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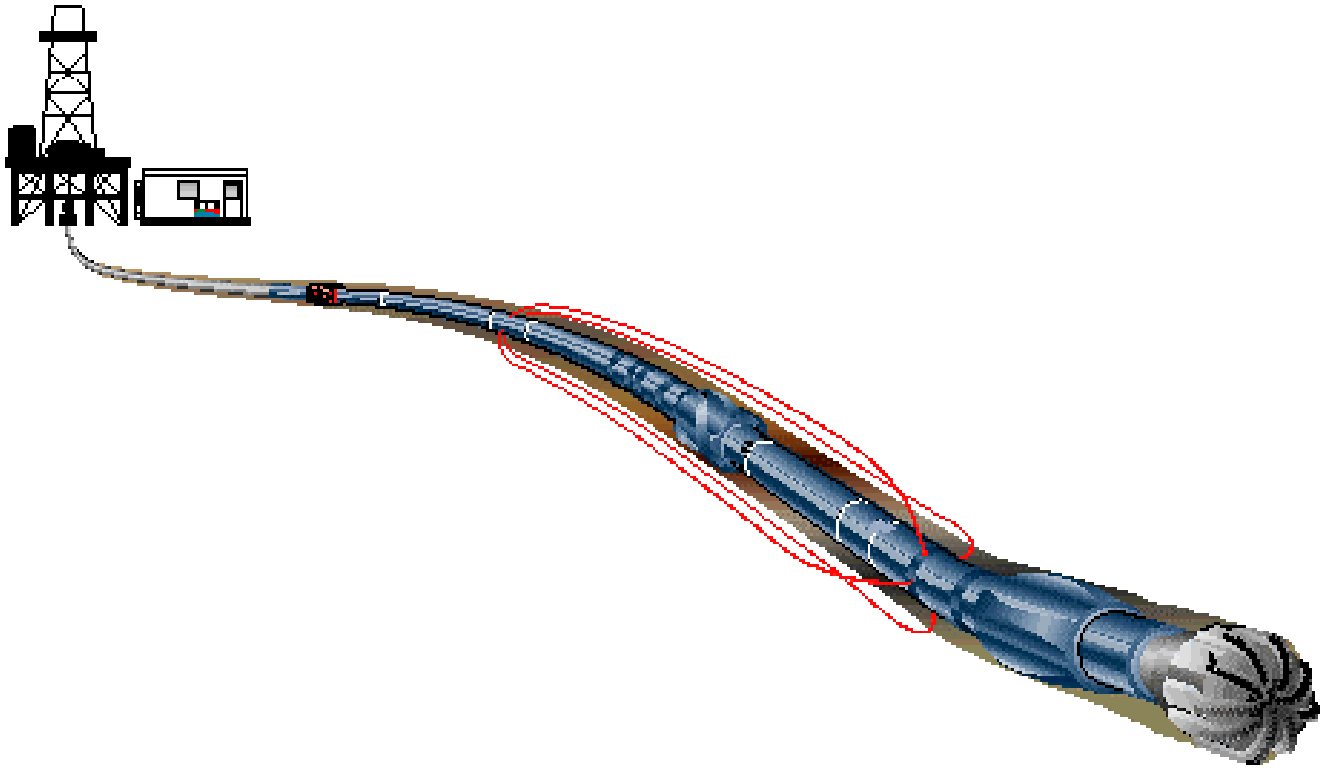
IDEAL

