line, Complete
04.07.00041	VGNX507-64-041	020.0*	1617	1736	120	25.00	5.1	1.00	3.00000	3.00000		68	Production Runout, Complete
05.07.00042	VGNX507-73-042	020.0*	1001	1777	777	25.00	4.5	1.00	19.42500	19.42500		69	Production 2D Line, Complete
05.07.00042	VGNX507-73-042	020.0*	1778	1897	120	25.00	4.9	1.00	3.00000	3.00000		69	Production Runout, Complete
14.07.00043	VGNX507-72-043	200.0*	1001	1415	415	25.00	4.0	1.00	10.37500	10.37500		70	Production 2D Line, Incomplete
14.07.00044	VGNX507-72-044	200.0*	1296	1415	120	25.00	3.9	1.00	3.00000			71	Overlap due to: IT & Telecom, network, other:
14.07.00044	VGNX507-72-044	200.0*	1416	1777	362	25.00	3.5	1.00	9.05000	9.05000		71	Production 2D Line, Complete
14.07.00044	VGNX507-72-044	200.0*	1778	1897	120	25.00	3.5	1.00	3.00000	3.00000		71	Production Runout, Complete
14.07.00045	VGNX507-70-045	020.0*	1001	1648	648	25.00	5.1	1.00	16.20000	16.20000		72	Production 2D Line, Complete
14.07.00045	VGNX507-70-045	020.0*	1649	1768	120	25.00	5.1	1.00	3.00000	3.00000		72	Production Runout, Complete
14.07.00046	VGNX507-68-046	020.0*	1001	1544	544	25.00	3.9	1.00	13.60000	13.60000		73	Production 2D Line, Midnight SP
15.07.00046	VGNX507-68-046	200.0*	1545	1663	119	25.00	3.7	1.00	2.97500	2.97500		73	Production 2D Line, Complete
15.07.00046	VGNX507-68-046	200.0*	1664	1783	120	25.00	3.4	1.00	3.00000	3.00000		73	Production Runout, Complete
15.07.00047	VGNX507-66-047	020.0*	1001	1630	630	25.00	5.0	1.00	15.75000	15.75000		74	Production 2D Line, Complete
15.07.00047	VGNX507-66-047	020.0*	1631	1750	120	25.00	4.9	1.00	3.00000	3.00000		74	Production Runout, Complete
15.07.00048	VGNX507-61-048	200.0*	1001	1624	624	25.00	3.8	1.00	15.60000	15.60000		75	Production 2D Line, Complete
15.07.00048	VGNX507-61-048	200.0*	1625	1744	120	25.00	3.6	1.00	3.00000	3.00000		75	Production Runout, Complete
15.07.00049	VGNX507-96-049	020.0*	1001	1936	936	25.00	5.1	1.00	23.40000	23.40000		76	Production 2D Line, Complete
15.07.00049	VGNX507-96-049	020.0*	1937	2056	120	25.00	5.1	1.00	3.00000	3.00000		76	Production Runout, Complete
15.07.00050	VGNX507-97-050	200.0*	1001	1938	938	25.00	4.1	1.00	23.45000	23.45000		77	Production 2D Line, Complete
15.07.00050	VGNX507-97-050	200.0*	1939	2058	120	25.00	3.7	1.00	3.00000	3.00000		77	Production Runout, Complete
15.07.00051	VGNX507-63-051	020.0*	1001	1628	628	25.00	4.8	1.00	15.70000	15.70000		78	Production 2D Line, Complete
15.07.00051	VGNX507-63-051	020.0*	1629	1748	120	25.00	4.4	1.00	3.00000	3.00000		78	Production Runout, Complete
16.07.00052	VGNX507-67-052	200.0*	1001	1655	655	25.00	3.9	1.00	16.37500	16.37500		79	Production 2D Line, Complete
16.07.00052	VGNX507-67-052	200.0*	1656	1775	120	25.00	3.7	1.00	3.00000	3.00000		79	Production Runout, Complete
16.07.00053	VGNX507-71-053	020.0*	1001	1779	779	25.00	5.0	1.00	19.47500			80	NTBP NTBP due to: Mechanical, source, array airline:
16.07.00053	VGNX507-71-053	020.0*	1780	1899	120	25.00	4.9	1.00	3.00000			80	NTBP NTBP due to: Mechanical, source, array airline:
16.07.00054	VGNX507-65-054	200.0*	1001	1626	626	25.00	4.0	1.00	15.65000			81	NTBP NTBP due to: Mechanical, source, array airline:
16.07.00054	VGNX507-65-054	200.0*	1627	1746	120	25.00	3.9	1.00	3.00000			81	NTBP NTBP due to: Mechanical, source, array airline:

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16.07	00055	VGNXS07-69-055	000.0*	1001	1478	478	25.00	7.9	1.00	11.95000			82	NTBP	NTBP due to: Mechanical, source, array airline:
16.07	00056	VGNXS07-69-056	200.0*	1001	1652	652	25.00	3.9	1.00	16.30000	16.30000		83		Production 2D Line, Complete
16.07	00056	VGNXS07-69-056	200.0*	1653	1772	120	25.00	3.6	1.00	3.00000	3.00000		83		Production Runout, Complete
16.07	00057	VGNXS07-65-057	020.0*	1001	1346	346	25.00	5.1	1.00	8.65000	8.65000		84		Production 2D Line, Midnight SP
17.07	00057	VGNXS07-65-057	000.0*	1347	1626	280	25.00	4.7	1.00	7.00000	7.00000		84		Production 2D Line, Complete
17.07	00057	VGNXS07-65-057	000.0*	1627	1746	120	25.00	4.4	1.00	3.00000	3.00000		84		Production Runout, Complete
17.07	00058	VGNXS07-71-058	200.0*	1001	1779	779	25.00	4.3	1.00	19.47500	19.47500		85		Production 2D Line, Complete
17.07	00058	VGNXS07-71-058	200.0*	1780	1899	120	25.00	3.9	1.00	3.00000	3.00000		85		Production Runout, Complete
TOTAL										1429.42500	1366.40000	0.00000			

5.2.2. Bronze Whaler

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Date	Seq	Line	Dir	FSP	LSP	TOT SP	Int	BSP	Final	Traverse	Chargeable	Chargeable	Seis tapes	NTBP	Comments
						SPs	(m)	(km)	CMP	kms	CMP kms	km ²			
05.07	00001	VGNXS07-05-001	291.0*	1001	2057	1067	18.75	4.4	1.00	20.00625	20.00625		1		Production 2D Line, Complete
05.07	00001	VGNXS07-05-001	291.0*	2068	2227	160	18.75	4.6	1.00	3.00000	3.00000		1		Production Runout, Complete
05.07	00002	VGNXS07-03-002	111.0*	1001	2051	1081	18.75	4.6	1.00	20.26875	20.26875		2		Production 2D Line, Complete
05.07	00002	VGNXS07-03-002	111.0*	2082	2341	160	18.75	4.6	1.00	3.00000	3.00000		2		Production Runout, Complete
06.07	00003	VGNXS07-12-003	020.0*	1001	1457	457	18.75	4.7	1.00	8.56875	8.56875		3		Production 2D Line, Complete
06.07	00003	VGNXS07-12-003	020.0*	1458	1617	160	18.75	4.6	1.00	3.00000	3.00000		3		Production Runout, Complete
06.07	00004	VGNXS07-19-004	200.0*	1001	1526	526	18.75	4.8	1.00	9.86250	9.86250		4		Production 2D Line, Complete
06.07	00004	VGNXS07-19-004	200.0*	1527	1686	160	18.75	4.9	1.00	3.00000	3.00000		4		Production Runout, Complete
06.07	00005	VGNXS07-11-005	020.0*	1001	1449	449	18.75	4.9	1.00	8.41875	8.41875		5		Production 2D Line, Complete
06.07	00005	VGNXS07-11-005	020.0*	1450	1609	160	18.75	4.6	1.00	3.00000	3.00000		5		Production Runout, Complete
06.07	00006	VGNXS07-18-006	200.0*	1001	1515	515	18.75	4.8	1.00	9.65625	9.65625		6		Production 2D Line, Complete
06.07	00006	VGNXS07-18-006	200.0*	1516	1675	160	18.75	4.6	1.00	3.00000	3.00000		6		Production Runout, Complete
06.07	00007	VGNXS07-08-007	020.0*	1001	1360	360	18.75	4.9	1.00	6.75000	6.75000		7		Production 2D Line, Complete
06.07	00007	VGNXS07-08-007	020.0*	1361	1520	160	18.75	4.9	1.00	3.00000	3.00000		7		Production Runout, Complete
06.07	00008	VGNXS07-20-008	200.0*	1001	1484	484	18.75	4.8	1.00	9.07500	9.07500		8		Production 2D Line, Complete
06.07	00008	VGNXS07-20-008	200.0*	1485	1540	56	18.75		1.00	1.05000	1.05000		8		Production Runout, Midnight SP
07.07	00008	VGNXS07-20-008	200.0*	1541	1644	104	18.75		1.00	1.95000	1.95000		8		Production Runout, Complete
07.07	00009	VGNXS07-07-009	020.0*	1001	1245	245	18.75	4.8	1.00	4.59375	4.59375		9		Production 2D Line, Complete
07.07	00009	VGNXS07-07-009	020.0*	1246	1405	160	18.75	4.6	1.00	3.00000	3.00000		9		Production Runout, Complete
07.07	00010	VGNXS07-02-010	110.0*	1001	1862	862	18.75	4.5	1.00	16.16250	16.16250		10		Production 2D Line, Complete
07.07	00010	VGNXS07-02-010	110.0*	1863	2022	160	18.75	4.9	1.00	3.00000	3.00000		10		Production Runout, Complete
07.07	00011	VGNXS07-06-11	290.0*	1001	2040	1040	18.75	4.6	1.00	19.50000	19.50000		11		Production 2D Line, Complete
07.07	00011	VGNXS07-06-11	290.0*	2041	2200	160	18.75	4.6	1.00	3.00000	3.00000		11		Production Runout, Complete
07.07	00012	VGNXS07-09-012	020.0*	1001	1430	430	18.75	4.7	1.00	8.06250	8.06250		12		Production 2D Line, Complete
07.07	00012	VGNXS07-09-012	020.0*	1431	1590	160	18.75	5.1	1.00	3.00000	3.00000		12		Production Runout, Complete
07.07	00013	VGNXS07-21-013	200.0*	1001	1491	491	18.75	4.3	1.00	9.20625	9.20625		13		Production 2D Line, Complete
07.07	00013	VGNXS07-21-013	200.0*	1492	1651	160	18.75	4.4	1.00	3.00000	3.00000		13		Production Runout, Complete
07.07	00014	VGNXS07-10-014	020.0*	1001	1709	709	18.75	4.7	1.00	13.29375	13.29375		14		Production 2D Line, Complete
07.07	00014	VGNXS07-10-014	020.0*	1710	1761	52	18.75		1.00	0.97500	0.97500		14		Production Runout, Complete
08.07	00015	VGNXS07-22-015	200.0*	1001	1205	205	18.75	4.2	1.00	3.84375			15	NTBP	NTBP due to: Environmental, other fauna:
09.07	00016	VGNXS07-01-016	111.0*	1001	1393	393	18.75	4.6	1.00	7.36875	7.36875		16		Production 2D Line, Complete
09.07	00016	VGNXS07-01-016	111.0*	1394	1553	160	18.75	4.6	1.00	3.00000	3.00000		16		Production Runout, Complete
09.07	00017	VGNXS07-31-017	200.0*	1001	1484	484	18.75	4.1	1.00	9.07500	9.07500		17		Production 2D Line, Complete
09.07	00017	VGNXS07-31-017	200.0*	1485	1644	160	18.75	4.2	1.00	3.00000	3.00000		17		Production Runout, Complete
09.07	00018	VGNXS07-22-018	020.0*	1001	1502	502	18.75	4.7	1.00	9.41250	9.41250		18		Production 2D Line, Complete
09.07	00018	VGNXS07-22-018	020.0*	1503	1662	160	18.75	4.4	1.00	3.00000	3.00000		18		Production Runout, Complete
09.07	00019	VGNXS07-17-019	200.0*	1001	1506	506	18.75	4.5	1.00	9.48750	9.48750		19		Production 2D Line, Complete
09.07	00019	VGNXS07-17-019	200.0*	1507	1666	160	18.75	4.6	1.00	3.00000	3.00000		19		Production Runout, Complete
10.07	00020	VGNXS07-13-020	000.0*	1001	1079	79	18.75		1.00	1.48125			20	NTBP	NTBP due to: Environmental, other fauna:
10.07	00021	VGNXS07-13-021	020.0*	1001	1467	467	18.75	4.7	1.00	8.75625	8.75625		21		Production 2D Line, Complete
10.07	00021	VGNXS07-13-021	020.0*	1468	1627	160	18.75	4.4	1.00	3.00000	3.00000		21		Production Runout, Complete
10.07	00022	VGNXS07-23-022	200.0*	1001	1512	512	18.75	4.6	1.00	9.60000	9.60000		22		Production 2D Line, Complete
10.07	00022	VGNXS07-23-022	200.0*	1513	1672	160	18.75	4.9	1.00	3.00000	3.00000		22		Production Runout, Complete
10.07	00023	VGNXS07-14-023	020.0*	1001	1477	477	18.75	4.7	1.00	8.94375	8.94375		23		Production 2D Line, Complete
10.07	00023	VGNXS07-14-023	020.0*	1478	1637	160	18.75	4.9	1.00	3.00000	3.00000		23		Production Runout, Complete
10.07	00024	VGNXS07-24-024	200.0*	1001	1521	521	18.75	4.7	1.00	9.76875	9.76875		24		Production 2D Line, Complete
10.07	00024	VGNXS07-24-024	200.0*	1522	1681	160	18.75	4.4	1.00	3.00000	3.00000		24		Production Runout, Complete
10.07	00025	VGNXS07-15-025	020.0*	1001	1487	487	18.75	4.8	1.00	9.13125	9.13125		25		Production 2D Line, Complete
10.07	00025	VGNXS07-15-025	020.0*	1488	1647	160	18.75	4.6	1.00	3.00000	3.00000		25		Production Runout, Complete
10.07	00026	VGNXS07-25-026	200.0*	1001	1531	531	18.75	4.6	1.00	9.95625	9.95625		26		Production 2D Line, Complete
10.07	00026	VGNXS07-25-026	200.0*	1532	1691	160	18.75	4.6	1.00	3.00000	3.00000		26		Production Runout, Complete
11.07	00027	VGNXS07-32-027	020.0*	1001	1484	484	18.75	4.7	1.00	9.07500	9.07500		27		Production 2D Line, Complete
11.07	00027	VGNXS07-32-027	020.0*	1485	1644	160	18.75	4.6	1.00	3.00000	3.00000		27		Production Runout, Complete
11.07	00028	VGNXS07-26-028	200.0*	1001	1541	541	18.75	4.8	1.00	10.14375	10.14375		28		Production 2D Line, Complete

Production Log

M/V Pacific Titan Client: Nexus Energy Survey: 501 11 70 06 07 01 Area: VICP49

Date: 05.07.2007 - 14.07.2007



11.07 00028	VGNXS07-26-028	200.0*	1542	1701	160	18.75	4.6	1.00	3.00000	3.00000		28	Production Runout, Complete
11.07 00029	VGNXS07-33-029	020.0*	1001	1140	140	18.75	5.0	1.00	2.62500			29	NTBP NTBP due to: Environmental, other fauna:
11.07 00030	VGNXS07-33-030	020.0*	1001	1535	535	18.75	4.7	1.00	10.03125	10.03125		30	Production 2D Line, Complete
11.07 00030	VGNXS07-33-030	020.0*	1536	1695	160	18.75	4.6	1.00	3.00000	3.00000		30	Production Runout, Complete
11.07 00031	VGNXS07-27-031	200.0*	1001	1552	552	18.75	4.9	1.00	10.35000	10.35000		31	Production 2D Line, Complete
11.07 00031	VGNXS07-27-031	200.0*	1553	1712	160	18.75	4.9	1.00	3.00000	3.00000		31	Production Runout, Complete
11.07 00032	VGNXS07-16-032	020.0*	1001	1496	496	18.75	4.4	1.00	9.30000	9.30000		32	Production 2D Line, Complete
11.07 00032	VGNXS07-16-032	020.0*	1497	1656	160	18.75	6.1	1.00	3.00000	3.00000		32	Production Runout, Complete
11.07 00033	VGNXS07-04-033	111.0*	1001	2072	1072	18.75	-4.1	1.00	20.10000	20.10000		33	Production 2D Line, Complete
11.07 00033	VGNXS07-04-033	111.0*	2073	2232	160	18.75	-4.0	1.00	3.00000	3.00000		33	Production Runout, Complete
12.07 00034	VGNXS07-47-034	020.0*	1001	1378	378	18.75	4.9	1.00	7.08750	7.08750		34	Production 2D Line, Complete
12.07 00034	VGNXS07-47-034	020.0*	1379	1538	160	18.75	4.6	1.00	3.00000	3.00000		34	Production Runout, Complete
12.07 00035	VGNXS07-40-035	200.0*	1001	1540	540	18.75	4.6	1.00	10.12500	10.12500		35	Production 2D Line, Complete
12.07 00035	VGNXS07-40-035	200.0*	1541	1700	160	18.75	4.6	1.00	3.00000	3.00000		35	Production Runout, Complete
12.07 00036	VGNXS07-46-036	020.0*	1001	1430	430	18.75	4.7	1.00	8.06250	8.06250		36	Production 2D Line, Complete
12.07 00036	VGNXS07-46-036	020.0*	1431	1590	160	18.75	4.9	1.00	3.00000	3.00000		36	Production Runout, Complete
12.07 00037	VGNXS07-41-037	200.0*	1001	1482	482	18.75	4.8	1.00	9.03750	9.03750		37	Production 2D Line, Complete
12.07 00037	VGNXS07-41-037	200.0*	1483	1642	160	18.75	4.9	1.00	3.00000	3.00000		37	Production Runout, Complete
12.07 00038	VGNXS07-43-038	020.0*	1001	1483	483	18.75	4.5	1.00	9.05625	9.05625		38	Production 2D Line, Complete
12.07 00038	VGNXS07-43-038	020.0*	1484	1643	160	18.75	4.6	1.00	3.00000	3.00000		38	Production Runout, Complete
12.07 00039	VGNXS07-37-039	200.0*	1001	1538	538	18.75	4.3	1.00	10.08750	10.08750		39	Production 2D Line, Complete
12.07 00039	VGNXS07-37-039	200.0*	1539	1698	160	18.75	4.2	1.00	3.00000	3.00000		39	Production Runout, Complete
12.07 00040	VGNXS07-44-040	020.0*	1001	1430	430	18.75	4.6	1.00	8.06250	8.06250		40	Production 2D Line, Complete
12.07 00040	VGNXS07-44-040	020.0*	1431	1590	160	18.75	6.1	1.00	3.00000	3.00000		40	Production Runout, Complete
13.07 00041	VGNXS07-38-041	200.0*	1001	1544	544	18.75	4.3	1.00	10.20000	10.20000		41	Production 2D Line, Complete
13.07 00041	VGNXS07-38-041	200.0*	1545	1704	160	18.75	4.2	1.00	3.00000	3.00000		41	Production Runout, Complete
13.07 00042	VGNXS07-45-042	020.0*	1001	1429	429	18.75	4.8	1.00	8.04375	8.04375		42	Production 2D Line, Complete
13.07 00042	VGNXS07-45-042	020.0*	1430	1589	160	18.75	4.9	1.00	3.00000	3.00000		42	Production Runout, Complete
13.07 00043	VGNXS07-39-043	200.0*	1001	1553	553	18.75	4.6	1.00	10.36875	10.36875		43	Production 2D Line, Complete
13.07 00043	VGNXS07-39-043	200.0*	1554	1713	160	18.75	4.4	1.00	3.00000	3.00000		43	Production Runout, Complete
13.07 00044	VGNXS07-30-044	020.0*	1001	1483	483	18.75	4.7	1.00	9.05625	9.05625		44	Production 2D Line, Complete
13.07 00044	VGNXS07-30-044	020.0*	1484	1643	160	18.75	4.6	1.00	3.00000	3.00000		44	Production Runout, Complete
13.07 00045	VGNXS07-34-045	200.0*	1001	1532	532	18.75	4.4	1.00	9.97500	9.97500		45	Production 2D Line, Complete
13.07 00045	VGNXS07-34-045	200.0*	1533	1692	160	18.75	-4.0	1.00	3.00000	3.00000		45	Production Runout, Complete
13.07 00046	VGNXS07-28-046	020.0*	1001	1484	484	18.75	4.5	1.00	9.07500	9.07500		46	Production 2D Line, Complete
13.07 00046	VGNXS07-28-046	020.0*	1485	1644	160	18.75	4.4	1.00	3.00000	3.00000		46	Production Runout, Complete
13.07 00047	VGNXS07-35-047	200.0*	1001	1529	529	18.75	-4.0	1.00	9.91875	9.91875		47	Production 2D Line, Complete
13.07 00047	VGNXS07-35-047	200.0*	1530	1689	160	18.75	-4.0	1.00	3.00000	3.00000		47	Production Runout, Complete
13.07 00048	VGNXS07-29-048	020.0*	1001	1484	484	18.75	4.3	1.00	9.07500	9.07500		48	Production 2D Line, Midnight SP
13.07 00048	VGNXS07-29-048	020.0*	1485	1557	73	18.75		1.00	1.36875	1.36875		48	Production Runout, Complete
14.07 00048	VGNXS07-29-048	020.0*	1558	1644	87	18.75		1.00	1.63125	1.63125		48	Production Runout, Complete
14.07 00049	VGNXS07-36-049	200.0*	1001	1533	533	18.75	4.2	1.00	9.99375	9.99375		49	Production 2D Line, Complete
14.07 00049	VGNXS07-36-049	200.0*	1534	1693	160	18.75	4.2	1.00	3.00000	3.00000		49	Production Runout, Complete
14.07 00050	VGNXS07-42-050	020.0*	1001	1483	483	18.75	4.8	1.00	9.05625	9.05625		50	Production 2D Line, Complete
14.07 00050	VGNXS07-42-050	000.0*	1484	1643	160	18.75	4.9	1.00	3.00000	3.00000		50	Production Runout, Complete
TOTAL									627.13125	619.18125	0.00000		

6. Shipment List

Proforma invoice nr.	Date	Job#	Description	Receiver	Destination
PT-2007-052	7/18/2007	6318	Nexus Deep Water and Bronze Primary Tapes	CGGVERITAS AP KL Center	Malaysia
PT-2007-053	7/18/2007	6318	Nexus Deep Water and Bronze Copy Tapes	Nexus Energy	Australia

6.1. Shipment Details



PT-2007-052

Date: 18-Jul-07

SENDER
M/V Pacific Titan IN TRANSIT
Agent
NT Shipping Agencies
P.O. Box 443
Berrimah
Northern Territory 0828

Attn: Robbie
E-mail: robbie@ntshipping.com.au

Consignee:
CGG VERITAS ASIA PACIFIC
MAS ACADEMY - ITPS CENTRE, 3rd Floor
#2 Jalan SS7/13
47301 Kelana Jaya
Selangor, Malaysia

Attn: Baruzie
Phone:
Fax:

Type of freight: Best way	Comments: Nexus Energy Primary Tapes Deep Water 2D Seq 1 - 58 and Bronze 2D Seq 1 - 50
-------------------------------------	--

Box	Item	General description of content	Weight(kg)	Value(USD)
1	1-30	3590 Data tapes containing Deep Water seismic data (Tapes 1 - 30) (sequence 1 - 18)	7	100
2	1-30	3590 Data tapes containing Deep Water seismic data (Tapes 31 - 60) (sequence 18 - 35)	7	100
3	1-25	3590 Data tapes containing Deep Water seismic data (Tapes 61 - 85) (sequence 36 - 58)	7	100
4	1-30	3590 Data tapes containing Bronze seismic data (Tapes 1 - 30) (sequence 1 - 30)	7	100
5	1-20	3590 Data tapes containing Bronze seismic data (Tapes 31 - 50) (sequence 31 - 50)	5	70
	21	3590 Data tape containing EOJ-TEST (Tape 51)	0.2	10
		Observers' data		
	22	1 x CD containing observers/source/tape logs/Timing diagram, Shipping Proformas	0.1	10
		Nav data		
	23-24	2 x DVD Navigation data containing: final P1/90, Raw P294, Production/Processing Log	0.2	20
		QC data		
	25	1 x DVD QC deliverables	0.1	10
	26	1 x 3590 SEG Y tape	0.2	10
6	1-58	Deep Water 2D Brute Stack Plots Seq 1 - 58	4	20
	59-116	Deep Water 2D Near Trace Plots Seq 1 - 58		
7	1-50	Bronze 2D Brute Stack Plots Seq 1 - 50	3	20
	51-100	Bronze 2D Near Trace Plots Seq 1 - 50		
Please confirm receipt of goods to chobs.titan@cggveritas.com				
			40.8	