Santos

Casino-2

MWD / LWD End of Well Report



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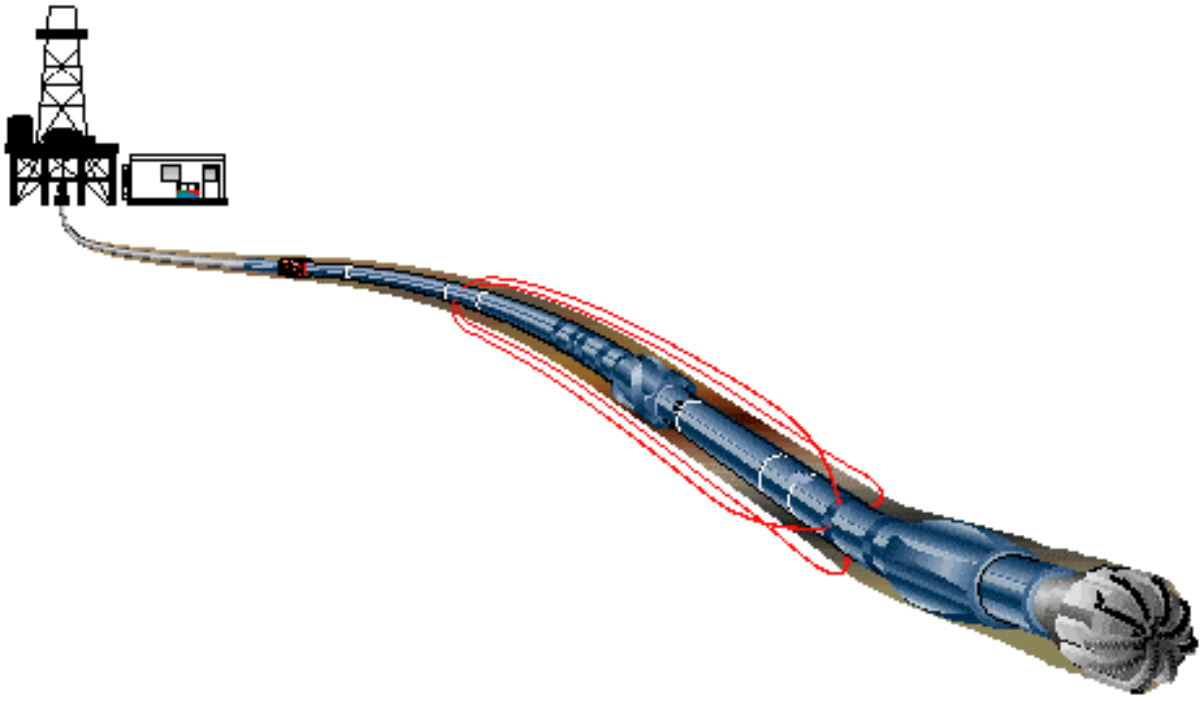
End of Well Report for Casino-2

Contents

General Information



General Information

Well Name:	Casino-2	
Rig:	DOGC Ocean Bounty	
Field:	Otway Basin	
Location:	Vic/P 44	
Country:	Australia	
Cell Members:	Antonino Abad	MWD/LWD Engineer
	Chu Mhin Tue	MWD/LWD Engineer
Town Contact:	Raymond Nanan	Location Manager
	Hrvoje Spoljaric	Service Quality Coach
	Go Ching Lian	Field Service Manager
	Alex van den Tweel	DD Coordinator
Company Representatives:	Ron King	Company Man
	Gavin Othen	Company Man
	Steve Hodgetts	Company Man
	Ram Subramaniam	Wellsite Geologist
	Melroy D'Cruz	Wellsite Geologist

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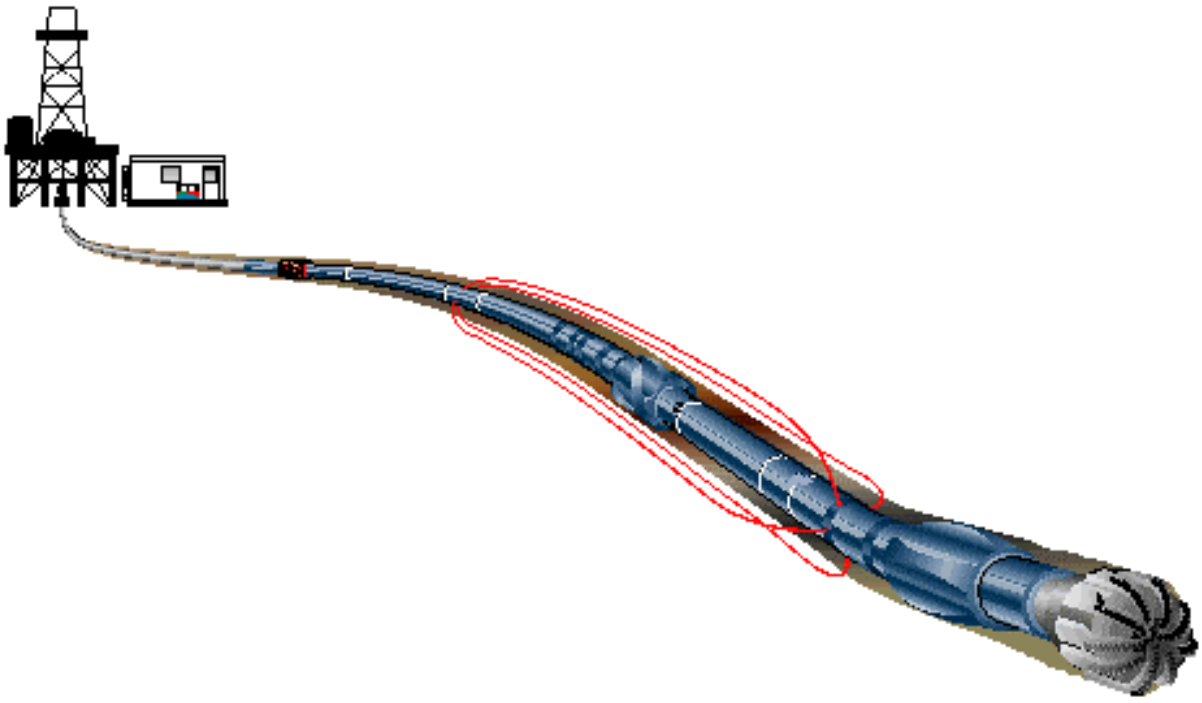
MWD / LWD Overview



Logging Overview Casino - 2

Schlumberger Drilling and Measurements provided LWD and MWD services in the 12-¼ in. section of the Casino– 1 well.
In the 12-¼ in. section, the following formation evaluation measurements were delivered in real time and memory modes:

- Phase Shift Resistivity (CDR)
- Attenuation Resistivity (CDR)
- Formation Gamma Ray (CDR)
- Phase Shift Resistivity (ARC)
- Attenuation Resistivity (ARC)
- Compressional Delta-T (ISONIC)

Furthermore survey data were transmitted in real time by the PowerPulse tool but not recorded in tool memory.

Run	Hole Size (in.)	Service	Start Depth (m)	Stop Depth (m)
1	12 ¼	PowerPulse / CDR / ISONIC	700	1646
2	12 ¼	PowerPulse / CDR / ISONIC	1646	1763
3	12 ¼	PowerPulse / CDR / ISONIC	1784	2112

12 ¼ in. Section (Runs 1 to 2, 700 to 1763 m MD):

The CDR / PowerPulse / ISONIC combination was used for formation evaluation in the drilling of Casino-2 well. CDR and ISONIC logs were also used to correlate formation evaluation logs from Casino-1 well that was drilled prior to this well. The MWD tool was programmed to transmit real time information at 6.4 bits per second and this allowed obtaining a good quality log in real time.

The ISONIC had been programmed to pick compressional Delta-T. Top interval of the ISONIC log from 700 meters to 900 meters measured depth has bad acoustic data due to high ROP and high level of shocks. Client was informed of high shocks and changed in drilling parameters were applied.

After making a connection at depth of 1696 meters in Run #2, the PowerPulse tools stopped transmitting data. Mud pumps were cycled a few times but without any success. Informed Company Man and Wellsite Geologist of the situation and a decision was made to continue drilling and keep on monitoring ROP for drilling break and gas return that would indicate coring point. Top of the Coring point was called at depth of 1763 meters.

After pulling out of hole, LWD recorded memory data were retrieved from the CDR and ISONIC tools. No problem was found in the LWD tools but PowerPulse MWD tool failed to communicate with the surface computers. Further failure analysis on root cause of failure will be conducted at the Repair and Maintenance (R&M) facility. Final result of failure analysis will be forwarded to the client as soon as possible.

12 ¼ in. Section (Run 3, 1784 m to 2112 m MD):

The back-up PowerPulse MWD tool was pick-up for run number 3 and CDR tool were laid down and replaced by the ARC tool. The CDR tool was laid out due to the fact that the back-up PowerPulse tool was originally set-up to run with the ARC tool.