Total boxes: 7

Total value: 570

Certified true and correct
 CGG Veritas
 M/V Pacific Titan

 Sign Tyrone Hackett
 Chief Observer

Nexus Energy Ltd

Final Survey Report
 Deep Water & Bronze Whaler
 Area: VIC P/49 SE Australia
 Pacific Titan - Job 6318



PT-2007-053

Date: 18-Jul-07

SENDER
M/V Pacific Titan IN TRANSIT
Agent
NT Shipping Agencies
P.O. Box 443
Berrimah
Northern Territory 0828

Attn: Robbie
E-mail: robbie@ntshipping.com.au

Consignee:
NEXUS ENERGY
134 Little Lonsdale Street
Melbourne
Victoria 3000
Australia

Attn: Jane Rodgers
Tel: 61 3 9660 2500
Fax: 61 3 9654 9303

Type of freight: Best way	Comments: NT Shipping to hold shipment until further notice Nexus Energy Copy Tapes Deep Water 2D Seq 1 - 58 and Bronze 2D Seq 1 - 50
-------------------------------------	--

Box	Item	General description of content	Weight(kg)	Value(USD)
1	1-30	3590 Data tapes containing Deep Water seismic data (Tapes 1 - 30) (sequence 1 - 18)	7	100
2	1-30	3590 Data tapes containing Deep Water seismic data (Tapes 31 - 60) (sequence 18 - 35)	7	100
3	1-25	3590 Data tapes containing Deep Water seismic data (Tapes 61 - 85) (sequence 36 - 58)	7	100
4	1-30	3590 Data tapes containing Bronze seismic data (Tapes 1 - 30) (sequence 1 - 30)	7	100
5	1-20	3590 Data tapes containing Bronze seismic data (Tapes 31 - 50) (sequence 31 - 50)	5	70
	21	3590 Data tape containing EOJ-TEST (Tape 51)	0.2	10
		Observers' data		
	22	1 x CD containing observers/source/tape logs/Timing diagram, Shipping Proformas	0.1	10
		Nav data		
	23-24	2 x DVD Navigation data containing: final P1/90, Raw P294, Production/Processing Log	0.2	20
		QC data		
	25	1 x DVD QC deliverables	0.1	10
	26	1 x 3590 SEG Y tape	0.2	10
Please confirm receipt of goods to chobs.titan@cggveritas.com				
			33.8	

Total boxes: **5**

Total value: **530**

Certified true and correct
 CGG Veritas
 M/V Pacific Titan

 Sign Tyrone Hackett
 Chief Observer

7. Crew Lists



Swire Pacific Offshore

Pacific Titan Crew List

Date: 12th June 2007

No	Name	Rank	D/O/B/	Citizen	Passport no.	Exp/date
1	Theodore Strockyj	Capt	15/09/50	Australian	L5388831	16/05/09
2	Fraser Grant Hamilton	Chief Officer	14/09/72	Australian	L3631806	12-Jan-11
3	Derek Leeder	2nd Mate	15/11/46	Australian	L3125818	19/10/11
4	Carl Sayers	Chief Engineer	24/05/49	New Zealand	AA647005	14/03/13
5	William Baker	1st Engineer	8-Aug-56	New Zealand	AB559961	3-Sep-15
6	Gregory Pearce	2nd Engineer	24/06/59	Australian	M5554613	31/10/16
7	Patrick Simpson	E/eng	23/03/56	New Zealand	N560319	17/02/09
8	Mark Renwick	G.P.	6-Jan-48	New Zealand	L963669	15/04/07
9	John Masters	G.P.	22/08/49	New Zealand	AB385206	26/11/14
10	Dean Keoghan	G.P.	19/04/66	New Zealand	EA716448	
11	Rom Mildren	G.P.	2-Oct-43	New Zealand	R877307	
12	Donald Crawford	Chief Stwd	13/04/46	Australian	L5460283	31/12/07
13	Anthony McInnes	2nd Stwd	6-Apr-65	Australian	M5063583	30/05/16
14	Alan Gray	Chief Cook	20/02/60	Australian	L1299933	17/03/08
15	M. James	2nd Cook	11-Feb-58	Australian	L9179837	9-Jan-10
16	David Billington	Comp Mech	11.09.49	Australian	M2858580	30/06/15
17	Barton Painter	Comp Mech	13/09/74	Australian	L3782741	09.05.12
MULTIWAVE GEOPHYSICAL						
18	Sigurd Østerrud	Party Chief	15/10/61	Norwegian	20761184	2015-02-24
19	Michael Allen Suis	SL Observer	3/1/1964	American	017926578	2015-11-29
20	Jun Lumabas	Observer	31/10/80	Filipino	PP0826903	2010-02-12
21	Dervin Arenal Victorio	Trainee Observer	23/10/80	Filipino	QQ0522130	2010-06-14
22	Paul Stafford	Ch Navigator	11/5/1970	British	203602835	2012-04-24
23	Allan Beatie	Ch Observer	23/03/65	British	93105388	3-Dec-13
24	Markus Rahm	Chief Mechanic	23/08/71	Swiss	9791763	12/31/2007
25	Ronaldo Morales	Mechanic	22/03/59	Filipino	ZZ145454	2010-05-18
26	Reynaldo Vega	Mechanic	17/09/62	Filipino	UU0385562	19 dec 2011
27	Victor Satago	Mechanic	8/5/1968	Filipino	LL308971	08/05/2008
28	Jose Peralta	Mechanic	1/6/1950	Filipino	SS0035761	2010-12-01
29	Adam Gerbarski	Field Geophys.	13/12/66	Australian	M6368342	2/6/2017
30	Dennis Aquino	Geophy Trainee	2/8/1979	Filipino	NN0348967	7/14/2009
31	Dennis Maranon	Obs Trainee	22/09/77	Filipino	QQ0076201	17-03-10
32	Christopher Hernandez	Navigator	5/12/1983	Filipino	SS0301590	12/8/2010
33	Griffiths Sam	Nav Trainee	6/1/1982	Australian	L4519065	10/2/2013
34	Roberto Obras Sibayan	Medic	13/05/65	Filipino	TT0947029	23-Oct-11
35	William Lloyd	Client Rep	21.10.48	Australian	E1022292	14.03.15
36	Christopher Andrew Surmam	MMO	9/29/1968	Australian	L8640826	7-Jul-10
37	Richard Sykes	HSE	18/08/66	British	761103260	28/02/16

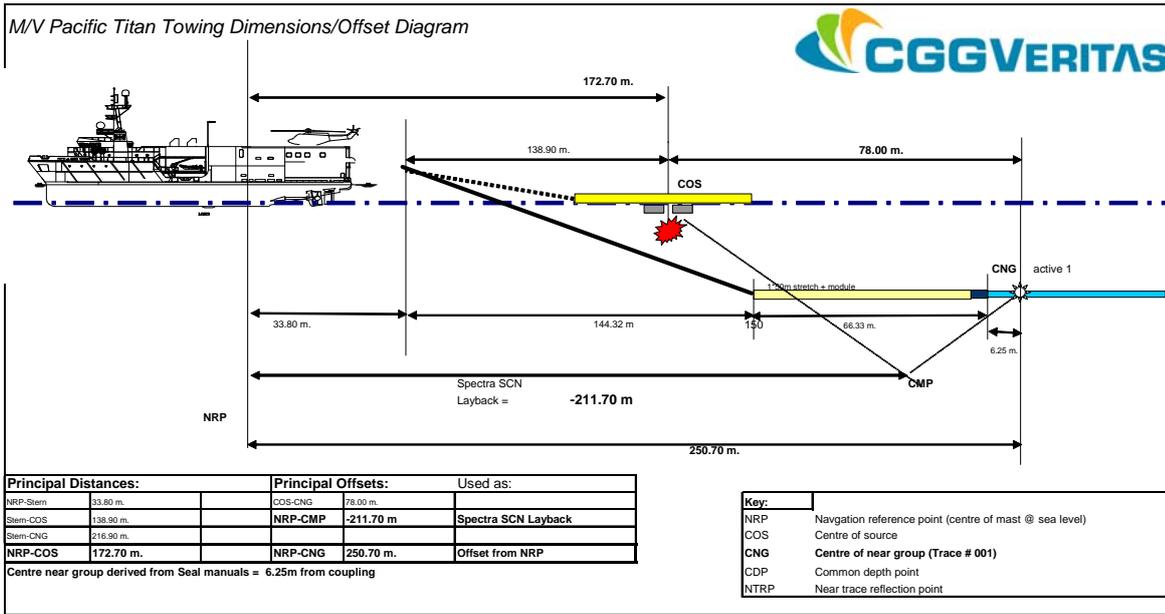


Pacific Titan Crew List

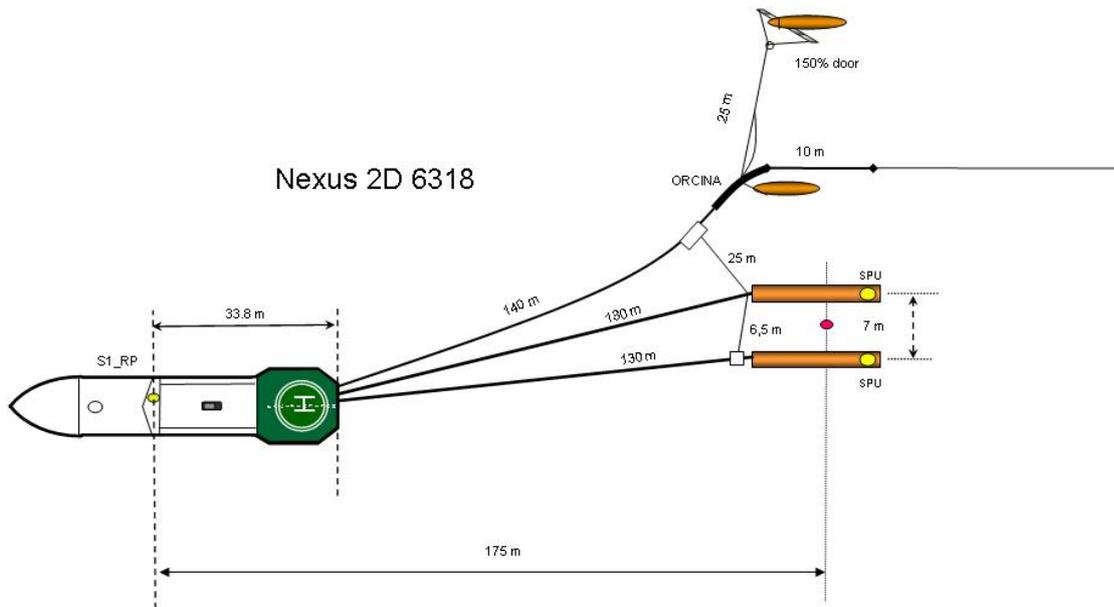
Date:27 June 2007

No	Name	Rank	D.O.B.	Citizen	Passport no.	Exp.date
1	Bruce Wallis	Capt	24.08.53	Australian	L8924123	25.01.11
2	James Riley	Ch. Off	11.11.80	Australian	L7347221	26.04.09
3	William Shelley	2nd Mate	23.07.64	Australian	E3022159	12.09.16
4	Tommy Boughton	Ch. Eng	30.03.55	Australian	M7065567	01.06.17
5	Waldemar Daszuta	1st Engineer	11.12.59	N.Z.	EA056700	7.12.10
6	C Wirepa	2nd Engineer	01.01.53	N.Z.	AB171451	01.06.14
7	Alan McDonald	I.R.	09.01.44	N.Z.	EA019065	01.11.10
8	Richard Fleetwood	I.R.	25.04.61	N.Z.	EA721210	05.06.12
9	C. Morrisson	I.R.	16.09.60	N.Z.	EA623341	29.03.12
10	P. Stills	I.R.	03.09.60	N.Z.	EA727664	07.06.12
11	Anthony Nicholls	C.Cook	13.04.60	Australian	M1072450	15.12.13
12	Rodney Blunsdon	2nd Cook	19.04.54	Australian	L7038824	17.12.08
13	Jamie Dent	Ch Stwd	21.09.61	Australian	L8494325	22.05.10
14	Delphin Cruz	2nd Stwd	10.10.69	Australian	M2808821	10.06.15
15	Ken Stephens	Comp Mech	17.09.51	Australian	M1851602	27.09.14
16	S Mudiyanselage	Comp Mech	05.01.63	SRI Lankan	M1858320	31.03.09
MULTIWAVE GEOPHYSICAL						
17	Haydn Brook	PC	10.07.73	Australian	E1024451	10.03.15
18	Tyrone Hackett	Chief Obs	19.12.71	Canadian	BD106336	16.06.10
19	Adam Powell	S/L Obs	04.11.71	Australian	E7534193	23.06.08
20	John Shannon Gracey	S/L Obs	18.07.59	British	500328449	26.07.10
21	Korybalski Slawomir	Obs	01.03.75	Polish	BM8392705	30.03.11
22	Bostad Ingvild	Obs	04.02.79	Norwegian	20874534	09.05.15
23	Steven Ryan	Sl. Nav	10.08.81	Australian	M5358989	02.06.16
24	Donald Hutchings	Nav.	16.03.59	Canadian	BD106063	20.03.08
25	Ralph Bannett	Ch. Mech	26.03.58	British	102069928	18.12.10
26	Derrien Regis	SL Mech	15.02.69	French	02YD55942	06.08.12
27	Agacoili William	SL Mech	18.11.51	Filipino	PP0392003	11.11.09
28	Paulo Goncalves	Mech	07.09.71	French	05AT81090	14.02.16
29	Ivar Zakariassen Almhjell	Mech	24.01.75	Norwegian	02-M0201130-19	12.04.2012
30	Nikolay Gorbunov	Field Geo	15.05.62	Russian	62N8463565	11.03.11
31	Niels Büchler-Friis	Field Geo	27.07.68	Danish	202048156	24.05.2016
32	William Lloyd	Client Rep	21.10.48	Australian	E1022292	14.03.15
33	Christopher Andrew Surman	MMO	9/29/1968	Australian	L8640826	7.7.10
34	Aleil Aliman	Medic	08.03.75	Filipino	RR0269506	20.10.10

8. Towing Configuration



8.1. Towing Offset Diagram



8.2. Streamer System Description

Streamer System Parameters	
Number of Streamers	1
Type of Streamer	Seal Solid
Streamer Length	6000m
Number of channels	480
Groups per Section (150 m)	12
Group Intervals	12.5 m (no overlap)
Active Group Array Length	12.5 m
Outside Diameter	55 mm
Solid Streamer Material	Outer 3.5mm Polypropylene
Normal maximum towing tension	55.6kN Ultimate breaking at 278kN
Connectors (Pins)	28
Channels per Module	60 at 2 ms
Data Transmission Link	Dual twisted Quarte AWG 22
Power	+/- 360 V DC
Leakage	30 mA differential circuit breaker
Near Offset (centre source – centre near group)	78m nominal (in line)
Streamer Depth	7m +/- 1.0m
Number of Front 50 m Stretch Sections	1 (85 mm diameter)
Number of Tail 50 m Stretch Sections	1 (50 mm diameter)
Number of Compasses per Streamer	23 (within digibirds)
Number of Depth Sensors per Streamer	23 (within digibirds)

Trace allocation	Near	Far	Aux
Streamer 1	1	480	
Auxiliary (in AXCUs)			a1 – a24

Hydrophone Parameters	
Hydrophone Specification	Sercel 12 element radial
No of Channels per Section	12
No of Hydrophones per Channel	8 in parallel
Active Length of Channel	12.5m
Channel Centre Spacing	12.5 m under a 1000daN load
Hydrophone Spacing	1.78m
Low Frequency Cut	3 Hz
Nominal Sensitivity, without electronics @ 1 bar @ 20°C	20 V/bar
Nominal Hydrophone Sensitivity	21.5 V/bar
Capacitance per Group	790 nF +/-10% at 22°C
Minimum Leakage Resistor	500 Mohm under 50 V

8.3. Streamer Layout

6000m

Item	Position	S/N	RDU	Bird Collar	RD/ACC Col	Trace N.O	Weights
DCXU		172					
Slip ring							
STBD AFT REEL							
Lead-in		n/a					
SHS		1354					2
HAU		232					
HESE		1862	1	15797	13492		21
HESA		1376					
SSAS	01	30514	2	34113	36213	1-12	4
SSAS	02	30313	3	31053		13-24	2
SSAS	03	30593	4	29023		25-36	3
SSAS	04	30552				37-48	4
SSAS	05	30511	5	31738	35804	49-60	5
LAUM	01	715					
SSAS	06	30613				61-72	5
SSAS	07	30352	6	29839		73-84	4
SSAS	08	30507				85-96	4
SSAS	09	30582	7	27772		97-108	7
SSAS	10	30539				109-120	4
LAUM	02	517					
SSAS	11	30499	8	29983	36203	121-132	3
SSAS	12	30324				133-144	3
SSAS	13	30513	9	27832		145-156	3
SSAS	14	30591				157-168	4
SSAS	15	30445	10	30232		169-180	3
LAUM	03	792					
SSAS	16	30579				181-192	7
SSAS	17	30542	11	30495	36199	193-204	6
SSAS	18	30567				205-216	5
SSAS	19	30503	12	29978		217-228	4
SSAS	20	30502				229-240	4
LAUM	04	734					
SSAS	21	30532	13	30137		241-252	4
SSAS	22	30583				253-264	4
SSAS	23	30576	14	30672	35806	265-276	5
SSAS	24	30569				277-288	5
SSAS	25	30574	15	30952		289-300	5
LAUM	05	566					
SSAS	26	30584				301-312	5
SSAS	27	30581	16	15076		313-324	6
SSAS	28	30590				325-336	4
SSAS	29	30580	17	31736	36205	337-348	5
SSAS	30	30588				349-360	4
LAUM	06	756					
SSAS	31	30592	18	27496		361-372	7
SSAS	32	30577				373-384	4
SSAS	33	30585	19	30246		385-396	5
SSAS	34	30571				397-408	6
SSAS	35	30573	20	30511	36211	409-420	5
LAUM	07	738					
SSAS	36	30578				421-432	4
SSAS	37	30572	21	30334		433-444	3
SSAS	38	30575				445-456	5
SSAS	39	30570	22	27169		457-468	4
SSAS	40	30586	23	31693		469-480	6
TAPU	01	104					
TES	01	1336					
Tailbuoy	01						

Source Configuration

8.4. Source System Description

Source Parameters	
Source Controller	Gunlink 2000
Number of Sources	1
Number of Sub-Arrays (Strings) per Source	2
Array Length	14.7m
Sub-Array Separation	7 m
Source Width	7 m
Source Separation	NA
Source Volume	3440 Cubic inches
Number of Hydrophones per String	3
Number of Depth Transducers per String	3
Number of Pressure Transducers per String	1
Number of Guns per String	9
Number of Clusters per String	3
Airgun Type	Bolt, 1500 & 1900 Long Life
Operating Pressure	2000 PSI
Depth of Guns	6.0 m +/- 1.0m
Peak to Peak Amplitude	85.0 barm
Primary to Bubble Ratio	21.2

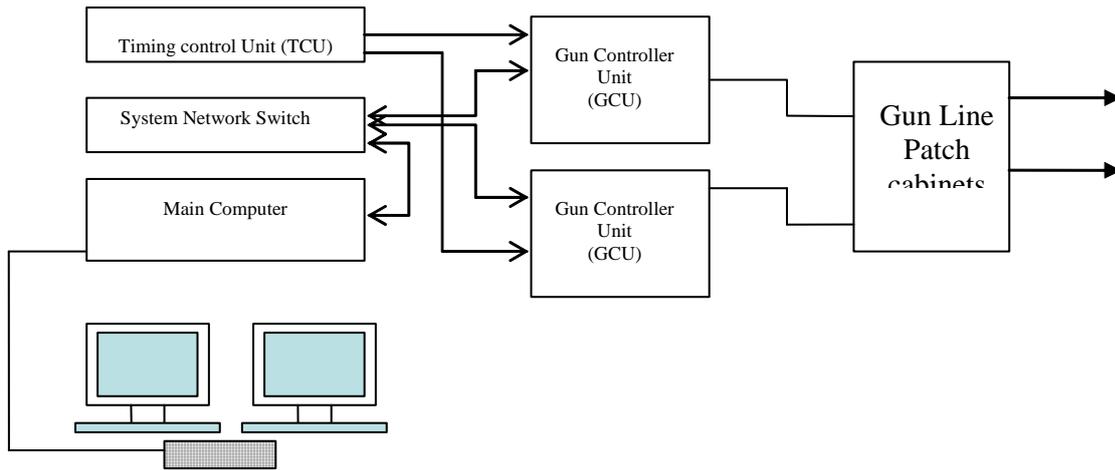
Gun Controller Description

The Gunlink 2000 Seismic Source Control and Acquisition System is the first phase of Seemap's range of new generation seismic gun controller systems.

The system uses the latest high speed micro processors to provide onboard firing control and sensor timing monitoring, continuous monitoring of near field phones and interrogation of depth and pressure sensors. In addition the system monitors the voltage and current of the firing pulses applied to the gun solenoids allowing the user to monitor variations in the performance of the guns and improve maintenance schedules.

An innovated Graphical User Interface (GUI) makes use of the latest advances in software design to provide the operator with maximum information on the operation and performance of the system without the clutter of text. An internal database maintains records of all system statistics and the data can be accessed via the in built web server using standard web browser programs.

To further reduce operator fatigue, the system draws the operator's attention to gun misfires, auto-fires and other faults by use of voice alerts issued from the system speakers.

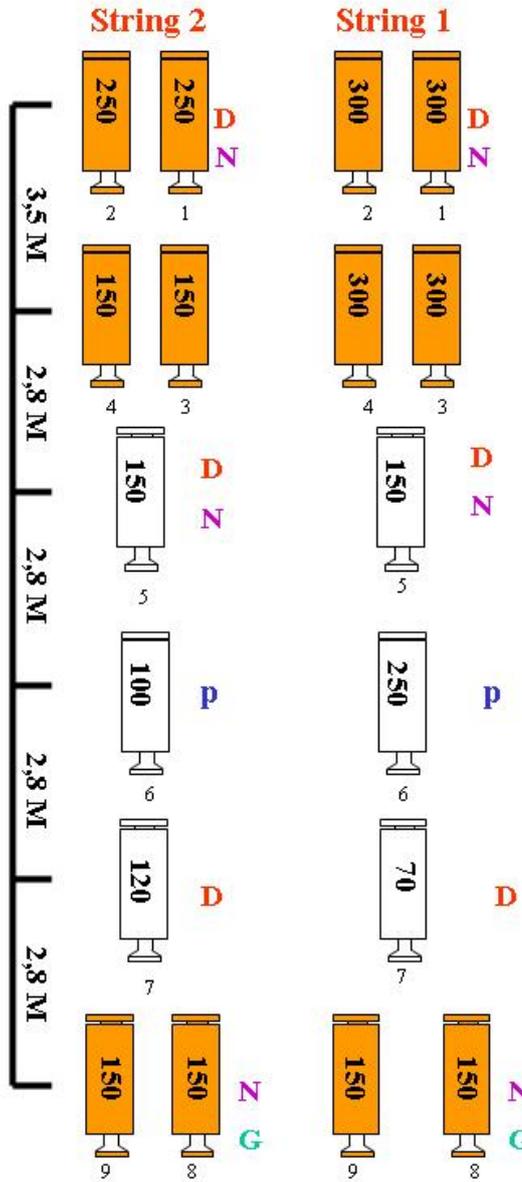


8.4.1. Gun Controller Specifications

Channels available	
Monitored Variables	Gun Fire time Near field Hydrophone Data Depth Sensor value Gun air pressure Value Solenoid coil current
Controlled Variables	Gun Fire time Gun Firing pulse length and Voltage
System Timing	0.01 ms
Fire Detect Window	120 ms
Synchronization Mode	Automatic
Fire Detect Method	Sensor
Fire Time Pick Method	Peak detect
Near Field Hydrophone S.I.	0.1 ms
Near Field Hydrophone Res.	16 Bit
Software	Version 2.4.2

8.4.2. Source Layout

Nexus 2D Job:6318



N = Near Field		Total volume = 3440cuin
D = Depth T.		
P = H.Press t.		
G = GPS		

8.4.3. Array Listing

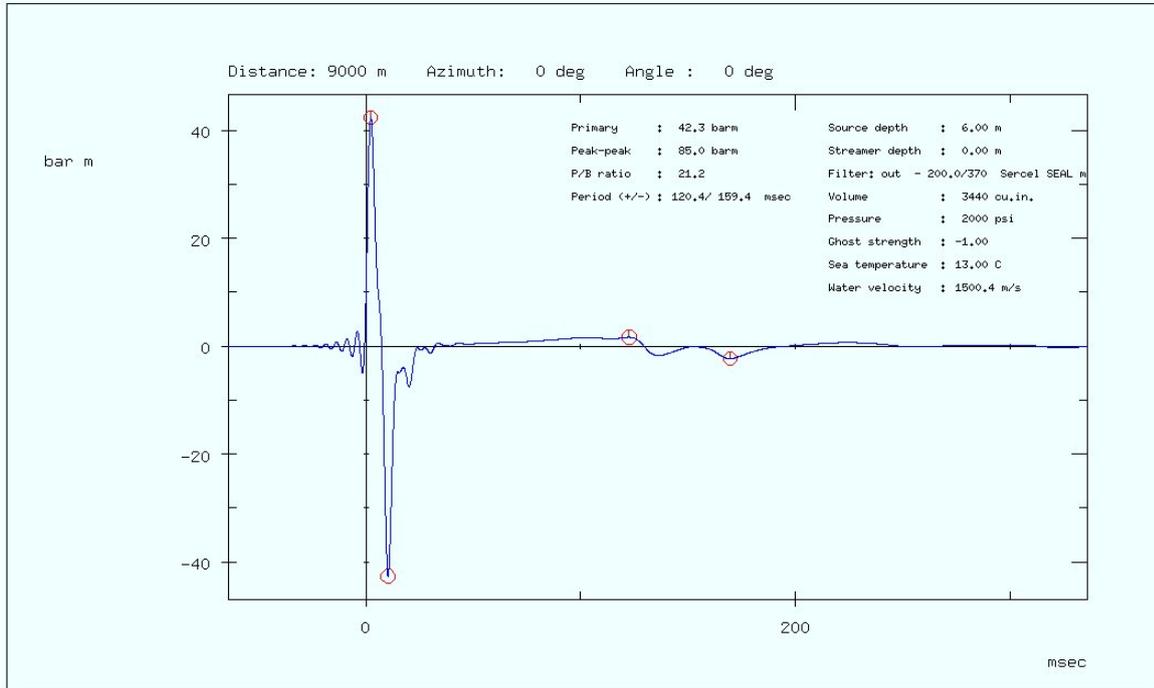
Total active volume: 3440 in³

Nominal pressure 2000 psi.

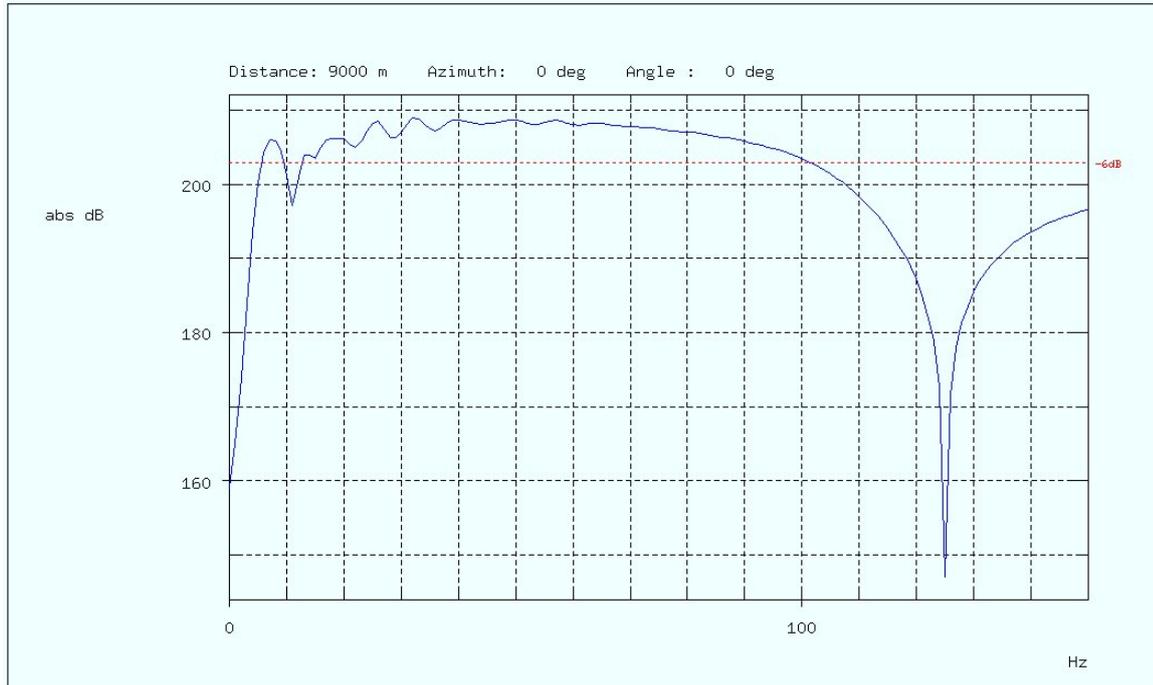
GUN#	GUN TYPE	Dist X (m)	Dist Y (m)	Dist Z (m)	Volume	Active / Spare	Sub-array #
1	1500LL	0	4.0	6	300	Active	1
2	1500LL	0	3.0	6	300	Active	1
3	1500LL	3.5	4.0	6	300	Active	1
4	1500LL	3.5	3.0	6	300	Active	1
5	1900LLX	6.3	3.5	6	150	Active	1
6	1500LL	9.1	3.5	6	250	Active	1
7	1900LLX	11.9	3.5	6	70	Active	1
8	1900LLX	14.7	3.9	6	150	Active	1
9	1900LLX	14.7	3.1	6	150	Active	1
10	1500LL	0	-3.1	6	250	Active	2
11	1500LL	0	-3.9	6	250	Active	2
12	1500LL	3.5	-3.1	6	150	Active	2
13	1500LL	3.5	-3.9	6	150	Active	2
14	1900LLX	6.3	-3.5	6	150	Active	2
15	1900LLX	9.1	-3.5	6	100	Active	2
16	1900LLX	11.9	-3.5	6	120	Active	2
17	1900LLX	14.7	-3.1	6	150	Active	2
18	1900LLX	14.7	-3.9	6	150	Active	2

8.5. 3440 Cu-Inch Pulse Response and Spectrum at 6m.

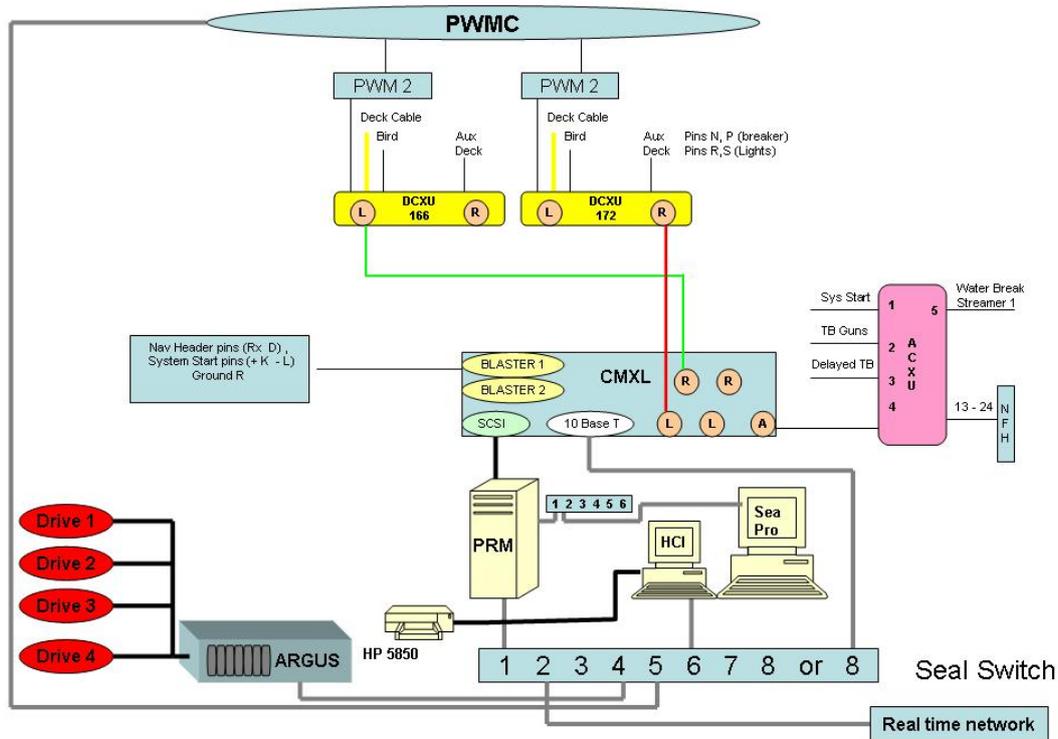
Far-field signature of array : 3440cuin_2str_6m



Amplitude spectrum of far-field signature of array : 3440cuin_2str_6m



9. Instrumentation Room System Diagram



10. Navigation and Positioning System Description

10.1. System Configuration

10.1.1. Navigation Hardware and Software

System	Hardware (Type and Serial No.)	Software version
CONCEPT Spectra	RTN μ (30/207P & 30/208P)	Spectra 10.9.01.10
	IBM E Server Workstations	Red Hat ELWS3.6
External Header	N/A	Gcs90v2
Acoustic System	N/A	
TS-meter	Saiv AS STD/CTD model SD 204	
Echo sounder	Simrad EA600	

10.1.2. System Timing

Spectra issued closures to the source firing system and recording system 50 milliseconds before the predicted time of peak pressure. Spectra received the time break back from the GunLink source controller and all Spectra system positions are output for this time.

An additional trigger was issued from spectra 450 milliseconds after time zero, this was sent to the recording system as a timing verification. The trigger was 5 milliseconds in duration.

10.2. Survey Positioning Method Used

This survey was carried out using CGGVeritas's standard mode of operation for single streamer/single source surveys.

Positioning of the vessel was by 3 Single frequency differential GPS systems using a delivery of differential correction data in RTCM 104 format and recorded in the P2/94 files.

The sources were positioned relative to the vessel using a network consisting of rGPS units mounted on sub-arrays 1 and 2.

The centre near group of the streamer was positioned by a combination of compass heading units and nominal offsets from the vessel.

The centre last group of the streamer was positioned using a network consisting of a rGPS system unit mounted on the tail buoy, a nominal offset to the tail buoy and a streamer mounted compass heading unit.

The streamer shape was modelled by 23 Digicourse series 5011 combined streamer depth control and magnetic compass units on the streamer.

Least squares condition equations for the streamer assuming circular arcs between compasses and relating the tracking nodes, compasses, tension corrected distances between compasses, rotation bias and scale were used to compute scale, rotation and individual compass corrections. The streamer shape was then computed by the circular arc method.

10.3. Surface Positioning

10.3.1. Vessel Navigation

Summary

System 1: Fugro Multifix 5 Standard Version 1.0
Differential correction delivery via Starfix Spotbeam and Inmarsat B.

System 2: Fugro Multifix 5 Standard Version 1.0
Differential correction delivery via Starfix Spotbeam and Inmarsat B.

System 3: Fugro MRDGPS Standard Version 3.03.02
Differential correction delivery via Starfix Spotbeam and Inmarsat B.

Differential

Correction

Systems: Fugro Skyfix via Spot Beam (OCSAT) satellite and Fugro Starfix via Inmarsat (POR).

All systems had the same accuracy and were set to have the same weight in the solution.

Fugro Multifix is a multiple reference station DGPS system tailored for the specific needs of seismic surveying. State-of-the art algorithms combine reference station data and pseudo range measurements into the best position estimates.

By employing a correlation model for weighting the multiple range corrections in a least squares estimation process, the optimum pseudo-range corrections are obtained. W-testing and F-testing techniques detect and reject correction outliers.

Quality control is based upon UKOOA's recommended DGPS quality indicators - the precision and reliability of the fix are displayed as an Error Ellipse and Marginally Detectable Errors (MDE).

The differential corrections were transmitted to, and received on-board the vessel by two independent means and provided a high degree of redundancy to ensure continuous vessel positioning.

Although Selective Availability was turned off in May 2000 differential corrections are still required to provide a high quality continuous vessel position. Less frequent updates are required however.

10.3.2. Float Navigation

Source and Tailbuoy surface navigation was provided by Seatex Seatrack relative GPS. The in-sea units incorporated a GPS receiver and interfacing for direct data transmission of the raw satellite pseudo-range data via UHF link to the vessel.

On board the vessel, the raw pseudo-range data from the float unit was matched with simultaneously received data at the vessel's GPS receiver to compute a vector describing the location of the float unit relative to the vessel from which the float position was derived. Relative positioning CEP was better than 2 m.

10.4. Streamer and Source Positioning

10.4.1. Streamer Compasses

23 series 5011 Digicourse combined magnetic compass and streamer depth controllers were attached to each streamer. All compasses were used for positioning and shaping the streamers.

Compass Sampling Rate = 2 second
Averaging constant = 14 seconds

Compass performance was monitored on a line-to-line basis throughout the acquisition phase of the survey.

10.4.2. Gyro Compass

The gyrocompasses used during the survey were:

Gyro 1 - Simrad HS50 GPS
Gyro 2 - Tokyo Keiki MK.ES

The gyro correction values as computed during the mobilisation calibration were as follows:

Gyro 1 - plus 1.46 degrees
Gyro 2 - plus 5.12 degrees

10.5. Auxilliary Navigation Sensors

10.5.1. Echo Sounder

The echo sounder speed of sound was set to 1500 m/s. A draught correction of zero was entered in the echo sounder. Depth data was recorded throughout the survey using a dual transducer/dual frequency (12 KHz, 200 KHz) Simrad EA600 Echo sounder. Due to the proximity of the survey and the depths encountered the 12KHz transducer was used as the master echo sounder.

11. Survey Pre-plots

11.1. Geodetics

Satellite Datum
Datum Name: WGS84
Spheroid Name: WGS84
Semi Major Axis: 6378137.0
Inverse Flattening: 298.2572236

Survey Datum
Datum Name: GDA94
Spheroid Name: GRS80
Semi Major Axis: 6378137.0
Inverse Flattening: 298.2572221
Dx (m): 0.0
Dy (m): 0.0
Dz (m): 0.0
Rx (sec): 0.0
Ry (sec): 0.0
Rz (sec): 0.0
Ds (ppm): 0.0

Projection Type: Universal Transverse Mercator 55° S
Origin Longitude: 147.000E
Origin Latitude: 0000.00N
False Easting: 500,000.00E
False Northing: 10,000,000.00N

12. Navigation Systems Verification and Monitoring

12.1. Gyro Monitoring

Dockside verification was performed, Singapore on 04th October 2006.

12.2. GPS Monitoring

Health checks onshore were carried out to verify that the installation was satisfactorily operational (data reception, transmission, processing and Logging were verified) and that operational settings were correct. Each system used, including duplicates was verified.

12.3. RGPS Health Checks

The last RGPS verifications were held at Loyang Wharf, Singapore on the 04th of October 2006 to verify installation and operational settings where satisfactory.

13. Navigation Processing

13.1. The FGPS Seispos System

SeisPos is an off-line navigation QC and post-processing system for 2D and 3D streamer surveys supplied by Fast Geophysical Processing Services. It runs under various Windows operating systems and has a graphical front end. A relational database management system is used for data storage. SeisPos is capable of automatic filtering and gating of the observations in addition to manual editing, before new adjustments are calculated. There is a comprehensive set of QC tools available such as graphical plots of any node or observation parameters and combinations of these, comparison of online and processed P1/90.

13.2. First Line Test data

A water-break analysis was performed during the first line to confirm the nominal offsets for the front end of the streamer. An offset shot was also performed after any streamer re-deployment.

13.3. Initial QC

Initial QC consisted of on-line monitoring of the systems and of producing an end of line QC report utilising the Spectra QCN (Quality Control Node). The report was generated as a PDF document. If any discrepancies were found, they would be further investigated and any problems were noted in the navigation logs.

The report included comparisons between the systems, plots of network reliability, SMA (Semi Major Axis), MDE (Mean Detectable Error) and TS-plots of compasses, depths and source separation.

13.4. Post-processing Flow

The lines were post processed using CGGVeritas's standard 3D processing flow consisting of the following stages:

- Import P2/94 to database and check for header changes.
- Check for missing shots and perform shot edits.
- Update a-priori SD's and magnetic declination if required.
- Pre-process data applying standard gating and filtering, hand-edit any remaining observation spikes.
- Compass calibration and bias check.
- Network adjustment
- Processing QC report generation.
- Export final P1/90
- QC of final P1/90
- Comparison of online and final P1/90

13.5. Final QC

Final QC was performed during the post processing and consisted of checking the various reports and plots generated by SeisPos, checking consistency of logs and P1/90 QC and comparison. Any discrepancy was noted in the processing log.

13.6. Water Depth Processing

The recorded water depth data was corrected for vessel draught, and a speed of sound correction was also applied to the processed water depth.

Corrections for draft and water velocity were carried out in post-processing.

Due to problems with the echo sounder (see below) the above method applies to all data acquired by echo sounder which generally meant anything shallower of 800m water depth. Anything over was gathered from the Seismic QC utilizing the first break of the near receiver. After Promax automatically detects the first break, it is manually edited and QC'd before a water velocity is applied and output as a ASCII file. In this case a water velocity of 1508 metres per second was used for both surveys.

For the Bronze survey deliverables a gif file displaying the water bottom from each P190 was supplied as an extra QC measure. As there were only parts of the line edited for water depth in this survey this step was required.

On the Deep survey each entire line was edited for depths with the minimum water depth being 1500m.

14. Observations

14.1. Navigation Summary

The vast majority of systems performed well throughout the survey. Each system's performance is described in further detail below.

14.1.1. DGPS Systems

All DGPS systems performed well during this survey.

14.1.2. Echo Sounder

The 12 kHz transducer struggled to sound water bottoms over 1000m. Since the minimum depth for the Deep survey was 2200m we did not acquire any meaningful data on this prospect. Only a minority of lines on the Bronze prospect that did not enter into water depths further than 1000m were acquired successfully. This is considered abnormal behaviour by this piece of equipment that is specified to reach depths of 5000m. Communication was established with the manufacturer Kongsberg who walked us through some preliminary tests. The tests came out inconclusive and an investigation is currently underway.

14.1.3. Gyro

The primary and secondary gyro performed well during the survey.

14.1.4. RGPS

The RGPS units performed consistently well throughout the duration of both surveys.

14.2. Processing and QC Summary

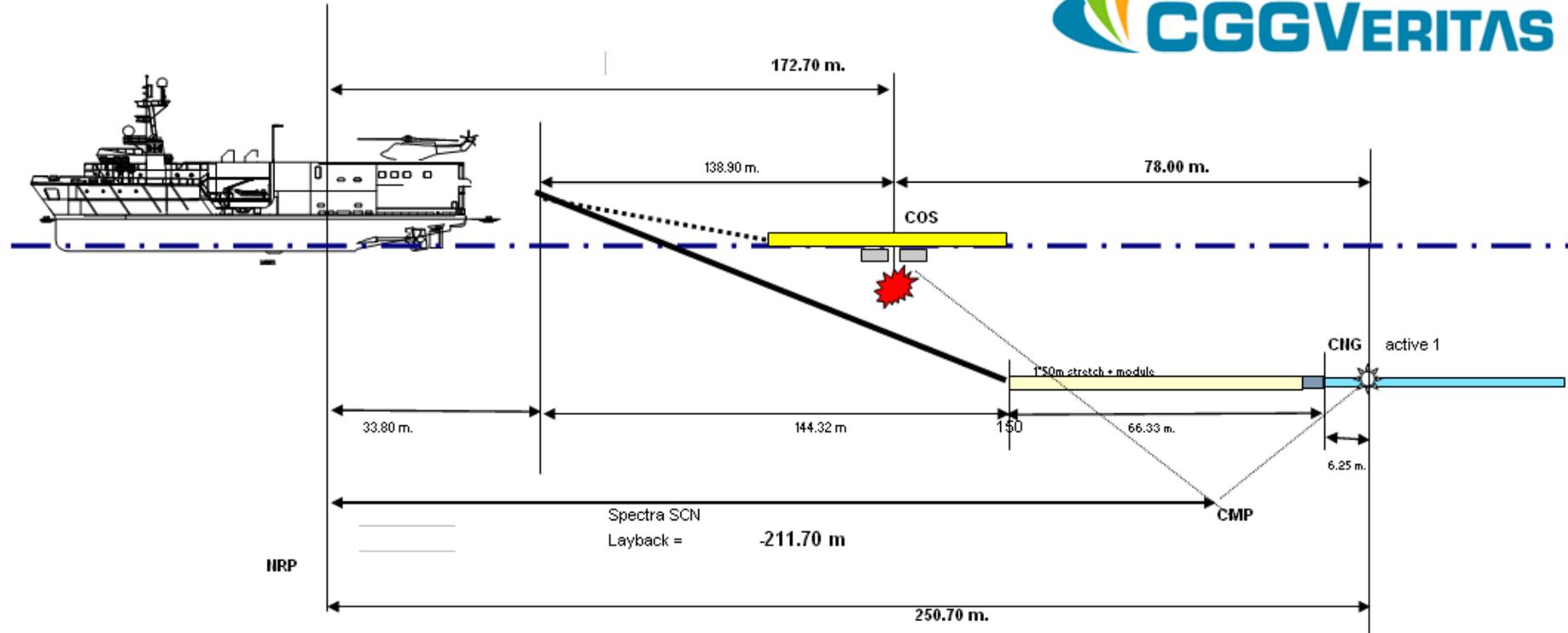
Weather and operational pressures meant that the operation continued through periods of normally unfavourable conditions. Therefore we did experience some lines with significant movement in the compass data affecting the overall positions. However the data quality during this survey was generally good and the client's specifications for the survey were met. Towards the end of the survey at the continuation of the Deep survey (seq #48 onwards) compass S1C17 was rejected in processing due to a higher than average compass bias. There are no other significant items to report.