Reaming operation was performed in real time and recorded mode from depth of 1745 meters to coring run TD of 1784 meters. Reaming was kept at 30 to 40 m/hr to get good LWD data quality.

ISONIC compressional Delta-T looks spiky when drilling through sandstones interbedded with siltstones. ISONIC compressional Delta-T response was correlating well with the formation being drilled.

This run resulted to Casino-2 well TD.

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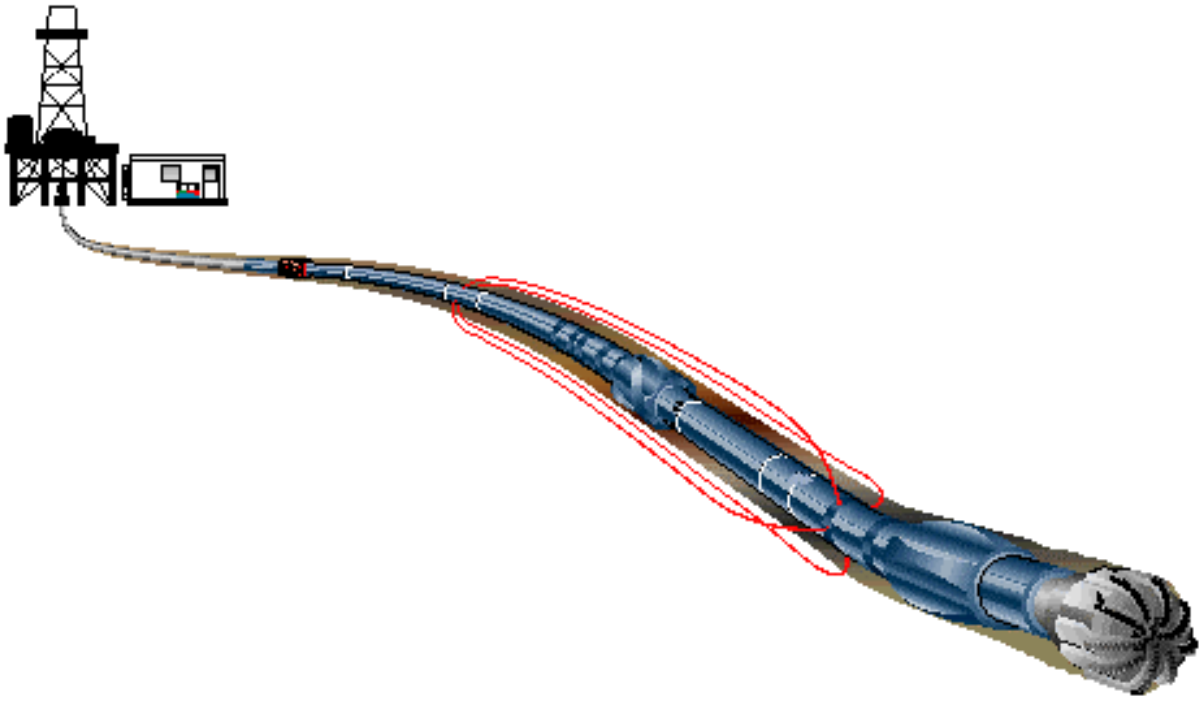
Geomagnetic and Survey Reference Criteria



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Geomagnetic and Survey Reference Criteria

Geomagnetic Data

Magnetic Model:	BGGM version 2001
Magnetic Date:	27-Sep-2002
Magnetic Field Strength:	1220.24 HCNT
Magnetic Declination:	10.89 degrees
Magnetic Dip:	-70.02 degrees

Survey Reference Criteria

Reference G:	1000.08 mgal
Reference H:	1220.24 HCNT
Reference Dip:	-70.02 degrees
G value Tolerance:	2.50 mgal
H value Tolerance:	6.00 HCNT
Dip Tolerance:	0.45 degrees

Survey Corrections Applied

Reference North:	Grid North
Magnetic Declination:	10.89 degrees
Grid Convergence:	-1.09 degrees
Total Azimuth Correction:	11.98 degrees
Vertical Section Azimuth:	0.00 degrees

Survey Reference Location

Casino-2 Final Coordinates

Datum:	GDA94	
Latitude:	38 ° 47 ’ 43.887”	South
Longitude:	142 ° 44 ’ 50.746”	East
Projections:	MGA Zone 54, CM 141 ° East	
Easting:	651 752.63	meters
Northing:	5 704 463.79	meters

Note:

Data as per Thales Geosolution (Australia) Ltd. fax to Santos via Ole Moller, reference number F26927/3447A3 dated 26th September 2002.