15. Navigation Systems & Diagrams

15.1. DGPS Reference Stations

WGS84				
Ref. St. Name	No.	Latitude	Longitude	Height (m)
Bathurst	336	33° 25' 46.881''S	149° 34' 01.969 ''E	756.65
Cobar	316	31° 29' 57.432''S	145° 50' 20.345 ''E	270.16
Melbourne	385	37° 48' 29.005 '' S	144°57'48.030 '' E	82.05
Brisbane	275	27° 28' 38.489''S	153° 01' 37.351 ''E	93.13
Ceduna	355	32° 07' 03.049 '' S	133° 41' 22.851'' E	7.27

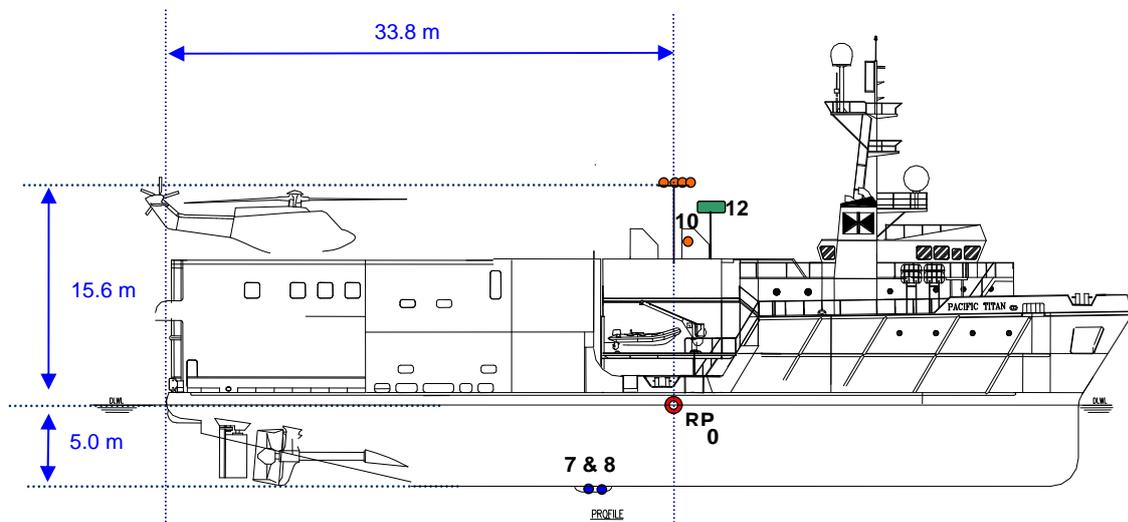
M/V Pacific Titan Towing Dimensions/Offset Diagram



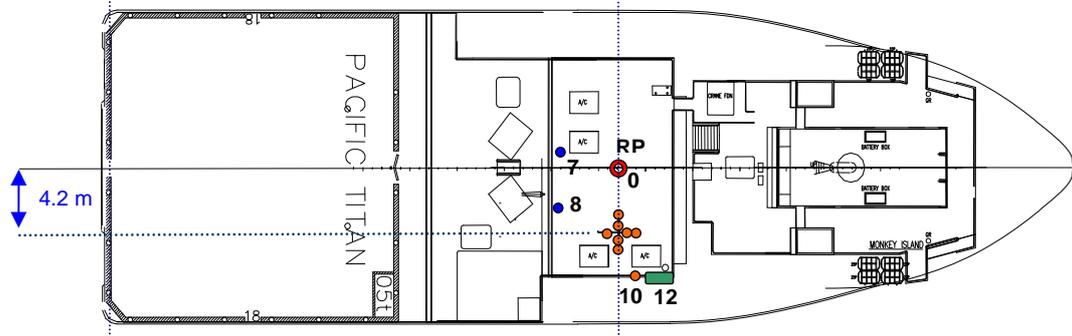
Principal Distances:		Principal Offsets:		Used as:
NRP-Stern	33.80 m.	COS-CNG	78.00 m.	
Stern-COS	138.90 m.	HRP-CMP	-211.70 m	Spectra SCH Layback
Stern-CNG	216.30 m.			
HRP-COS	172.70 m.	HRP-CIIG	250.70 m.	Offset from HRP
Centre near group derived from Seal manuals = 6.25m from coupling				

Key:	
NRP	Navigation reference point (centre of mast @ sea level)
COS	Centre of source
CIIG	Centre of near group (Trace # 001)
CDP	Common depth point
NTRP	Near trace reflection point

15.2. Antenna Offsets

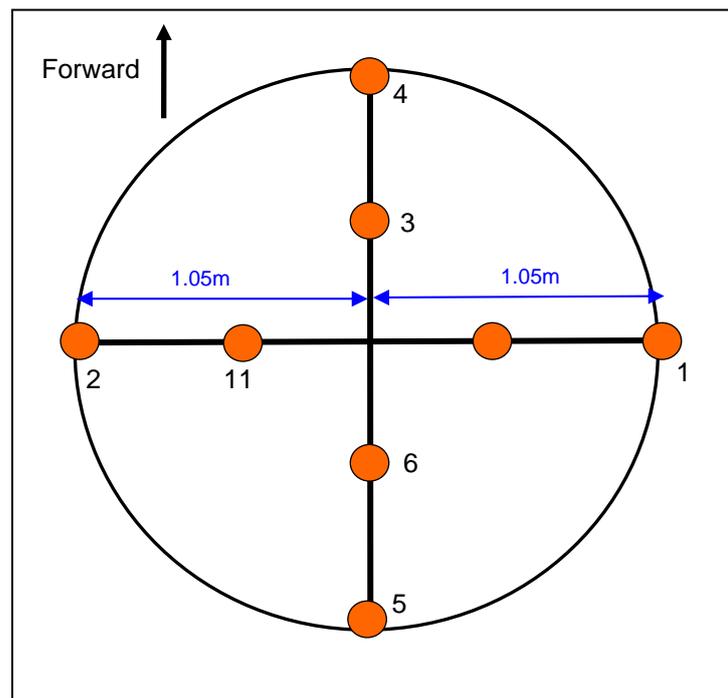


See following page for detail of antenna mast



No.	Node/Name	X	Y	Z	Description	Cable ID
0	V1	0.00	0.00	0.00	Vessel Reference Point	
		0.00	-33.80	0.00	Vessel Centre Stern from Ref Point	
1	V1G1, V1G3, V1G5	5.25	0.00	15.60	GPS Antenna	2 Red Rings
2	V1G2, V1G4	3.15	0.00	15.60	GPS Antenna	5 Red Rings
3					Motorola UHF Radio Antenna	1 Yellow Ring
4	Spot				Spotbeam Antenna	3 Red Rings
5					Seatex Yaggi VCU, UHF Antenna	4 Red Rings
6					Seatex Omni VCU, UHF Antenna	1 Red Ring
7	V1E1	-1.3	-5.8	-5.0	Simrad EA 600 200 kHz Transducer	
8	V1E2	1.5	-6.1	-5.0	Simrad EA 600 12 kHz Transducer	
9	Speedlan	Above Inmarsat Dome			2.4 GHz Antenna	
10	Runt 1				Trimble Bullet III GPS Antenna	
11					Sailor VHF Radio Antenna	2 Yellow Rings
12	V1GY1				Simrad GPS Gyro	

Detail of Antenna Mast



15.3. Nexus, Navigation Processing Log



Processing Log

Client: Nexus **M/V Pacific Titan**
Job No: 6318
Prospect: Deep and Bronze surveys

Deep

Nav_LineName	NavSeqnum	RunIn_FOL	Nav_FGSP	Nav_LGSP	Line_status	Processing_comments
VGNXS07-74-001	1		1001	1245	Complete	Line aborted early d/t air leak
VGNXS07-74-002	2	1126	1246	2120	Complete	Continuation of seq #001 d/t air leak. Depths only inserted from 1246-2120
VGNXS07-79-003	3		1001	2191	Complete	
VGNXS07-84-004	4		1001	1436	Complete	Line aborted early d/t compressors
VGNXS07-84-005	5	1317	1437	2293	Complete	1452 missed shot point. Continuation of seq #004 d/t compressors. Depths only inserted from 1437-2293
VGNXS07-80-006	6		1001	2179	Complete	
VGNXS07-77-007	7		1001	2128	Complete	
VGNXS07-81-008	8		1001	2192	Complete	1370 bad shot (fired early) 1594 bad shot (fired early)
VGNXS07-85-009	9		1001	2285	Complete	
VGNXS07-90-010	10		1001	2204	Complete	
VGNXS07-87-011	11		1001	2278	Complete	
VGNXS07-91-012	12		1001	2202	Complete	
VGNXS07-94-013	13		1001	2051	Complete	
VGNXS07-49-014	14		1001	2208	Complete	GPS5 Rejected due to unit variance spike caused by the re-estimate of the main network

VGNXS07-51-015	15		1001	2234	Complete	
VGNXS07-53-016	16		1001	2813	Complete	
VGNXS07-56-017	17		1001	2648	Complete	GPS1 and GPS3 rejected d/t high unit variance
VGNXS07-54-018	18		1001	2817	Complete	SP2648 missed shot SP2007 Echosounder jumps 500m SP1190 to SP 1300 high stretch value Large Variation in Speed SP 1180 -1330, causes poor source and vessel control
VGNXS07-52-019	19		1001	1521	Complete	Line aborted early d/t weather
VGNXS07-52-020	20	1402	1522	2747	Complete	Continuation of seq #019 d/t weather.
VGNXS07-50-021	21		1001	2281	Complete	
VGNXS07-48-022	22		1001	2058	Complete	
VGNXS07-93-023	23		1001	2094	Complete	
VGNXS07-95-024	24		1001	1760	Complete	
VGNXS07-92-025	25		1001	2120	Complete	Compasses Noisy
VGNXS07-86-026	26		1001	2293	Complete	
VGNXS07-83-027	27		1001	2179	Complete	
VGNXS07-88-028	28		1001	2213	Complete	Echo Sounder jump 500m SP1835
VGNXS07-82-029	29		1001	2265	Complete	
VGNXS07-89-030	30		1001	2201	Complete	
VGNXS07-78-031	31		1001	2183	Complete	
VGNXS07-75-032	32		1001	2113	Complete	
VGNXS07-76-033	33		1001	2118	Complete	Missed SP 1237
VGNXS07-57-034	34		1001	1979	Complete	
VGNXS07-55-035	35		1001	2648	Complete	
VGNXS07-58-036	36		1001	1722	Complete	
VGNXS07-60-037	37		1001	1748	Complete	
VGNXS07-59-038	38		1001	1718	NTBP	Line aborted d/t weather & loss of cable balast
VGNXS07-62-039	39		1001	1744	Complete	
VGNXS07-59-040	40		1001	1718	Complete	
VGNXS07-64-041	41		1001	1736	Complete	depth < 6m compass 4 sp's 1308-1315, 1379-1388

VGNXS07-73-042	42		1001	1897		1592 Spike in stretch observed most likely d/t extreme boat movement at time.
VGNXS07-72-043	43		1001	1415	Complete	S1C17 rejected in processing d/t high bias. Line aborted early d/t loss of network communications
VGNXS07-72-044	44	1296	1416	1897	Complete	Continuation of seq #043 d/t network communications
VGNXS07-70-045	45		1001	1768	Complete	
VGNXS07-68-046	46		1001	1783	Complete	
VGNXS07-66-047	47		1001	1750	Complete	
VGNXS07-61-048	48		1001	1744	Complete	S1C17 rejected in processing d/t high compass bias
VGNXS07-96-049	49		1001	2056	Complete	S1C17 rejected in processing d/t high compass bias E/S none active for all of the line
VGNXS07-97-050	50		1001	2058	Complete	S1C17 rejected in processing d/t high compass bias
VGNXS07-63-051	51		1001	1748	Complete	S1C17 rejected in processing d/t high compass bias
VGNXS07-67-052	52		1001	1775	Complete	S1C17 rejected in processing d/t high compass bias
VGNXS07-71-053	53		1001	1899	NTBP	S1C17 rejected in processing d/t high compass bias S1d5 under 6m depth 1018 - 1032 min. 5.2m NTBP d/t air leak in guns
VGNXS07-65-054	54		1001	1746	NTBP	S1C17 rejected in processing d/t high compass bias NTBP d/t air leak in guns
VGNXS07-69-055	55		1001	1772	NTBP	NTBP d/t air leak discovered during line
VGNXS07-69-056	56		1001	1772	Complete	S1C17 rejected in processing d/t high compass bias
VGNXS07-65-057	57		1001	1746	Complete	S1C17 rejected in processing d/t high compass bias
VGNXS07-71-058	58		1001	1899	Complete	S1C17 rejected in processing d/t high compass bias

Bronze						
Nav_LineName	NavSeqnum	RunIn_FOL	Nav_FGSP	Nav_LGSP	Line_status	Processing_comments
VGNXS07-05-001	1		1001	2227	Complete	Depths inserted sp's 1001 - 1635
VGNXS07-03-002	2		1001	2241	Complete	
VGNXS07-12-003	3		1001	1617	Complete	No E33 record sp's: 981, 1122, 1133-1136, 1311 sp 1122 has duplicate shot
VGNXS07-19-004	4		1001	1686	Complete	Bend at tail end of cable at SOL reason for high stretch/rotation values. Depths inserted sp's 1416 - 1686
VGNXS07-11-005	5		1001	1609	Complete	
VGNXS07-18-006	6		1001	1675	Complete	Depths inserted sp's 1346-1675
VGNXS07-08-007	7		1001	1520	Complete	
VGNXS07-20-008	8		1001	1644	Complete	Depths inserted sp's 1374 - 1644
VGNXS07-07-009	9		1001	1405	Complete	
VGNXS07-02-010	10		1001	2022	Complete	
VGNXS07-06-011	11		1001	2200	Complete	disabled noisy compass S1C6. Depths inserted sp's 1001 - 1586
VGNXS07-09-012	12		1001	1590	Complete	
VGNXS07-21-013	13		1001	1651	Complete	Depths inserted 1433 - 1651
VGNXS07-10-014	14		1001	1761	Complete	Lost E/S bottom Near EOL
VGNXS07-22-015	15		1001	1662	NTBP	Shutdown early d/t whales
VGNXS07-01-016	16		1001	1553	Complete	Compass averaging filter expanded to 45sec from 30sec d/t noisy data. Compass 3,6,9,12,14,16 fail compass bias d/t noisy data
VGNXS07-31-017	17		1001	1644	Complete	
VGNXS07-22-018	18		1001	1662	Complete	
VGNXS07-17-019	19		1001	1666	Complete	Depths inserted sp's 1427 - 1666
VGNXS07-13-020	20		1001		NTBP	Line aborted d/t whales
VGNXS07-13-021	21		1001	1627	Complete	
VGNXS07-23-022	22		1001	1672	Complete	Depths inserted sp's 1438 - 1672

VGNXS07-14-023	23		1001	1637	Complete	
VGNXS07-24-024	24		1001	1681	Complete	Depths inserted sp's 1393 - 1681
VGNXS07-15-025	25		1001	1647	Complete	Depths inserted sp's 1001 - 1237
VGNXS07-25-026	26		1001	1691	Complete	Depths inserted sp's 1368 - 1691
VGNXS07-32-027	27		1001	1644	Complete	Depths inserted sp's 1001 - 1077
VGNXS07-26-028	28		1001	1701	Complete	Depths inserted sp's 1577 - 1701
VGNXS07-33-029	29		1001	1140	NTBP	Line aborted d/t whale sighting
VGNXS07-33-030	30		1001	1695	Complete	Depths inserted sp's 1001 - 1106
VGNXS07-27-031	31		1001	1712	Complete	Depths inserted sp's 1497 - 1712
VGNXS07-16-032	32		1001	1656	Complete	Depths inserted sp's 1001 - 1164
VGNXS07-04-033	33		1001	2232	Complete	Depths inserted sp's 1782 - 2232
VGNXS07-47-034	34		1001	1538	Complete	Depths inserted sp's 1001 - 1172
VGNXS07-40-035	35		1001	1700	Complete	Compasses 3,9,16,17,18 fail compass bias testing d/t noisy data/weather. Depths inserted sp's 1262 - 1700
VGNXS07-46-036	36		1001	1590	Complete	Depths inserted sp's 1001-1252
VGNXS07-41-037	37		1001	1642	Complete	Depths inserted sp's 1246-1642
VGNXS07-43-038	38		1001	1643	Complete	Depths inserted sp's 1001-1206
VGNXS07-37-039	39		1001	1698	Complete	Depths inserted sp's 1331-1698
VGNXS07-44-040	40		1001	1590	Complete	Depths inserted sp's 1001-1168
VGNXS07-38-041	41		1001	1704	Complete	Depths inserted sp's 1350-1704
VGNXS07-45-042	42		1001	1589	Complete	Depths inserted sp's 1001-1180
VGNXS07-39-043	43		1001	1713	Complete	averaging filter of 45 seconds used on compass filtering instead of 30 sec d/t noisy data compass 3,9,16,18 failing compass bias d/t bad weather. Depths inserted sp's 1340-1713
VGNXS07-30-044	44		1001	1643	Complete	High stretch at SOL d/t large feather Multifix 2 & 4 rejected in processing d/t high Unit Variance. Depths inserted sp's 1001 - 1062
VGNXS07-34-045	45		1001	1692	Complete	Depths inserted sp's 1427-1692
VGNXS07-28-046	46		1001	1644	Complete	Depths inserted sp's SOL-EOL

VGNXS07-35-047	47		1001	1689	Complete	Depths inserted sp's 1306-1689
VGNXS07-29-048	48		1001	1644	Complete	Depths inserted sp's 1001-1202
VGNXS07-36-049	49		1001	1693	Complete	rejected S1C17 d/t high bias Depths inserted sp's 1300-1693
VGNXS07-42-050	50		1001	1643	Complete	Depths inserted sp's 1001-1245

15.4. Calibrations and tests

FUGRO SURVEY AS

Report on DGPS Verification, Tail Buoy Verification and Gyro Calibration
On M.V. Pacific Titan at Loyang Jetty, Singapore



1 ABSTRACT

Fugro Survey Pte Ltd was requested under the terms of its service contract with Fugro Survey AS, to undertake calibration of Gyrocompasses, Tail Buoy verification and verification of the Positioning Systems onboard M.V. Pacific Titan.

This project was undertaken on the 4th October 2006, whilst M.V. Pacific Titan was alongside at Loyang Wharf, Singapore.

Results of the Gyro Calibration, Tail Buoy Verification and DGPS Verification are detailed below:

• Gyro Calibration

Gyrocompass (160°)	Mean C-O	Mean S.D.
Tokyo Keiki MK ES	(+) 5.075°	0.107
Simrad HS 50	(+) 1.485°	0.794

Gyrocompass (340°)	Mean C-O	Mean S.D.
Tokyo Keiki MK ES	(+) 5.149°	0.077
Simrad HS 50	(+) 1.449°	0.387

Note: Tokyo Keiki gyro compass had a large C-O. This was made known to the chief navigator onboard during the calibration.

Simrad HS50 gyro was unstable. This was also made known to the chief navigator during the calibration.

• DGPS Verification

DIFFERENCE BETWEEN DGPS AND OBSERVED CO-ORDINATES				
	EASTING		NORTHING	
GPS Ant	Mean C-O	Mean S.D.	Mean C-O	Mean S.D.
MRDGPS	(-) 0.411m	0.193	(+) 0.576m	0.211
MultiFix 1	(-) 0.385m	0.299	(+) 0.337m	0.221
MultiFix 2	(-) 0.386m	0.304	(+) 0.489m	0.215





• Tail Buoy Verification

DIFFERENCE BETWEEN COMPUTED AND OBSERVED RGPS RANGE AND BEARING				
PODS	Bearing		Distance	
	Mean C-O	Mean S.D.	Mean C-O	Mean S.D.
1313	(+) 0.018°	0.153	(+) 0.640m	0.407
1518	(-) 0.347°	0.317	(-) 0.004m	0.414
1571	(-) 0.239°	0.407	(-) 0.434m	0.557
1260	(-) 0.355°	0.153	(+) 1.215m	0.212
1575	(-) 0.114°	0.439	(+) 0.055m	0.658
1314	(-) 0.471°	0.346	(+) 1.236m	0.517
1503	(-) 0.918°	0.154	(+) 0.656m	0.281
0869	(+) 0.016°	0.108	(-) 0.025m	0.309
1320	(-) 0.552°	0.811	(+) 1.039m	1.623
1335	(+) 0.394°	0.384	(-) 1.516m	1.118
1511	(-) 0.394°	0.280	(-) 0.068m	0.690

Note: Unless otherwise stated, all Geographical and Grid Co-ordinates, quoted in this report, have been referred to the WGS-84 Spheroid and Datum using the Universal Transverse Mercator Zone 48 North Grid Projection.





2 PROJECT OVERVIEW

2.1 Scope of Work

This Project's scope of work comprised:

- Calibration of M.V. Pacific Titan two gyrocompasses, referenced to an established baseline.
- Verification of three positioning systems onboard M.V. Pacific Titan with reference to established survey control points and terrestrial baseline.
- Verification of eleven tall buoys.
- Compilation of this Calibration Report.

2.2 Personnel

The following Fugro personnel were involved in the project:

Alex Teo	Surveyor
Yap Ber Tong	Surveyor
Vincent Ngeow	Surveyor

2.3 Equipment

The following equipment were used for the calibrations:

- 1 x Sokkia Set 2C Total Station
- 4 x Sets Prism Reflectors
- 2 x Survey tripods
- 1 x Measuring Tape
- 1 x Scientific Calculator



FUGRO SURVEY AS

Report on DGPS Verification, Tall Buoy Verification and Gyro Calibration
On M.V. Pacific Titan at Loyang Jetty, Singapore



3 GEODETIC PARAMETERS

3.1 Spheroid and Datum

Spheroid	:	WGS 84
Datum	:	WGS 84
Semi major axis	:	6 378 137.000 m
Inverse flattening	:	298.257 223 563
Units	:	International Metres

3.2 Projection

Projection	:	Universal Transverse Mercator (UTM)
Zone	:	48 North
Longitude of Central Meridian	:	105° E
Latitude of Origin Projection	:	0° N
False Easting	:	500 000 m
False Northing	:	0 m
Scale Factor	:	0.9996
Units	:	International Metres
Convergence	:	World Standard



4 SURVEY PROCEDURES

4.1 Survey Control Stations

Survey Origin

Six survey markers, PC1 to PC6, were established in August 2004. GPS instruments were set up over each marker and data (dual frequency data L1 and L2) were collected for a period of 45 minutes at each station. The data were post processed using Singapore Land Survey Authority Reference Stations, SEMB, KEPC, LOYA and NTU0.

A total station was set up at each of the survey marker (PC1 to PC6) including two existing markers (GPS81 and GPS83). Angles and distances were measured to all inter-visible markers. These data were incorporated into the GPS derived coordinates by using STAR*NET Least Square program to produce the final coordinates of the eight stations.

In addition to the above, Sun Observation was carried out on 11th and 12th August 2004 between station PC2 and PC3. The Altitude Method of computation was used and a total of twenty shots to the sun were observed over two days. The computed difference between the Sun Observation and GPS derived True Bearing was 00° 00' 06".

4.2 Gyrocompass

Following Fugro standard work practice, the vessel's heading was derived from a set of 20 range and bearing observations made to Geodetic targets/prisms located: on the bow; and at the stern, along the centre line of the vessel from control station GPS83. The reference object was control station PC3. Throughout the observing period, the gyro heading was logged at 1 second intervals. (Refer to [Appendix D](#))

4.3 DGPS Position

For the DGPS verification, the Geodetic target/prism was placed at MultiFix 1 (Starboard antenna). 20 range and bearing observations were made to the prism from control station GPS83. Throughout the observing period, the DGPS data was logged at 1 second intervals. (Refer to [Appendix E](#))

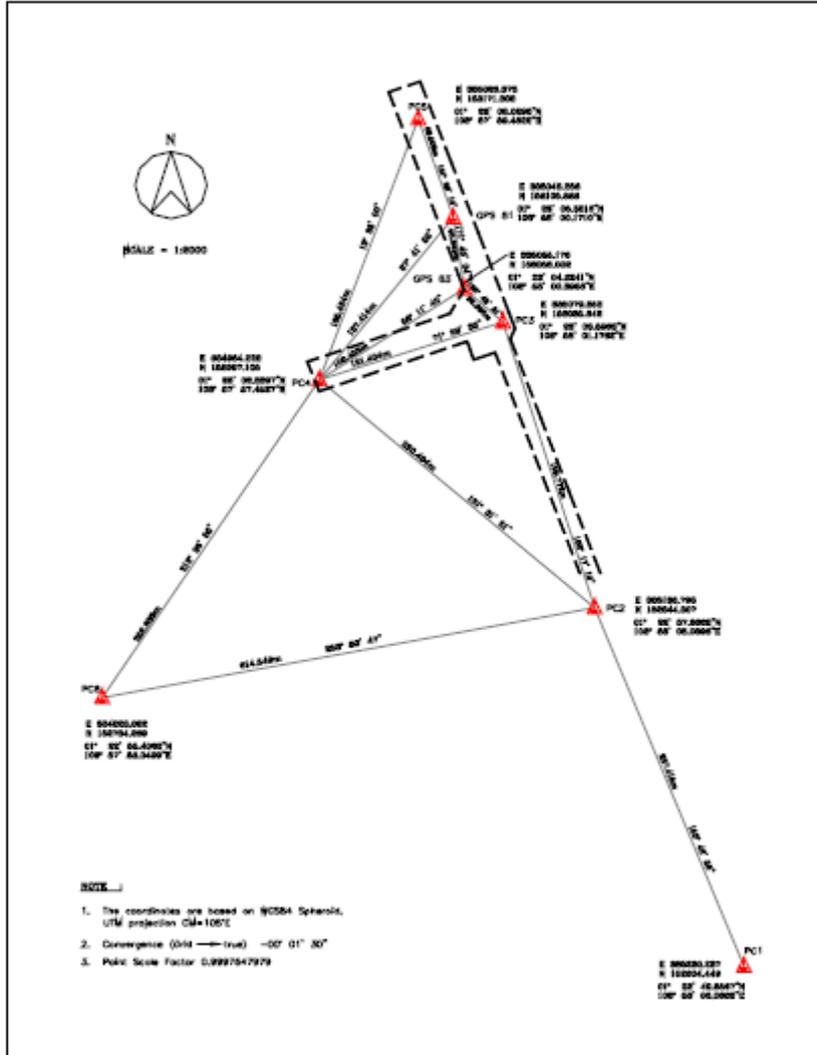
4.4 Tail Buoy

For Tail Buoy verification, the Geodetic target/prism was placed at MultiFix 1 (Starboard antenna). The position of each tail buoy was observed using range, bearing and vertical angle from station GPS83. 20 range, bearing and vertical angle observations were made to the prism from control station GPS83. Throughout the observing period, the slant range and true bearing data were logged at 1 second intervals. (Refer to [Appendix F](#))



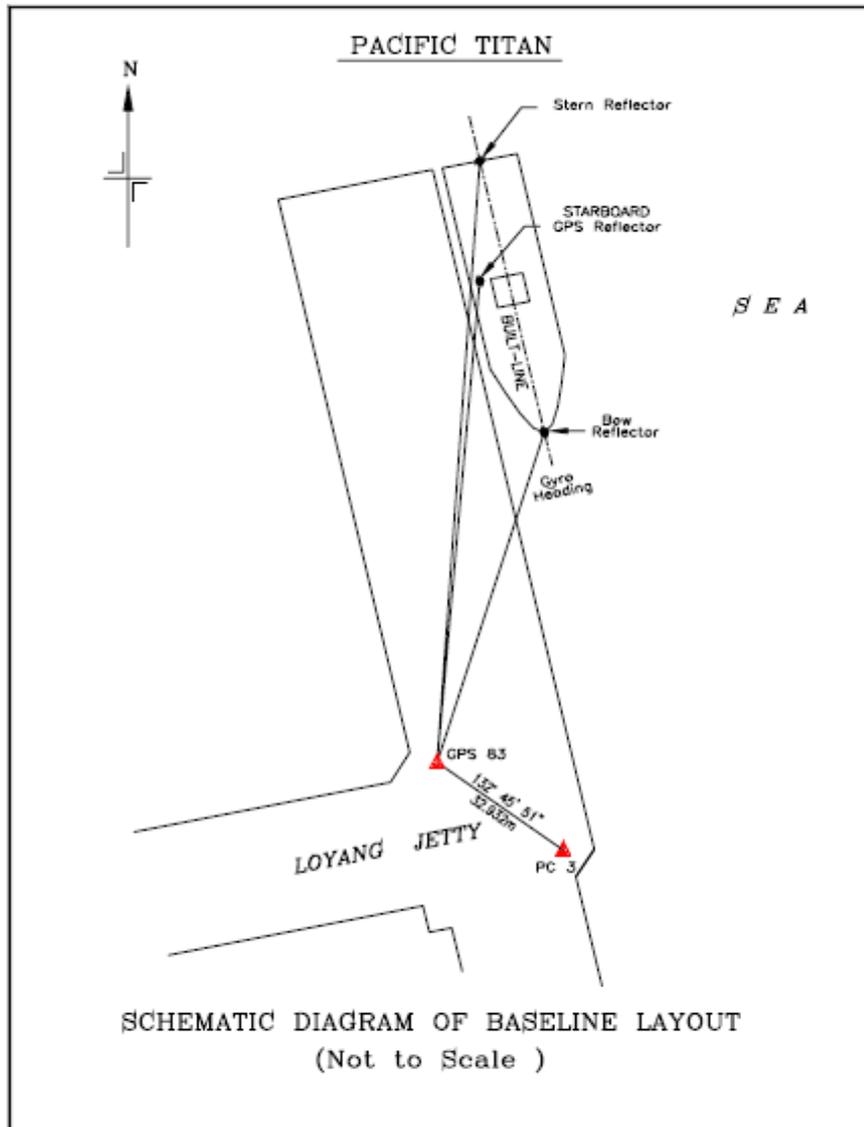
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On M.V. Pacific Titan at Loyang Jetty, Singapore



ECHOSOUNDER CALIBRATION - m/v. PACIFIC TITAN

Alongside:- **New Plymouth, New Zealand**

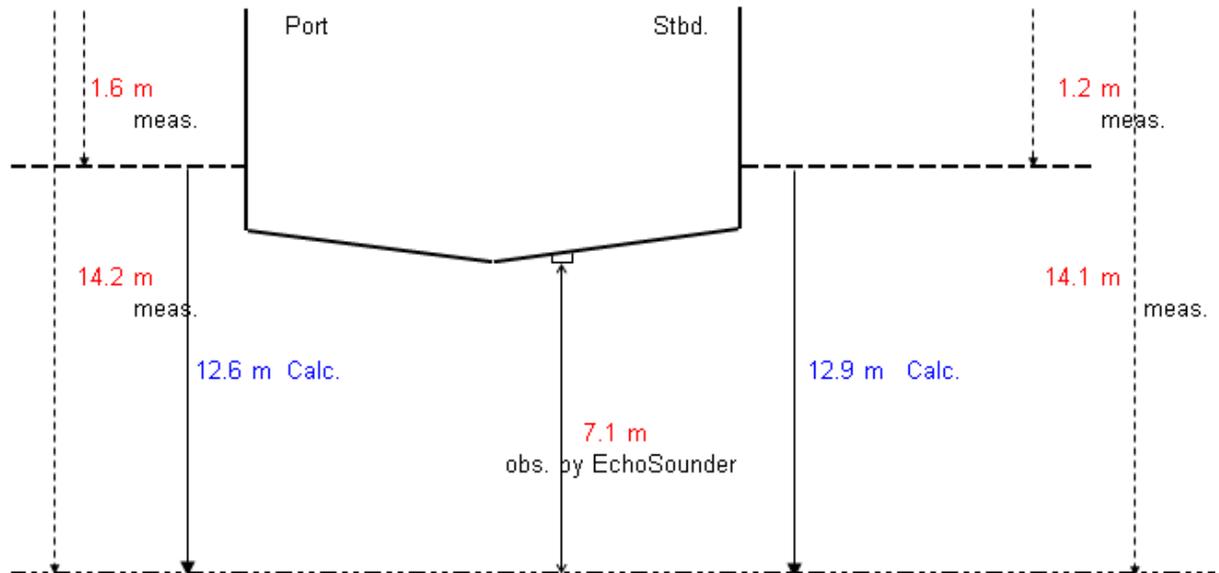
Date: **23 May 07**

Time: **04:50** GMT **13:30 Local Time**

Job #: **6304**

Client: **Pogo 3D**

Measurements taken:-	metres		
Port Freeboard		1.6	Stbd Freeboard
Port Lead-Line		14.2	Stbd Lead-Line
EchoSounder Reading		7.1	Port Draught marks:
Time		04:50	Stbd Draught marks:



Draught Marks:
 Stbd : 5.4 m
 Port : 5.8 m Theoretical Draught = 5.6 m

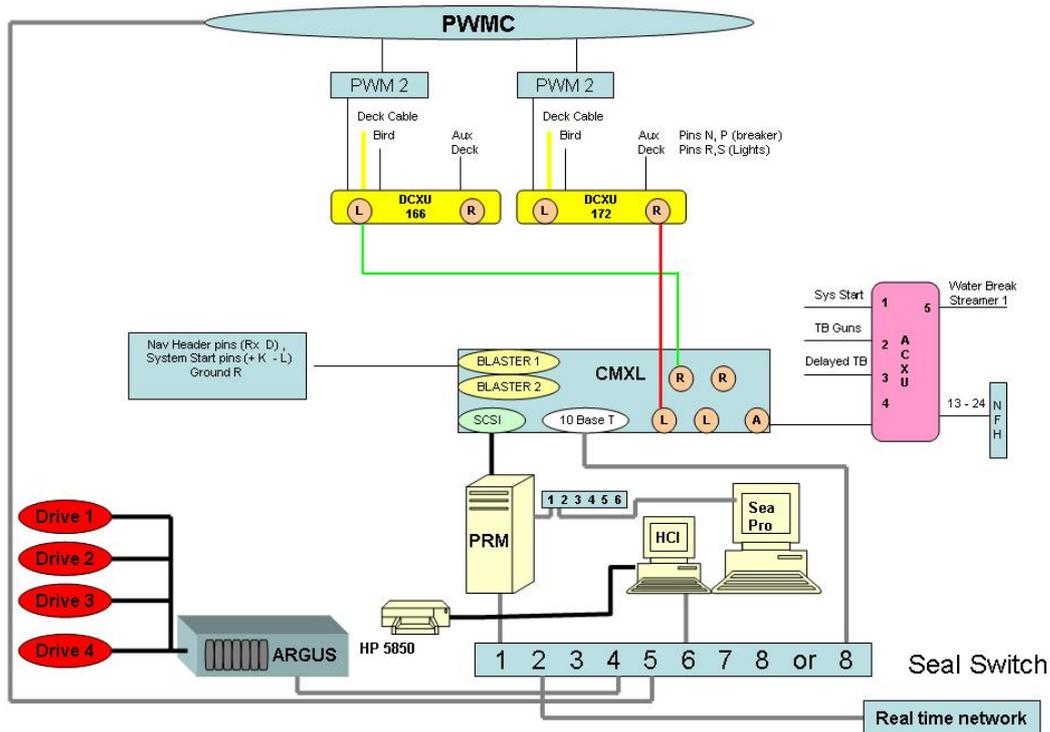
Electronic Depth + Theoret. Draught 12.7 m
 True Measured Water depth = 12.8 m

Difference = -0.1 m

TEXT = Measured
 TEXT = Calculated
 TEXT = Observed
 TEXT = Results

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16. Instrumentation and QC System Description



Unit Type	Manufacturer	Software version
Recording	Sercel Seal	Version 5.1.14
Argus	Profocus: Raid disk and data management	Version 4.0
Tape drives	IBM 3590E	
Plotter	Versatech 24inch	
Onboard QC	Seal Seapro QC and ARGUS QC	Version 4.0
Source Controller	Seamap Gunlink 2000	Version 2.4.2
Auxiliary Systems	48 channel (Sercel AXCU)	
Bird Controller	Digicourse DMU + PC	Sys 3v01
Bird Type	Digicourse 5011E	Sys 3v01

17. Instrumentation and QC tests

17.1. Start-up tests

Before the beginning of the survey started, and after the streamer was deployed, a complete set of instrument/sensors tests were performed.

These tests were as follows:

Instrument tests

- 1 Harmonic distortion
- 2 System noise
- 3 Common mode rejection ratio
- 4 Gain error/ phase error
- 5 Cross talk

Sensor tests

- 6 Hydrophone capacitance
- 7 LF cut-off
- 8 Leakage resistance

At the start of the survey a complete set of instrument tests were performed and sent to the processing centre together with the seismic data. The result of the Start of Job Instrument/Sensor tests was Ch. 135 failed Leakage.

17.2. Additional client tests

Polarity tests were carried out at the start of contract and verified on Promax. Streamer 1 Ch. 83 had reverse polarity.

17.3. Daily Instrument and Sensor tests

The daily instrument and sensor tests consisted of the same 8 tests which were used to verify the Seal and Streamers performance at the Start and throughout the contract. Results were printed out daily and also recorded to tape at start-up and end of contract. These tests were run daily to confirm that the Seal recording system and streamer performance were in specification.

The series of tests results showed the recording system to be in specification throughout the survey. The overall system performance was stable throughout the survey with test performance repeatable from day to day.

17.3.1. Seal tests performed daily

The following page shows the tests performed daily and their results.

Instrument tests

- 1 Harmonic distortion
- 2 System noise
- 3 Common mode rejection ratio
- 4 Gain error/ phase error
- 5 Cross talk

Sensor tests

Nexus Energy Ltd

- 6 Hydrophone capacitance
- 7 LF cut-off
- 8 Leakage resistance

17.3.2. Seal system and streamer test results

Streamer 1

Date	System tests						Sensor tests			Remarks
	HD	Sys noise	CMRR	Gain err	X talk odd	X talk even	Cap	LF cut-off	Leakage	
14-Jun-07	OK	OK	OK	OK	OK	OK	OK	OK	1	SOJ test / Ch. 135 fails leakage test
15-Jun-07	OK	OK	OK	OK	OK	OK	OK	OK	1	Ch. 226 fails leakage test.
16-Jun-07	OK	OK	OK	OK	OK	OK	OK	OK	2	Ch. 135 & 226 fails leakage test.
17-Jun-07	OK	OK	OK	OK	OK	OK	OK	OK	1	Ch. 226 fails leakage test.
18-Jun-07	OK	OK	OK	OK	OK	OK	OK	1	1	Ch. 226 fails Cutoff. Ch. 226 fails leakage test.
	-	-	-	-	-	-	-	-	-	No Tests 19th to 21st June, down for weather, streamer onboard
22-Jun-07	OK	OK	OK	OK	OK	OK	OK	1	1	Ch. 226 fails Cutoff. Ch. 135 fails leakage test.
23-Jun-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
24-Jun-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
25-Jun-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
26-Jun-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
										No Tests 27th June to 01st July, due to crew change and down for weather, streamer onboard
02-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
03-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
04-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
05-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
06-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
07-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
08-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
09-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
10-Jul-07	OK	OK	OK	OK	OK	OK	OK	2	2	Ch. 203 & 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
11-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
12-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
13-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
14-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
15-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
16-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.
17-Jul-07	OK	OK	OK	OK	OK	OK	OK	1	2	EOJ TEST Ch. 226 fails Cutoff. Ch. 135 & 226 fails leakage test.

17.3.3. End of job test

At the end of the survey a complete set of instrument tests were performed. These tests were as follows:

Instrument tests

- 1 Harmonic distortion
- 2 System noise
- 3 Common mode rejection ratio
- 4 Gain error/ phase error
- 5 Cross talk

Sensor tests

- 6 Hydrophone capacitance
- 7 LF cut-off
- 8 Leakage resistance

The tests listed above were recorded to tape, and sent to the processing centre together with the Seismic data.

The result of the End of Job Instrument/Sensor tests were, Ch. 226 failed Cutoff. Chs. 135 & 226 failed Leakage.

The overall Seal and Solid streamer system performance was stable and repeatable throughout the survey.

17.3.4. QC Processes

Seismic Observer QC displays

Seal system QC displays showing shot records and rms residual noise were used to monitor seismic data shot by shot. RMS levels were colour scaled to give good visual assessments to the operator of sea swell and ship noise effects on the streamer.

QC products and processing sequence

A Promax system was in use during the survey to further monitor the quality of the Seismic data, and to produce Gathers, Brute and Raw stacks.

17.3.5. Production tape logs

Client				BOX 1				
Area				Vessel M/V Pacific Titan				
Survey								
Job #								
Nexus Energy		VIC P/49 SE Australia						
Deep Water 2D								
6318								
Date	Line Name	Tape	Seq	FF	LF	FSP	LSP	Comments
14 June 2007	VGNXS07-74-001	1	1	979	1286	981	1285	SOL/EOL
14 June 2007	VGNXS07-74-002	2	2	979	1996	1106	2120	SOL/EOL
14 June 2007	VGNXS07-79-003	3	3	979	2091	981	2091	SOL
14 June 2007	VGNXS07-79-003	4	3	2092	2192	2092	2191	EOL
14 June 2007	VGNXS07-84-004	5	4	979	1436	981	1436	SOL/EOL
14 June 2007	VGNXS07-84-005	6	5	1295	2294	1297	2293	SOL/EOL
15 June 2007	VGNXS07-80-006	7	6	979	2091	981	2091	SOL
15 June 2007	VGNXS07-80-006	8	6	2092	2180	2092	2179	EOL
15 June 2007	VGNXS07-77-007	9	7	979	2091	981	2091	SOL
15 June 2007	VGNXS07-77-007	10	7	2092	2129	2092	2128	EOL
15 June 2007	VGNXS07-81-008	11	8	979	2091	981	2091	SOL
15 June 2007	VGNXS07-81-008	12	8	2092	2193	2092	2192	EOL
15 June 2007	VGNXS07-85-009	13	9	979	2091	981	2091	SOL
15 June 2007	VGNXS07-85-009	14	9	2092	2286	2092	2285	EOL
16 June 2007	VGNXS07-90-010	15	10	979	2091	981	2091	SOL
16 June 2007	VGNXS07-90-010	16	10	2092	2205	2092	2204	EOL
16 June 2007	VGNXS07-87-011	17	11	979	2091	981	2091	SOL
16 June 2007	VGNXS07-87-011	18	11	2092	2279	2092	2278	EOL
16 June 2007	VGNXS07-91-012	19	12	979	2091	981	2091	SOL
16 June 2007	VGNXS07-91-012	20	12	2092	2203	2092	2202	EOL
16 June 2007	VGNXS07-94-013	21	13	979	2052	981	2051	SOL/EOL
16 June 2007	VGNXS07-49-014	22	14	979	2091	981	2091	SOL
16 June 2007	VGNXS07-49-014	23	14	2092	2209	2092	2208	EOL
17 June 2007	VGNXS07-51-015	24	15	979	2091	981	2091	SOL
17 June 2007	VGNXS07-51-015	25	15	2092	2235	2092	2234	EOL
17 June 2007	VGNXS07-53-016	26	16	979	2091	981	2091	SOL
17 June 2007	VGNXS07-53-016	27	16	2092	2814	2092	2813	EOL
17 June 2007	VGNXS07-56-017	28	17	979	2091	981	2091	SOL
17 June 2007	VGNXS07-56-017	29	17	2092	2649	2092	2648	EOL
17 June 2007	VGNXS07-54-018	30	18	979	2091	981	2093	SOL

Client				BOX 2				
Area				Vessel M/V Pacific Titan				
Survey								
Job #								
Nexus Energy		VIC P/49 SE Australia						
Deep Water 2D								
6318								
Date	Line Name	Tape	Seq	FF	LF	FSP	LSP	Comments
18 June 2007	VGNXS07-54-018	31	18	2092	2820	2094	2817	EOL
18 June 2007	VGNXS07-52-019	32	19	979	1522	981	1521	SOL / Incomplete
22 June 2007	VGNXS07-52-020	33	20	1380	2492	1382	2492	SOL
22 June 2007	VGNXS07-52-020	34	20	2493	2748	2493	2747	EOL
22 June 2007	VGNXS07-50-021	35	21	979	2091	981	2091	SOL
22 June 2007	VGNXS07-50-021	36	21	2092	2282	2092	2281	EOL
22 June 2007	VGNXS07-48-022	37	22	979	2059	981	2058	SOL / EOL
22 June 2007	VGNXS07-93-023	38	23	989	2094	991	2094	SOL / EOL
23 June 2007	VGNXS07-95-024	39	24	979	1761	981	1760	SOL / EOL
23 June 2007	VGNXS07-92-025	40	25	979	2091	981	2091	SOL
23 June 2007	VGNXS07-92-025	41	25	2092	2021	2092	2020	EOL
23 June 2007	VGNXS07-86-026	42	26	979	2091	981	2091	SOL
23 June 2007	VGNXS07-86-026	43	26	2092	2294	2092	2293	EOL
23 June 2007	VGNXS07-83-027	44	27	979	2091	981	2091	SOL
23 June 2007	VGNXS07-83-027	45	27	2092	2180	2092	2179	EOL
24 June 2007	VGNXS07-88-028	46	28	979	2091	981	2091	SOL
24 June 2007	VGNXS07-88-028	47	28	2092	2214	2092	2213	EOL
24 June 2007	VGNXS07-82-029	48	29	979	2091	981	2091	SOL
24 June 2007	VGNXS07-82-029	49	29	2092	2266	2092	2265	EOL
24 June 2007	VGNXS07-89-030	50	30	979	1437	981	1437	SOL
24 June 2007	VGNXS07-89-030	51	30	1438	2202	1438	2201	EOL
24 June 2007	VGNXS07-78-031	52	31	979	2091	981	2091	SOL
24 June 2007	VGNXS07-78-031	53	31	2092	2184	2092	2183	EOL
24 June 2007	VGNXS07-75-032	54	32	979	2091	981	2091	SOL
24 June 2007	VGNXS07-75-032	55	32	2092	2114	2091	2113	EOL
25 June 2007	VGNXS07-76-033	56	33	979	2091	981	2091	SOL
25 June 2007	VGNXS07-76-033	57	33	2092	2119	2092	2118	EOL
25 June 2007	VGNXS07-57-034	58	34	979	1980	981	1980	SOL / EOL
25 June 2007	VGNXS07-55-035	59	35	979	2091	981	2091	SOL
25 June 2007	VGNXS07-55-035	60	35	2092	2649	2092	2648	EOL

Client		Nexus Energy				BOX 3			
Area		VIC P/49 SE Australia				Vessel		M/V Pacific Titan	
Survey		Deep Water 2D							
Job #		6318							
Date	Line Name	Tape	Seq	FF	LF	FSP	LSP	Comments	
25 June 2007	VGNXS07-58-036	61	36	979	1723	981	1722	SOL/EOL	
26 June 2007	VGNXS07-60-037	62	37	979	1749	981	1748	SOL/EOL	
02 July 2007	VGNXS07-59-038	63	38	979	1037	981	1037	NTBP	
02 July 2007	VGNXS07-59-038	64	38	1038	1055	1038	1055	NTBP	
02 July 2007	VGNXS07-59-038	65	38	1056	1279	1056	1278	NTBP	
03 July 2007	VGNXS07-62-039	66	39	979	1745	981	1744	SOL/EOL	
03 July 2007	VGNXS07-59-040	67	40	979	1721	981	1718	SOL/EOL	
04 July 2007	VGNXS07-64-041	68	41	979	1737	981	1736	SOL/EOL	
05 July 2007	VGNXS07-73-042	69	42	979	1898	981	1897	SOL/EOL	
14 July 2007	VGNXS07-72-043	70	43	979	1424	981	1436	Incomplete	
14 July 2007	VGNXS07-72-044	71	44	1274	1898	1276	1897	Completed	
14 July 2007	VGNXS07-70-045	72	45	979	1769	981	1768	SOL/EOL	
14 July 2007	VGNXS07-68-046	73	46	979	1784	981	1783	SOL/EOL	
15 July 2007	VGNXS07-66-047	74	47	979	1751	981	1750	SOL/EOL	
15 July 2007	VGNXS07-61-048	75	48	979	1745	981	1744	SOL/EOL	
15 July 2007	VGNXS07-96-049	76	49	979	2057	981	2056	SOL/EOL	
15 July 2007	VGNXS07-97-050	77	50	979	2059	981	2058	SOL/EOL	
15 July 2007	VGNXS07-63-051	78	51	979	1749	981	1748	SOL/EOL	
16 July 2007	VGNXS07-67-052	79	52	979	1776	981	1775	SOL/EOL	
16 July 2007	VGNXS07-71-053	80	53	979	1897	984	1899	NTBP	
16 July 2007	VGNXS07-65-054	81	54	979	1747	981	1746	NTBP	
16 July 2007	VGNXS07-69-055	82	55	979	1479	981	1478	NTBP	
16 July 2007	VGNXS07-69-056	83	56	979	1773	981	1772	SOL/EOL	
16 July 2007	VGNXS07-65-057	84	57	979	1747	981	1746	SOL/EOL	
17 July 2007	VGNXS07-71-058	85	58	979	1900	984	1899	SOL/EOL	
END OF DEEP WATER SURVEY									

Client		Nexus Energy				BOX 4			
Area		VIC P/49 SE Australia				Vessel		M/V Pacific Titan	
Survey		Bronze 2D							
Job #		6318							
Date	Line Name	Tape	Seq	FF	LF	FSP	LSP	Comments	
05 July 2007	VGNXS07-05-001	1	1	979	2228	981	2227	SOL/EOL	
05 July 2007	VGNXS07-03-002	2	2	979	2242	981	2241	SOL/EOL	
06 July 2007	VGNXS07-12-003	3	3	979	1618	981	1617	SOL/EOL	
06 July 2007	VGNXS07-19-004	4	4	979	1687	981	1686	SOL/EOL	
06 July 2007	VGNXS07-11-005	5	5	979	1610	981	1609	SOL/EOL	
06 July 2007	VGNXS07-18-006	6	6	979	1676	981	1675	SOL/EOL	
06 July 2007	VGNXS07-08-007	7	7	979	1521	981	1520	SOL/EOL	
06 July 2007	VGNXS07-20-008	8	8	979	1645	981	1644	SOL/EOL	
07 July 2007	VGNXS07-07-009	9	9	979	1406	981	1405	SOL/EOL	
07 July 2007	VGNXS07-02-010	10	10	979	2023	981	2022	SOL/EOL	
07 July 2007	VGNXS07-06-011	11	11	979	2201	981	2200	SOL/EOL	
07 July 2007	VGNXS07-09-012	12	12	979	1591	981	1590	SOL/EOL	
07 July 2007	VGNXS07-21-013	13	13	979	1652	981	1651	SOL/EOL	
07 July 2007	VGNXS07-10-014	14	14	979	1762	981	1761	SOL/EOL	
08 July 2007	VGNXS07-22-015	15	15	979	1215	981	1214	NTBP	
09 July 2007	VGNXS07-01-016	16	16	979	1554	981	1553	SOL/EOL	
09 July 2007	VGNXS07-31-017	17	17	979	1645	981	1644	SOL/EOL	
09 July 2007	VGNXS07-22-018	18	18	979	1663	981	1662	SOL/EOL	
09 July 2007	VGNXS07-17-019	19	19	979	1667	981	1666	SOL/EOL	
10 July 2007	VGNXS07-13-020	20	20	979	1080	981	1079	NTBP	
10 July 2007	VGNXS07-13-021	21	21	979	1628	981	1627	SOL/EOL	
10 July 2007	VGNXS07-23-022	22	22	979	1673	981	1672	SOL/EOL	
10 July 2007	VGNXS07-14-023	23	23	979	1638	981	1637	SOL/EOL	
10 July 2007	VGNXS07-24-024	24	24	979	1682	981	1681	SOL/EOL	
10 July 2007	VGNXS07-15-025	25	25	979	1648	981	1647	SOL/EOL	
10 July 2007	VGNXS07-25-026	26	26	979	1692	981	1691	SOL/EOL	
11 July 2007	VGNXS07-32-027	27	27	979	1645	981	1644	SOL/EOL	
11 July 2007	VGNXS07-26-028	28	28	979	1702	981	1701	SOL/EOL	
11 July 2007	VGNXS07-33-029	29	29	979	1141	981	1140	NTBP	
11 July 2007	VGNXS07-33-030	30	30	981	1696	981	1695	SOL/EOL	

Client	Nexus Energy	 BOX 5 Vessel M/V Pacific Titan						
Area	VIC P/49 SE Australia							
Survey	Bronze 2D							
Job #	6318							
Date	Line Name	Tape	Seq	FF	LF	FSP	LSP	Comments
11 July 2007	VGNXS07-27-031	31	31	979	1713	981	1712	SOL/EOL
11 July 2007	VGNXS07-16-032	32	32	979	1657	981	1656	SOL/EOL
11 July 2007	VGNXS07-04-033	33	33	979	2233	981	2232	SOL/EOL
12 July 2007	VGNXS07-47-034	34	34	979	1539	981	1538	SOL/EOL
12 July 2007	VGNXS07-40-035	35	35	979	1701	981	1700	SOL/EOL
12 July 2007	VGNXS07-46-036	36	36	979	1591	981	1590	SOL/EOL
12 July 2007	VGNXS07-41-037	37	37	979	1643	981	1642	SOL/EOL
12 July 2007	VGNXS07-43-038	38	38	979	1644	981	1643	SOL/EOL
12 July 2007	VGNXS07-37-039	39	39	979	1699	981	1698	SOL/EOL
12 July 2007	VGNXS07-44-040	40	40	979	1591	981	1590	SOL/EOL
13 July 2007	VGNXS07-38-041	41	41	979	1705	981	1704	SOL/EOL
13 July 2007	VGNXS07-45-042	42	42	979	1590	981	1589	SOL/EOL
13 July 2007	VGNXS07-39-043	43	43	979	1714	981	1713	SOL/EOL
13 July 2007	VGNXS07-30-044	44	44	979	1644	981	1643	SOL/EOL
13 July 2007	VGNXS07-34-045	45	45	979	1693	981	1692	SOL/EOL
13 July 2007	VGNXS07-28-046	46	46	979	1646	981	1644	SOL/EOL
13 July 2007	VGNXS07-35-047	47	47	979	1690	981	1689	SOL/EOL
13 July 2007	VGNXS07-29-048	48	48	979	1645	981	1644	SOL/EOL
14 July 2007	VGNXS07-36-049	49	49	979	1694	981	1693	SOL/EOL
14 July 2007	VGNXS07-42-050	50	50	979	1644	981	1643	SOL/EOL
END OF BRONZE SURVEY								

17. Onboard Processing

Seismic processing software & equipment

Hardware	Supermicro Machine, built on SC833T-R760 Chassis X6DHE-X92 Dual Core Xenon 2x3.2GHz CPU 8 Gb Memory 1.6 Tb Disk
Peripheral units	IBM 3590B & IBM 3590E tape drives Thermal Plotter, V24 (B&W) 2 x 19 inch ViewSonic LCD Monitors
Software	Processing: ProMAX 2D 2003.12.1.1 Operating System: RedHat Enterprise WS 3.0 Update 6 Plotting: ZEH Plot Express 4.7.0

17.4. Personnel

14 th June 2007 - 27 th June 2007	Adam Gebarski Dennis Jerome Aquino	EPI, Senior Field Geophysicist Multiwave, Field Geophysicist
27 th June 2007 – 17 th July 2007	Nikolay Gorbunov Niels Büchler-Friis	EPI, Senior Field Geophysicist Multiwave, Field Geophysicist

Onshore processing support:

Christophe Massacand, Chief Operations Geophysicist
 Ronny Tømmerbakke, Support Geophysicist

17.5. Processing sequence

17.5.1. Processing Objectives

The main objective of the onboard QC processing was to identify problems associated with the data acquisition and recording. This included the assessment of noise in the data on a line by line basis in order to give an overall impression of the data quality.

Various QC methods, including RMS noise displays, single and multi-trace displays, and gun hydrophone channels were analysed to assess compliance with various acceptance criteria and to isolate any other acquisition issues.

The general aim of the QC processing was not to attenuate noise but to show the data as it was recorded, or how it would be presented to processing centre. A brute stack was produced for every line with minimal processing to enable a thorough QC of the data onboard. In addition to brute stack processing, gun hydrophone channels were checked to QC the performance of the source, near trace and Shot vs. Channel RMS displays were generated and examined to identify any noise problems.

17.5.2. Parameter Testing

Due to high production rates expected and short survey duration, parameter testing was kept to a minimum. There was little time lag between production and final QC. Parameter testing was therefore limited to checking suitability of the parameters on the first sequence, along with NMO mutes, and post stack scaling for the displays.

17.5.3. Processing Parameters

Upon completion of a line, the 'original' (or 'prime') tape was read to confirm its integrity. All SEG-D data on this tape were extracted from tape and written to the ProMAX system disk. A listing of the field file (FFID), shot point number (SP) and number of channels was printed to clearly identify any lost shots or shots with missing navigation headers. All data, including start and end-of line noise records and auxiliary channels (-1 to -24), were input. A bulk shift static correction was applied to the data to correct for the 50ms instrument delay of the recording system.

A 8500ms for Deep Water Area (6500ms for Bronze Whaler) trace length and a 2ms sample interval was used in the acquisition. The cable length was 6000 meters with hydrophone group separation of 12.5 meters. Sail lines followed the azimuths of 020°/200° and 101°/280°.

For QC purposes a nominal 2D geometry was applied to all the seismic trace data, and offset / CDP binning were then loaded into the seismic trace headers. The data was re-sampled from 2 ms to 4 ms, with a minimum phase, high fidelity anti-alias filter applied prior to resample. Further data reduction involved 2 to 1 Marine Trace Decimation after differential NMO, which increased the receiver spacing from 12.5 to 25 meters.

To balance the shot record, true amplitude recovery using a spherical divergence correction was used and applied to the whole shot record. Band pass filtering was also applied to the data, prior to NMO and stacking.

17.6. Acquisition quality control

This section describes the quality control steps that were taken. This acquisition QC allows for the onboard processors to find and log any potential problems with the other onboard departments, in order that the highest possible standards of acquisition are maintained.

The onboard QC includes a full set of quality controls used to detect seismic and positioning problems.

17.7. QC processing steps

STEP	DETAILS	QC PROCEDURE/PRODUCT
Reformat to ProMAX internal format	Input full length record - 8500ms(Deep Water) or 6500ms(Bronze Whaler), 480 channels + 24 auxiliary channels	Check Job Listing for FFID/Shot numbering, Gun Seq, Main headers. Check for missing Data
Noise Record	Start And End Of Line. Ambient RMS Calculation	Check screen display and noise level Screen capture 1 record
Noise History	Append Noise Calculation to History	Screen capture Noise History - End of Job
Raw Shots Display	Every 2km, 480 channels 8500ms(Deep Water) or 6500ms(Bronze Whaler)	Check Channel Edits Check Data Quality
Auxiliary Channel QC	Create Aux Channel Gathers Vertical Stack Gun Hydrophones for each Gun string	QC of Aux Channels Check for autofires, gun timing, air leaks
Near Trace Display	Select First Channel and Display	Check record length, data quality Screen capture
Shot vs Chan RMS Analysis	<ul style="list-style-type: none"> Ormsby, Zero Phase, 4-8-90-120 Hz BPF applied. 2 Windows. For Deep Water. 2500-3000ms & 6500-7000ms. For Bronze Whaler. 300-500ms & 6200-6400ms. Shot by shot Average Noise Calculation. 	Check levels against job specs Check for bad channels Screen capture for both displays
RMS History	Calculate Average for Sequence and append to RMS History File	Screen capture RMS History – End of Job
Trace Decimation Flow	<ul style="list-style-type: none"> Input Raw Shots Apply Shot and Channel Edits based on Observer Logs and QC -50ms static shift for Instrument Filter Delay Ormsby, Minimum Phase, 4-8-90-120 Hz Band Pass Filter Apply 2D Nominal Marine Geometry 	
Decimated shot display	Every 1250 m shot display on screen	Check shots

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STEP	DETAILS	QC PROCEDURE/PRODUCT
Velocity Analysis	Every 2 km, Semblance, Gathers, Variable Velocity Percentage Stack Panels	Pick velocities every 2km
Velocity QC	Start ProMAX Interactive Velocity QC and Editing tool.	Check velocity Field for Spikes and Picking errors. Display as Interval Velocities for additional QC
NMO gathers	Every 2km NMO CMP gathers on screen	Check moveout of primaries.
Export Vels	Export Velocity Table to ASCII	Save ASCII Vel file
Stack RMS Flow	Calculate water column RMS value for posting on top of the stack	
Stack Flow	<ul style="list-style-type: none"> • Input Decimated Shots • Sort to CMP order • Moveout with picked Velocity Field • Surgical NMO mute • 1/sqrt(n) fold compensated stack • Apply Gun and Cable Statics • 1/tv² amplitude recovery • Ormsby, Minimum Phase, 4-8-90-120 Hz Band Pass Filter 	<p>Check quality of stack</p> <p>Check completeness of Stack and corresponding SPs, FFIDs and CDPs</p> <p>Screen capture</p>
Stack Plot	Time Variable Amplitude Compensation	Check Deliverable Plot
SEG-Y stack	Write to SEG-Y	Save deliverable file
Nav Merge QC	Merge lead trace of each cable with P190. Calculate direct arrival time and display over Seismic Near Trace Gather.	Check that predicted Direct Arrival Time closely follows the seismic data. Check that all traces have merged successfully.
		End of Job

17.8. Noise Record and Channel RMS graph

The noise records have been done at the start and end of every line for QC purposes. Channel RMS values were computed for all 480 channels over the entire record for noise analysis. The example below shows noise at the head of the cable, as well as the swell noise in the middle part of the cable. RMS graph is on the top.

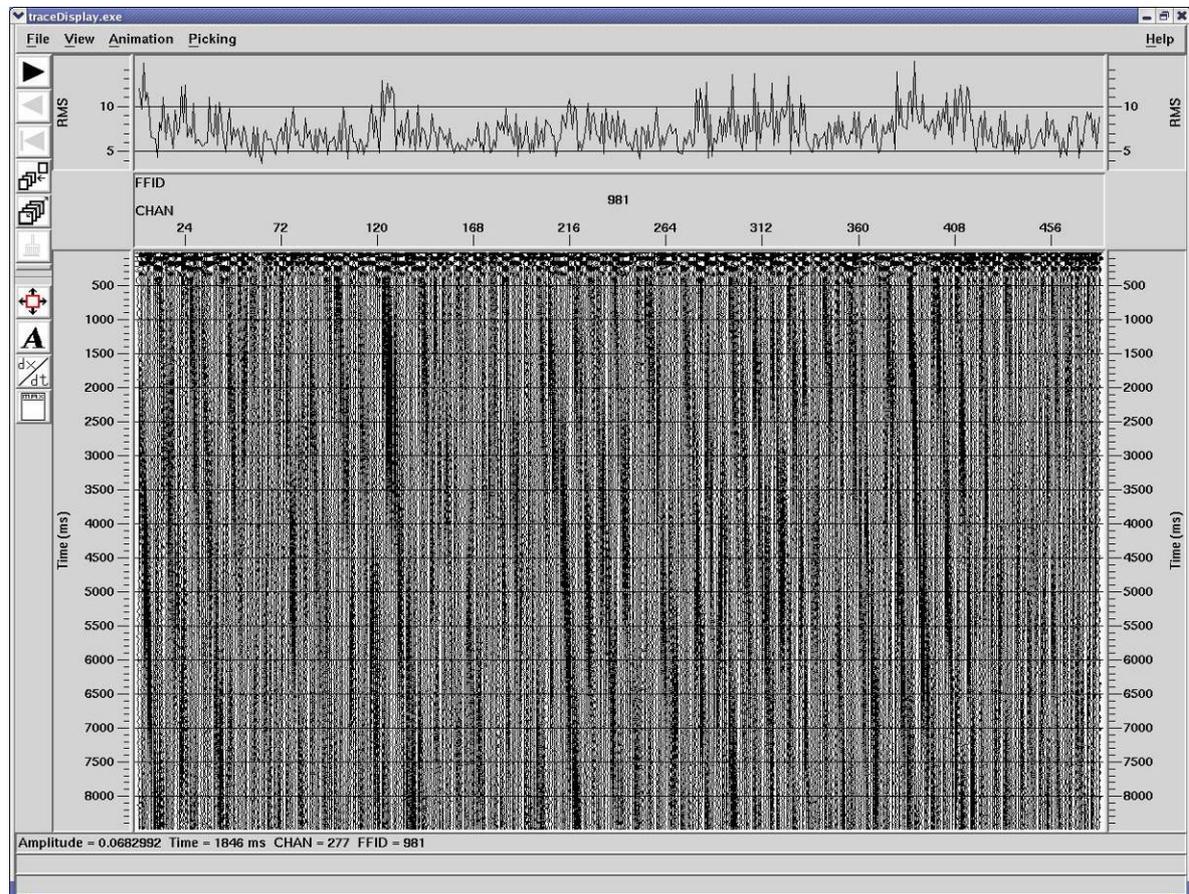


Figure 1. Noise Record with Channel RMS graph, Seq. 040 Deep Water Area.

17.9. Ambient noise - Shot Vs Channel RMS Display

Colour displays of Shot vs. Channel RMS values were produced for cable on every line. Raw data with a sample rate of 1 ms was used to calculate the RMS values for every channel on every shot. Two displays were produced:

1. RMS values for shallow window were displayed between 300-500ms for Bronze Whaler Area and from 2500-3000 ms for Deep Water Area at the start of the record. RMS values from all channels were averaged for each shot. They were displayed on the graph.

2. RMS values for deep window for Bronze Whaler Area were displayed between 6200-6400ms at the end of the record. RMS values from all channels were averaged for each shot. They were displayed on the graph. RMS values for middle window for Deep Water Area were displayed between 6200-6400ms at the end of the record. RMS values from all channels were averaged for each shot. They were displayed on the graph.

For all RMS computations a scaling factor of 46.5 was used to convert from millivolts to microbars, the instrument sensitivity being 21.5 Volts/Bar.

The shallow and deep colour RMS displays were viewed on screen, and screen images were then saved as GIF/JPG files. The displays were useful in showing noise trends along the line such as swell noise, noisy/bad channels, bird noise, cable tug, front end noise, cable strikes, auto-fires and misfires, multiple interference, etc. The on screen analysis also allowed the exact shot and channel location of any noise trend to be located and investigated

The shallow windows was overdriven for the first 50 channels and deep windows was overdriven from time to time for Bronze Whaler Area, as can be seen on the plot below (red bar at top of display and red spots on deep window). This is due to the shallow water of the survey area, and the impossibility of finding an adequate water column window at the top of the trace, free from the seismic impulse. This is also the case for Deep Water Area. So it was impossible to determine average values of ambient noise from rms displays.

To compare average noise values for each line the RMS analysis of the whole noise records was used. Amb_RMS ASCII format files can be found on the Deliverables DVD as well as the Excel Sheets for each area of the survey.

The noisy channels could be clearly identified on this displays. Any deteriorating channels could be spotted using this display.

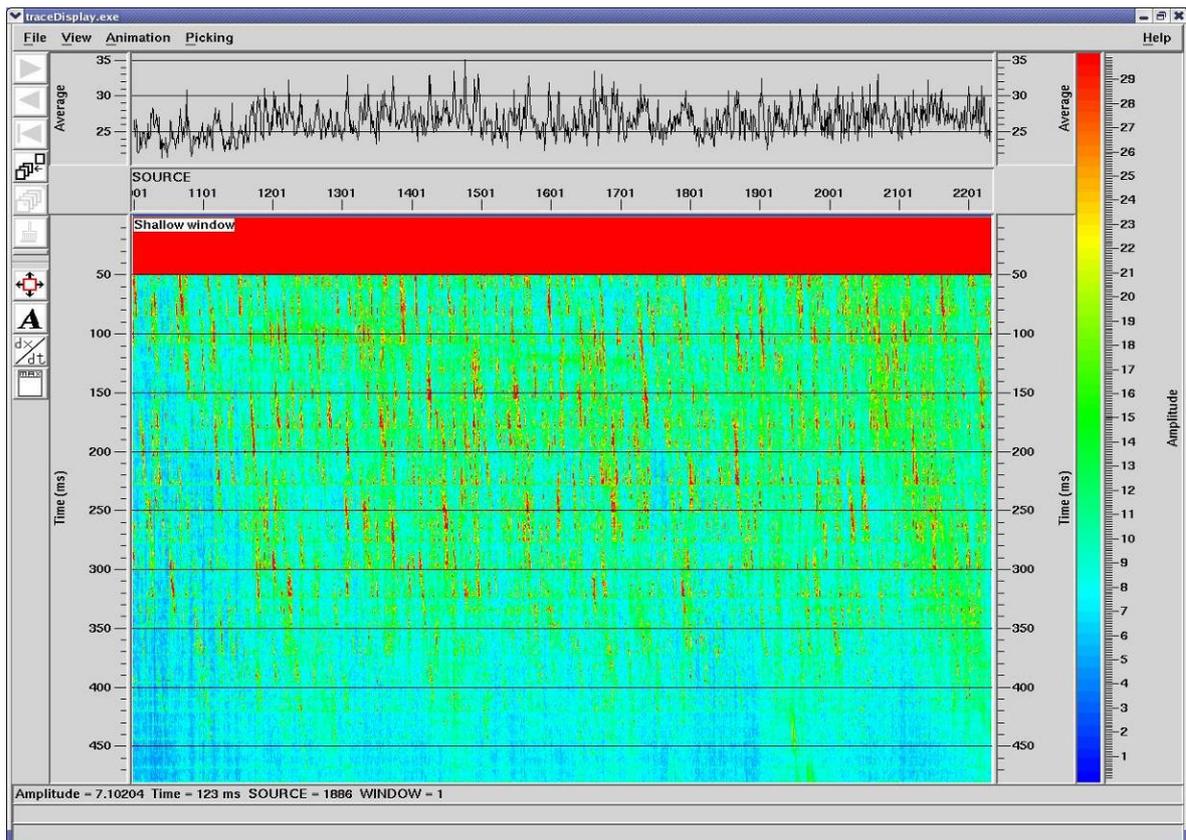
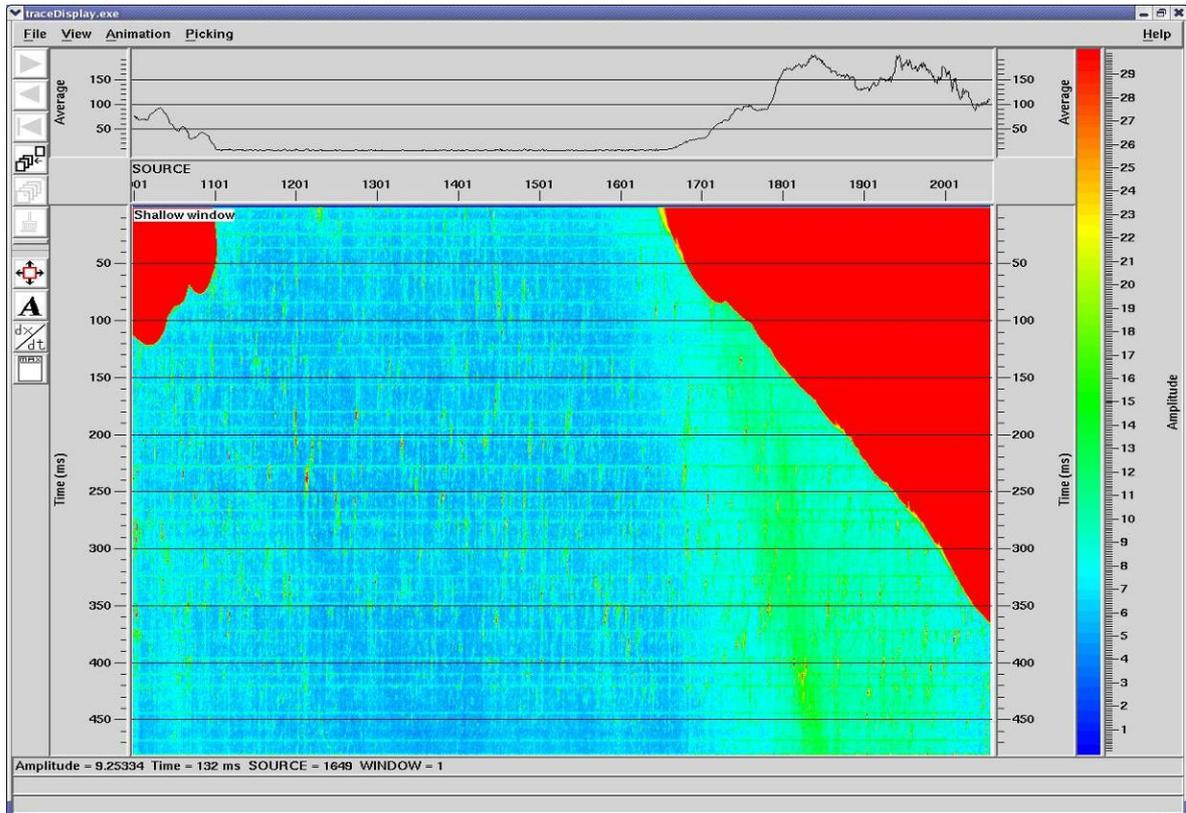
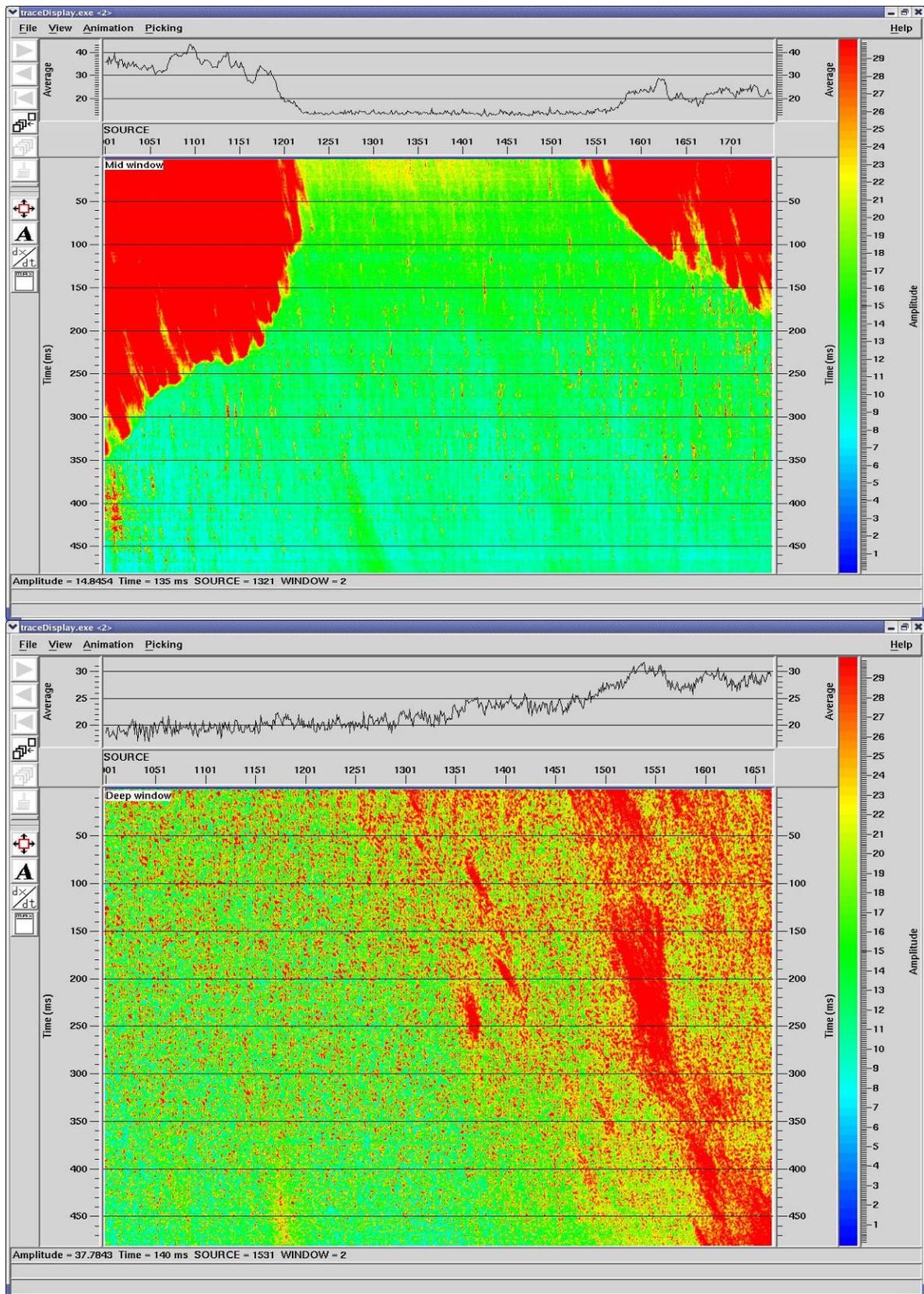


Figure 2. Examples of Shallow rms windows from Deep Water Area(top) and Bronze Whaler Area(bottom). They are overdriven with seismic impulse and the bottom one shows the presence of swell noise.



**Figure 3 Above Examples of Middle Rms window from Deep Water Area(top) and Deep Rms window from Bronze Whaler Area (bottom).
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17.10. Near Trace Display

Near trace gathers were displayed on screen for every line in order to quickly determine any possible errors in acquisition, e.g. gun volume changes, bad records, time-break problems and any autofires not reported by the recording system. The near traces also provided a good indication of strength of the water bottom multiples, residual seismic multiple energy, front end noise and swell noise contamination.

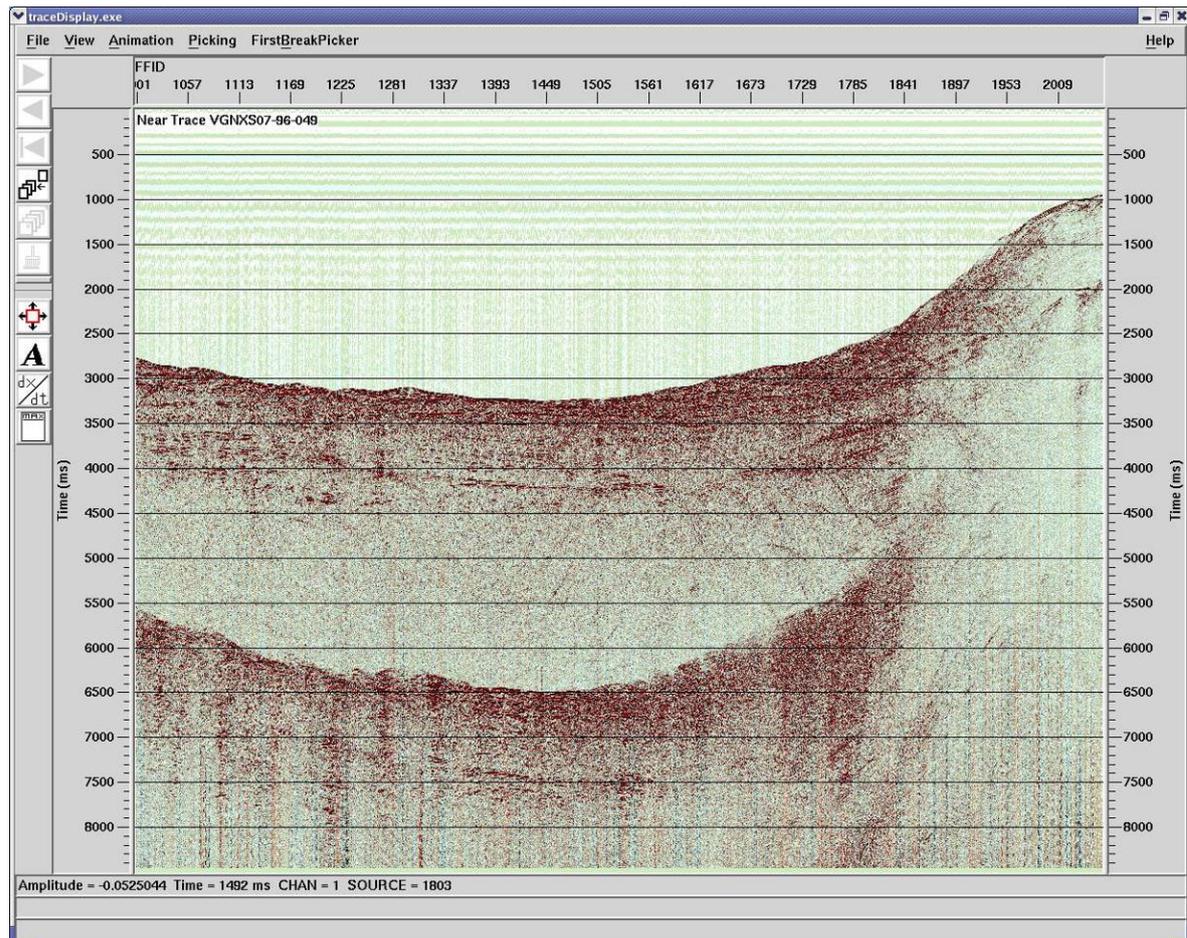


Figure 4. Near trace display, Sequence 049 Deep Water.

17.11. Auxiliary Channel QC

The 24 auxiliary channels loaded during the SEG-D read, were separated from the 960 data channels, stored in a separate data file, and used for on screen analysis. These records consisted of the time break, the water break, and 6 near-field hydrophones for the 2 sub-arrays. Time break and water break channels were displayed as a single trace display on screen. The first 250ms from all 3 hydrophones within each sub-array were stacked vertically and displayed. This proved useful in distinguishing genuine gun problems from noise on the trace.

All auxiliary channels data for hydrophones mounted on the guns was displayed in order to evaluate performance of the guns. These displays were useful in locating air leaks and autofires.

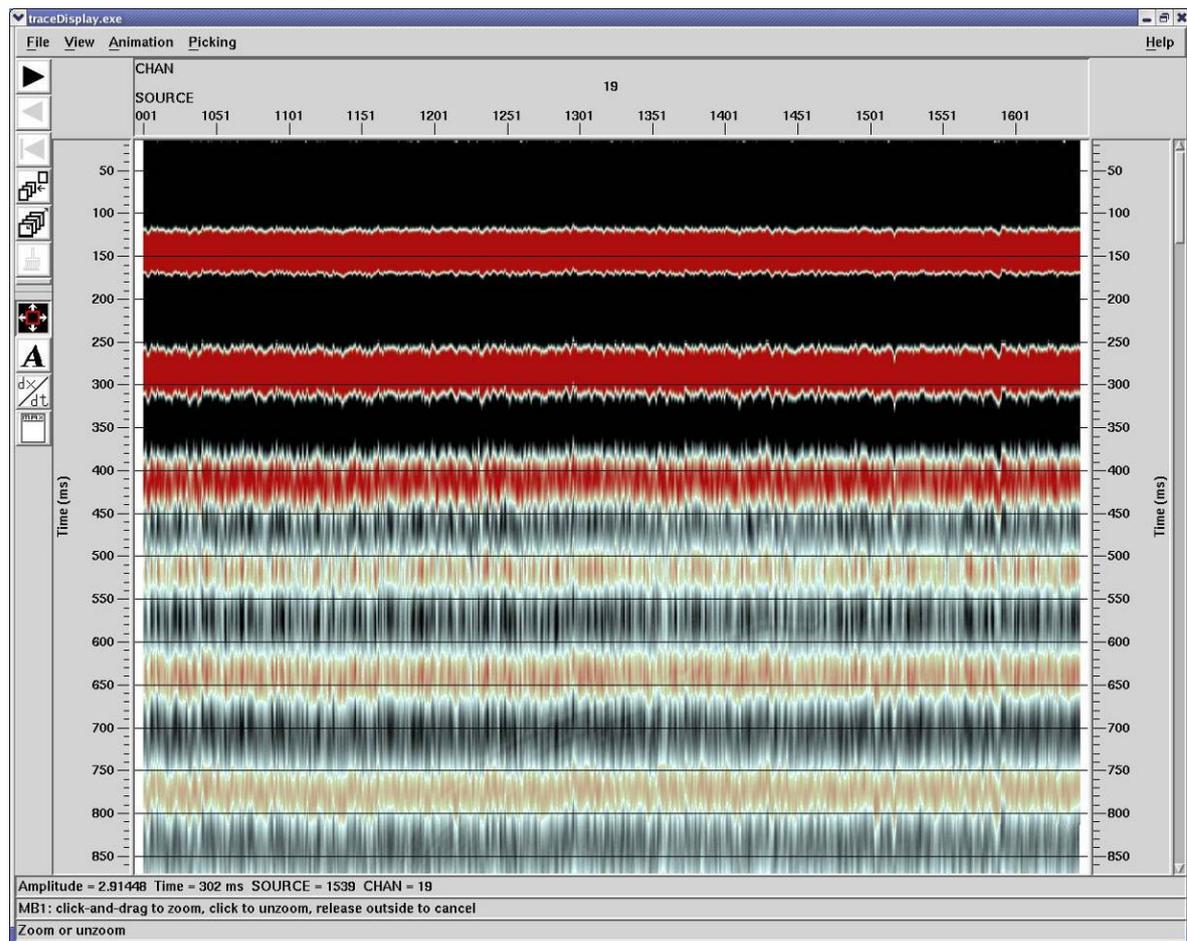


Figure 5. Near field hydrophone 19 on Array 1 (Sequence 027 Bronze Whaler).

17.12. Shot Record Displays

Shot records were filtered to the signal bandwidth and balanced with a true amplitude gain recovery. They were displayed on screen every 50 shot points, for each line. Additional records were also examined on screen if an issue with acquisition was suspected, such as noise, residual seismic energy or auto-fires. The colour RMS displays were used to pinpoint bad or potentially bad shots. They were investigated on screen.

Consistently noisy channels were also identified on the raw shot displays, and cross checked against the Observer's Logs, which were modified if necessary.

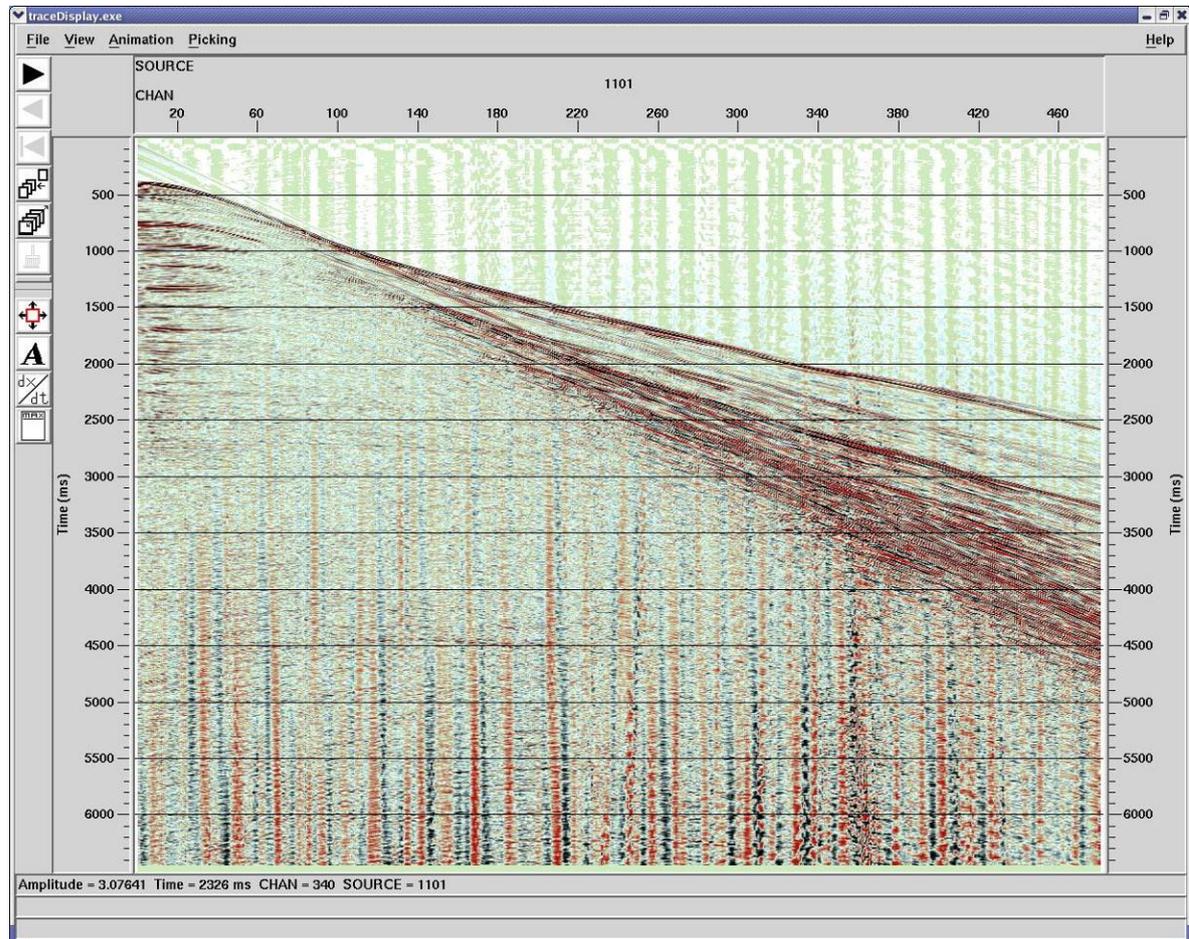


Figure 6. Raw shots display, Sequence 002 Bronze Whaler.

Swell noise is present on the shot record. Ormsby band pass filter 6-8-90-120 Hz has been applied to raw shot gather.

17.13. Navigation Processing

In order to QC navigation data, the final processed P190 was merged with the near trace for each line. The direct arrival time was then computed and overlaid on the near trace display as seen below (in red)

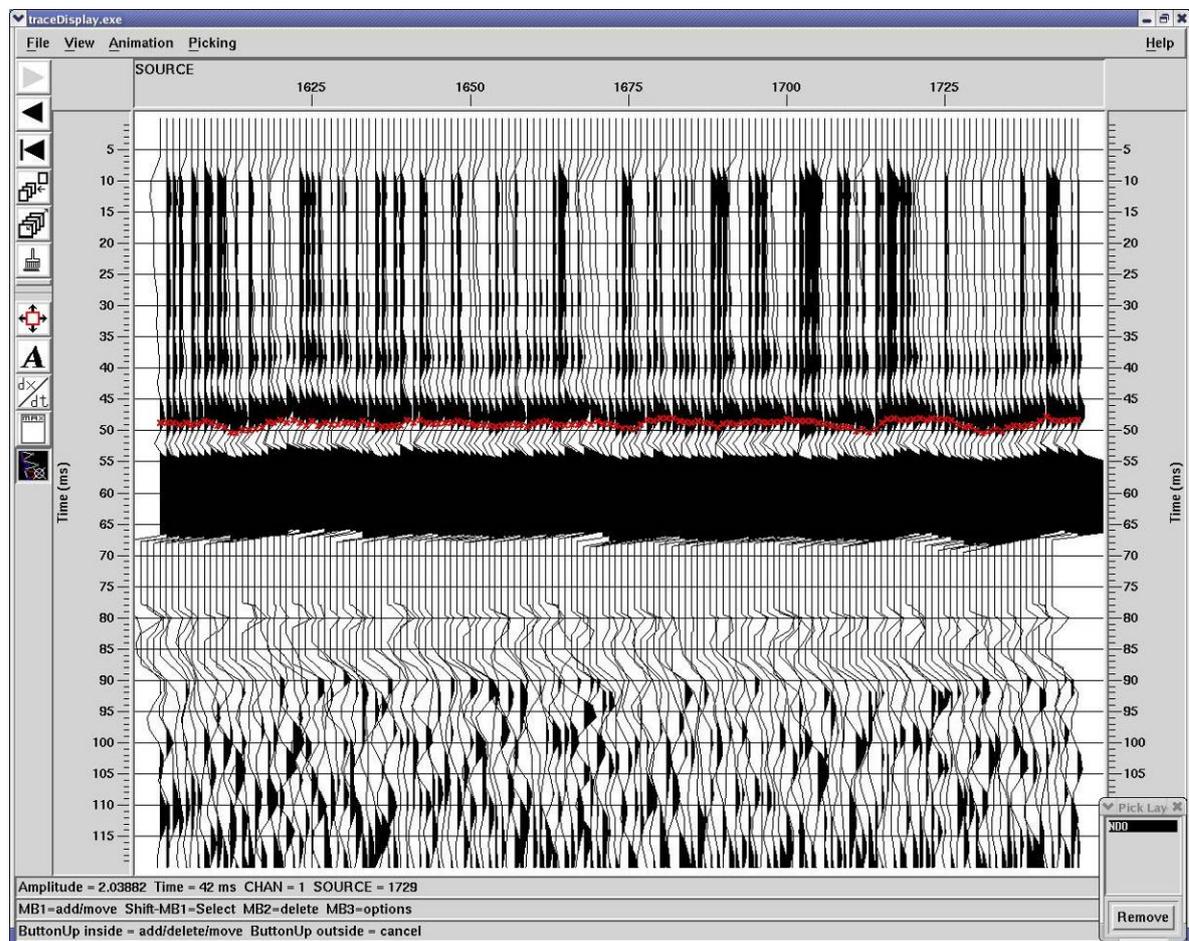


Figure7. Nav QC display of sequence 057 Deep Water Area.

18. Production processing

No production processing was performed on this project

18.1. Encountered problems

18.1.1. Current noise

Current noise did not have any significant effect on the data.

18.1.2. Swell noise

The weather conditions varied over the period of survey. In general, increased sea state was observed for most of the survey. Swell bursts that introduced noise over 25uB were apparent on most of the lines. Acquisition had to be halted on a number of occasions when swell noise exceeded the acceptable level and we had some down-time due to that. Due to swell noise the client onboard representative made the decision to lower the cable to 8 or 9 meters on some sequences as noted in the observer logs.

18.1.3. Cable strikes

Isolated cable strikes were occasionally observed on the data due to fish strikes, submerged debris and other marine life hitting the cables. These observations were documented in the Observer Logs.

18.1.4. Autofires/misfires

Overall, the guns performed well during the period of acquisition. Processing QC confirmed the guns performance. Gun delta errors above 1.0 ms were marked in Observers Logs and in QC Excel Sheet. Most of them didn't exceed 1.5 ms. There were QC procedures in place to check for autofires (see section 3.5).

18.1.5. Air leaks

During acquisition of Sequence 001 of Deep Water Area an air leak was discovered. The full shot range over which this occurred was identified by the QC department and then edited accordingly.

We detected airleaks on sequences 53, 54 of Deep Water Area. Pressure of array 2 was within specification but close analysis of the Near Field Phones proved that seq 53&54 were not acceptable. As a result both these lines were successfully reshoot.

18.1.6. Echosounder

The echosounder wasn't working properly for most of the survey. So we were asked by Nav Department to produce ASCII format files with the values of water bottom depth calculated from seismic data. Files have been successfully produced. Seismic first break time values with static shifts were used.

18.2. Conclusion

For Deep Water Area:

58 seqs total. 4 seqs are NTBP. 54 production seqs. 50 Lines completed.

For Bronze Whaler Area:

50 seqs total. 3 seqs are NTBP. 47 production seqs. 47 Lines completed.

The data recorded during this survey was of good quality.

However, it was affected from time to time by the swell noise, due to weather conditions. Production had to be halted on two occasions when swell noise much above 25 ubar affected more than 25% of traces. Average noise level was approximately 5-15 ubars on most of the lines. Sequences 002 and 016 of Bronze Whaler Area are approximately two times more affected by the swell noise than the other lines for Bronze. Anyway we've found it acceptable.

No problems with compressor and pressure.

Just a few shot edits. (Gun Missfire Errors and Missed Shots).

The brute stacks were affected by multiples due to strong reflectors, especially for Bronze Whaler.

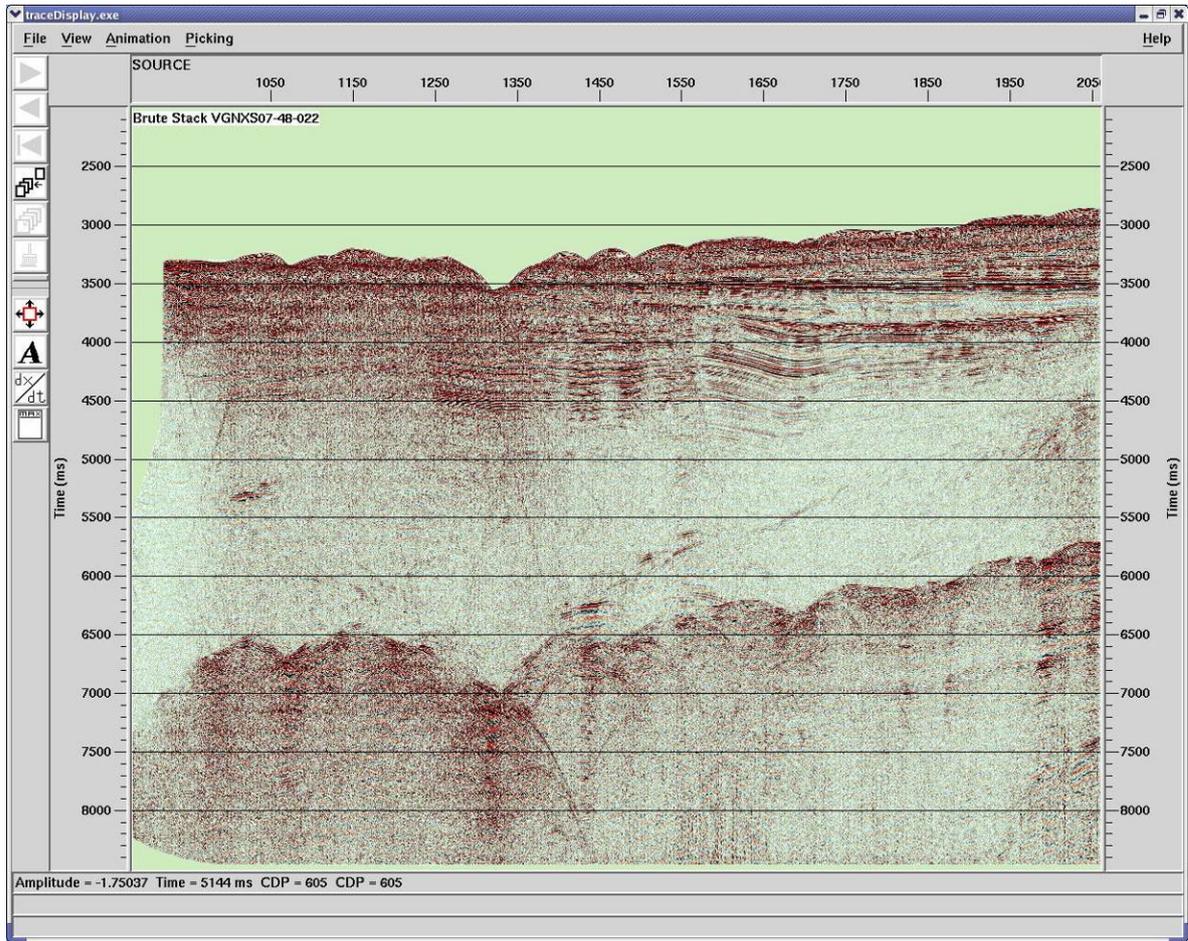


Figure 8. Brute stack of sequence 022 for Deep Water Area.

18.3. Processing Appendices

18.3.1. Promax QC log

QC processing log has been provided on the DVD.

18.3.2. SEG-Y Brute Stack Headers

SEG-Y STACKS EBCDIC HEADER TEMPLATE

ITEMS MARKED BY BOLD FONT DIFFERS FROM LINE TO LINE (AND RECORD LENGTH 6500 FOR BRONZE AND 8500 FOR DEEP WATER)

C 1 CLIENT: NEXUS ENERGY COMPANY: CGG VERITAS
C 2 SURVEY: VIC P/49 2007, DEEP WATER AREA: GIPPSLAND BASIN, AUSTRALIA
C 3 BRUTE STACK
C 4 GNXS07-**XX-0XX** SP: **XXXX-XXXX** CDP: 1-**XXXX**
C 5 DATA TRACES/STREAMER: 480 AUXILIARY TRACES/RECORD: 24
C 6 SAMPLE RATE: 2MS RECORD LENGTH: **8500ms**
C 7 RECORDING FORMAT: SEG-D 8058 REV 1 FILTERS: DIGITAL LOW CUT: OUT
C 8 ANALOG LOW CUT: 3 HZ 6 DB/OCTAVE HIGH CUT: 200 HZ 370 DB/OCTAVE
C 9 STREAMER: SERCEL SEAL SOLID ACTIVE LENGTH: 6000 M
C10 GROUP INTERVAL: 12.5 M DEPTH: 7 M
C11 SOURCE: TYPE: BOLT AIRGUN VOLUME: 3440 CU IN
C12 NO OF STRINGS/ARRAY: 1
C13 ARRAY PRESSURE: 2000 PSI ARRAY DEPTH: 6 M
C14
C15 SEG-Y HEADER BYTES
C16
C17 Line Number 189-192
C18
C19 SP ANNOTATED AT NEAR TRACE CDP
C20
C21 PROCESSING:
C22
C23 REFORMAT - SEG-D TO PROMAX FORMAT
C24 APPLY NOMINAL GEOMETRY
C25 INSTRUMENT DELAY -50ms
C26 SHOT AND CHANNEL EDITS BASED ON OBSERVER LOGS AND QC
C27 BANDPASS FILTER, ORMSBY 6-8-90-120 HZ
C28 RESAMPLE 2ms TO 4ms. HIGH FIDELITY ANTIALIAS FILTER
C29 MARINE TRACE DECIMATION, 2:1, USING SINGLE NMO FUNCTION
C30 TAR - T**2 CORRECTION
C31 NMO, VELOCITIES PICKED AT 2 KM INTERVALS
C32 GUN & CABLE STATIC 8ms
C33 CDP STACK, STRAIGHT MEAN SQUARE ROOT NORMALIZATION
C34
C35 CDP INTERVAL 12.5 METRES
C36
C37
C38 **JULY** 2007
C39 END EBCDIC

18.3.3. Noise history display

The following display shows the noise record history for all sequences, calculated from noise files. All channels for each noise record have been stacked together to a single trace. The average graph shows an average value.

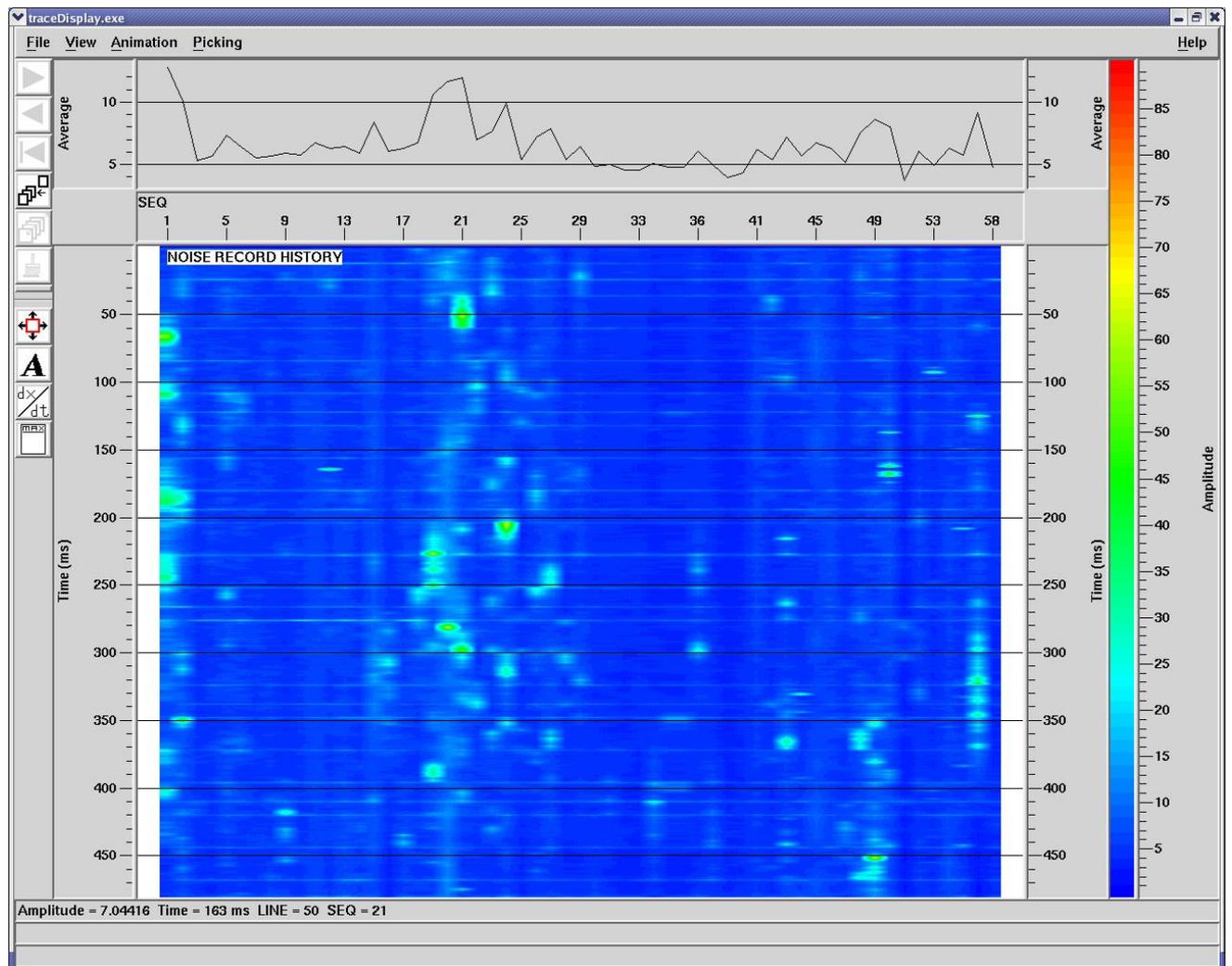


Figure 9. Noise history display for Sequences 001 - 058 (Deep Water Area).

18.3.4. RMS history display

The following display shows the line average RMS for each individual channel on streamer for Sequences 001-058, calculated from RMS window 2500-3000 ms for Deep Water Area.

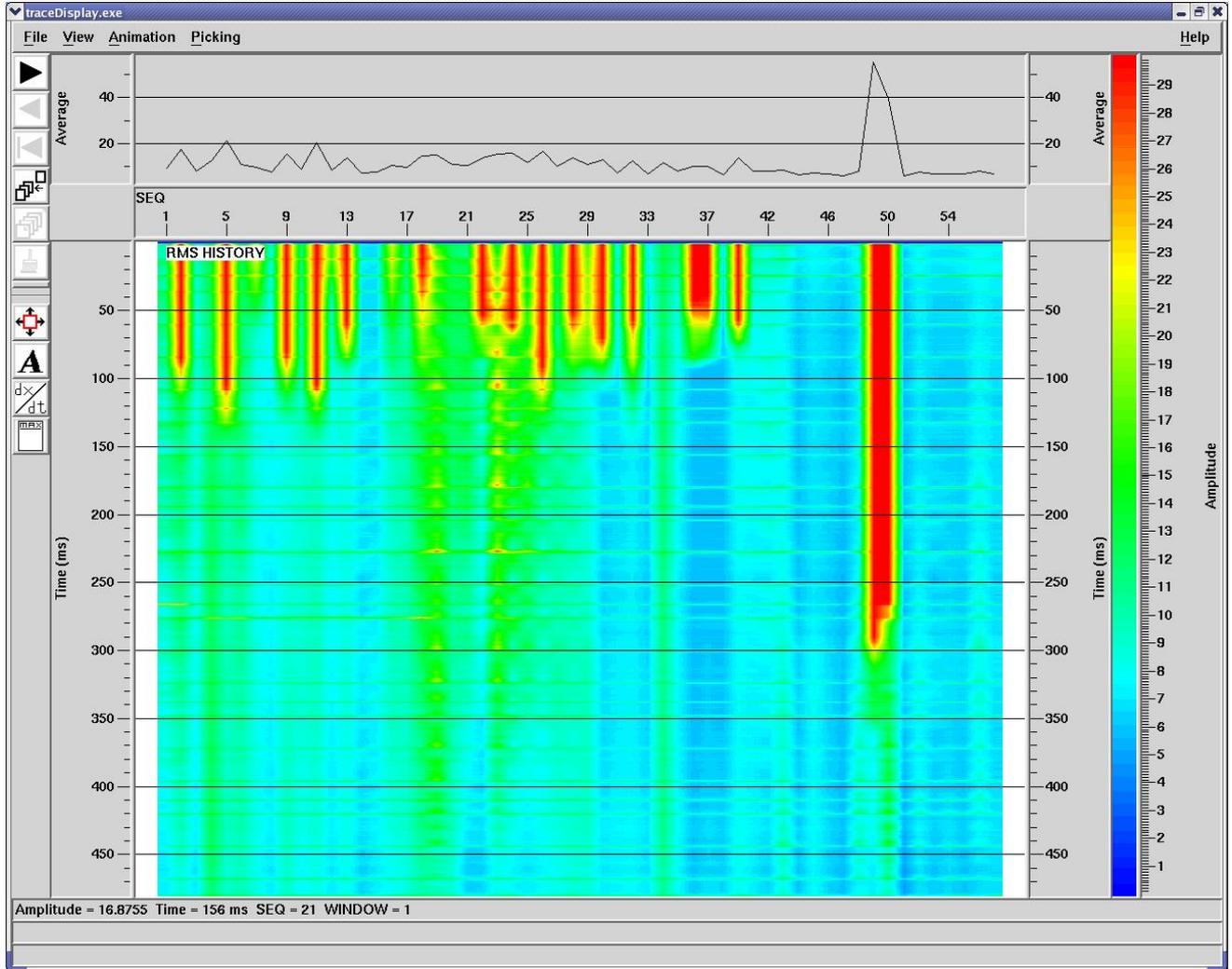


Figure 10. Shallow RMS history display for Sequences 001 - 058 (Deep Water Area).

The following display shows the line average RMS for each individual channel on streamer for Sequences 001-058, calculated from RMS window 6500-7000 ms for Deep Water Area.

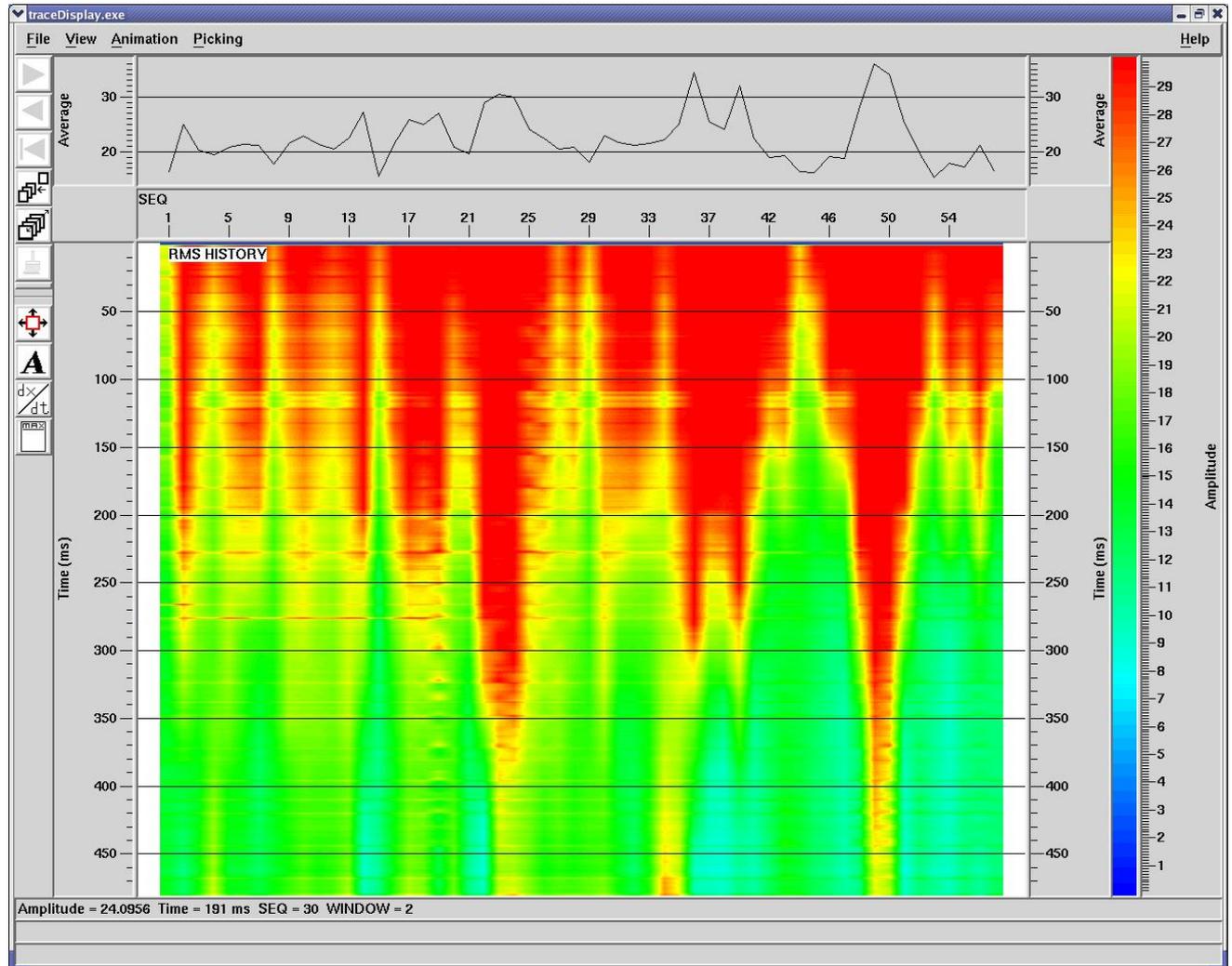


Figure 11. Middle RMS history display for Sequences 001 - 058 (Deep Water Area).

The following display shows the line average RMS for each individual channel on streamer for Sequences 001-050, calculated from RMS window 300-500 ms for Bronze Whaler Area.

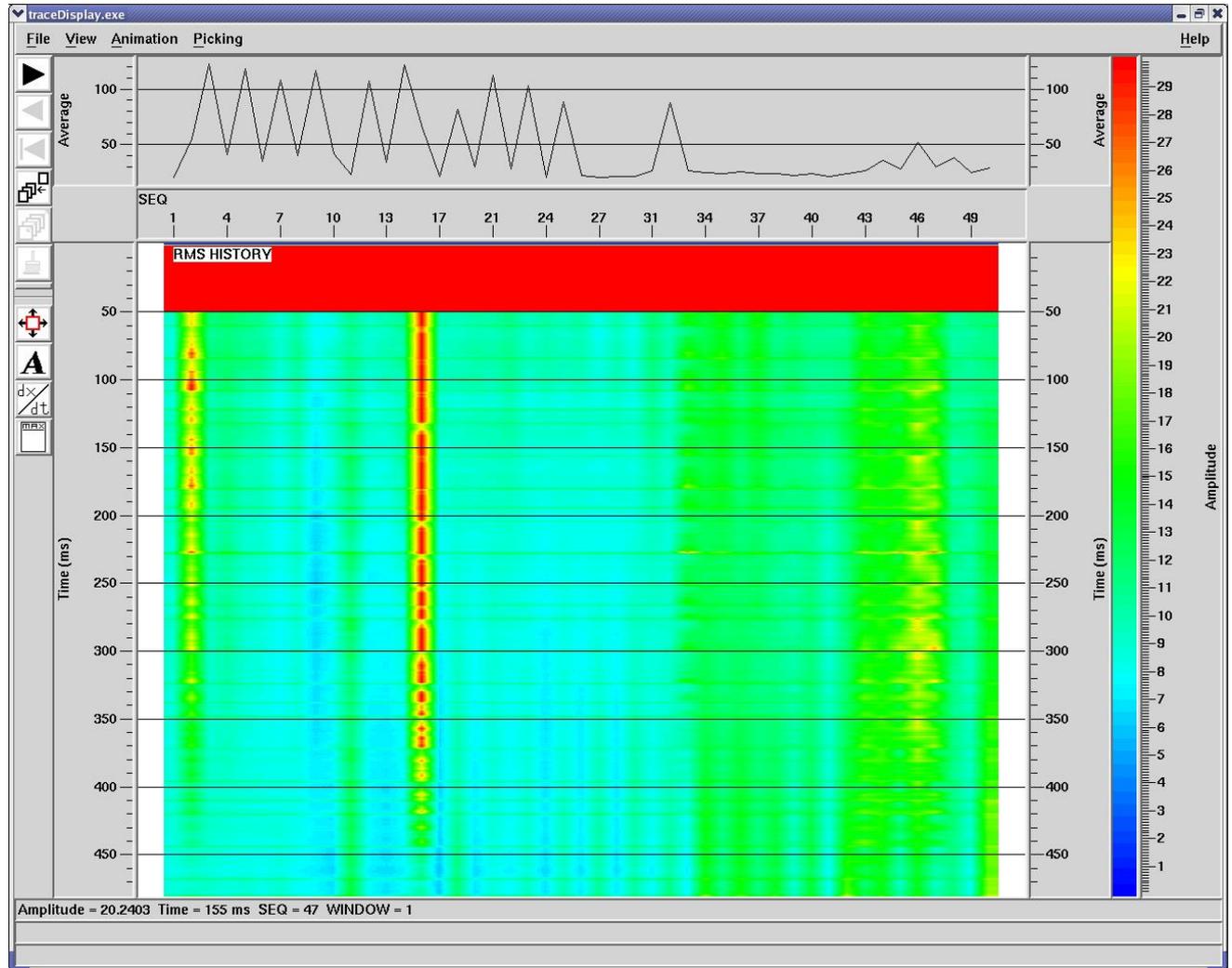


Figure 12. Shallow RMS history display for Sequences 001 - 050 (Bronze Whaler Area).

The following display shows the line average RMS for each individual channel on streamer for Sequences 001-050, calculated from RMS window 6200-6400 ms for Bronze Whaler Area.

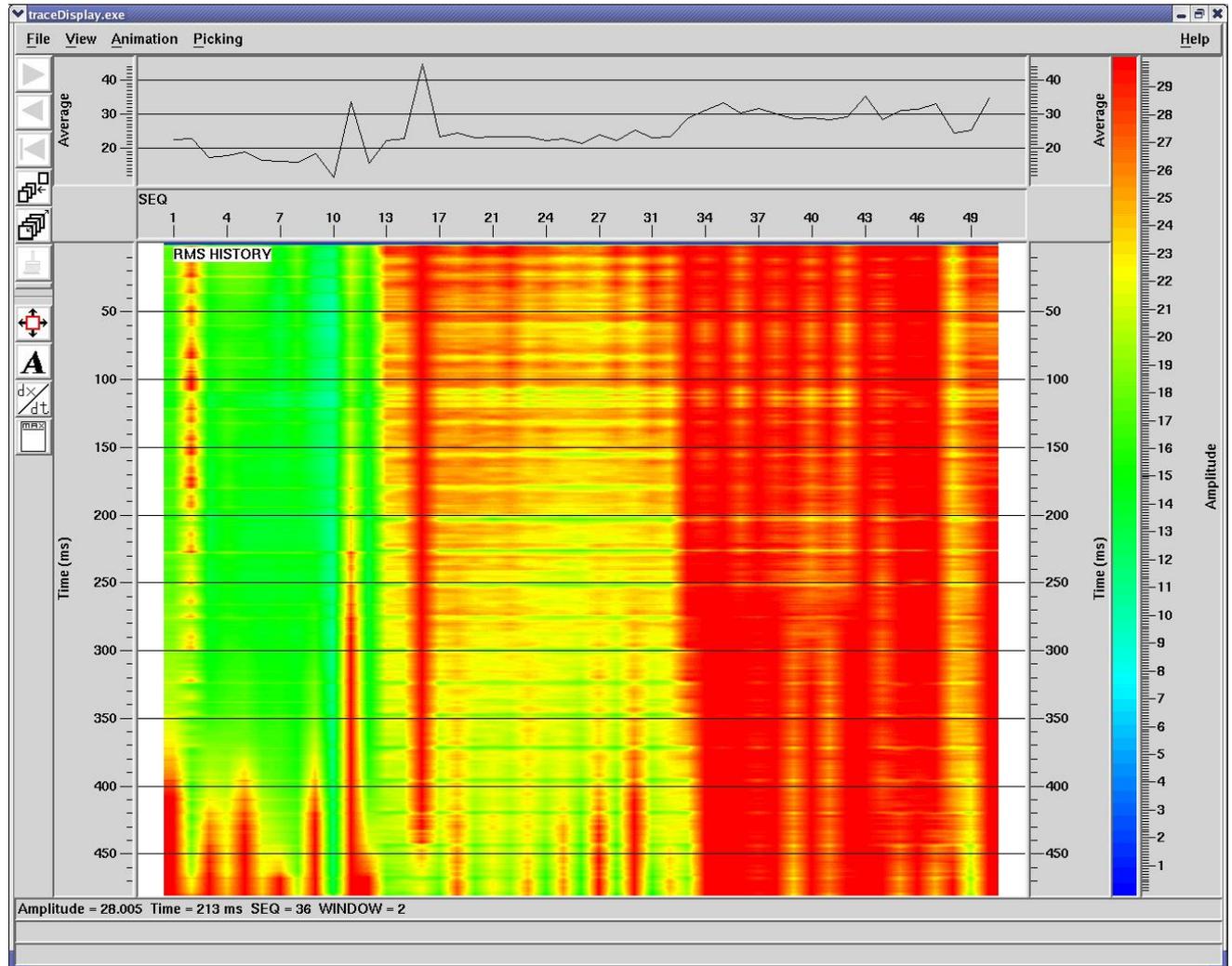


Figure 13. Deep RMS history display for Sequences 001 - 050 (Bronze Whaler Area).

18.3.5. Shipment

QC Team deliverables have been included into Primary and Copy Tapes Shipments.

The following QC products were shipped to the client at the end of the survey:

Shipment #: PT-2007-052 / with Nexus Deep Water and Bronze Primary Tapes Shipment/

Date: 18 July 2007

Contents covers All Sequences: 001 to 058 for Area Deep Water

001 to 050 for Area Bronze Whaler

- 1. 1 x DVD containing CGM Stack files, SEG-Y Stack files, various QC screen displays, velocities (ASCII format) and ambient noise (ASCII format) files.**
- 2. 1 x 3590 tape containing SEG-Y and CGM format stacks (TAR archives).**
- 3. Brute Stack and Near Trace Paper Plots.**

The above items were sent to:

CGG VERITAS ASIA PACIFIC

MAS ACADEMY - ITPS CENTRE, 3rd Floor

#2 Jalan SS7/13

47301 Kelana Jaya

Selangor, Malaysia

Attn: Baruzie

Shipment #: PT-2007-053 / with Nexus Deep Water and Bronze Copy Tapes Shipment/

Date: 18 July 2007

Contents covers All Sequences: 001 to 058 for Area Deep Water

001 to 050 for Area Bronze Whaler

- 1. 1 x DVD containing CGM Stack files, SEG-Y Stack files, various QC screen displays, velocities (ASCII format) and ambient noise (ASCII format) files.**
- 2. 1 x 3590 tape containing SEG-Y and CGM format stacks (TAR archives).**

The above items were sent to:

NEXUS ENERGY

134 Little Lonsdale Street

Melbourne

Victoria 3000

Australia

Attn: Jane Rodgers

Tel: 61 3 9660 2500

Fax: 61 3 9654 9303

Nexus Energy Ltd