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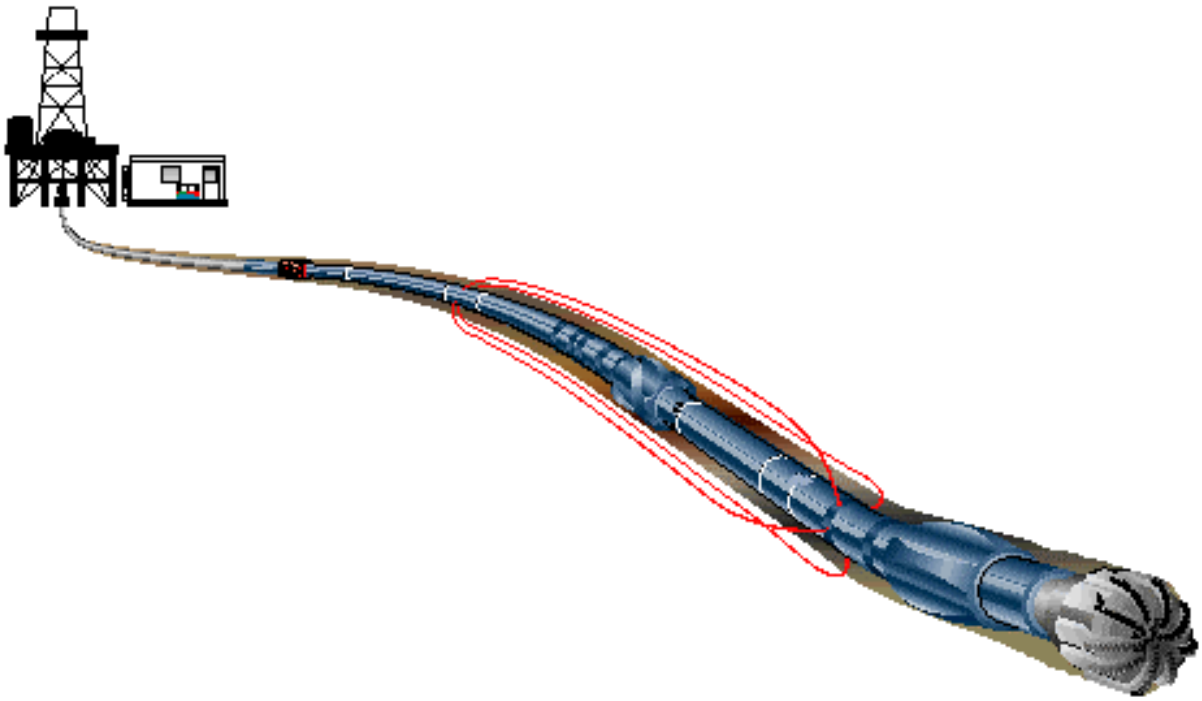
Survey Report



SCHLUMBERGER - D&M

Survey report

Client.....: Santos
Field.....: Exploration

Well.....: Casino-2
API number.....:
Engineer.....: A. Abad, C. Tue

RIG:.....: Ocean Bounty
STATE:.....: Victoria

Spud date.....: 24 Sep 02
Last survey date.....: 04-Oct-02
Total accepted surveys...: 25
MD of first survey.....: 0.00 m
MD of last survey.....: 2112.00 m

----- Survey calculation methods----------
Method for positions.....: Minimum curvature
Method for DLS.....: Mason & Taylor

----- Depth reference ----------
Permanent datum.....: GROUND LEVEL
Depth reference.....:
GL above permanent.....: -68.00 m
KB above permanent.....: 0.00 m
DF above permanent.....: 25.00 m

----- Vertical section origin----------
Latitude (+N/S-).....: 0.00 m
Departure (+E/W-).....: 0.00 m

----- Platform reference point----------
Latitude (+N/S-).....: 0.00 m
Departure (+E/W-).....: 0.00 m

Azimuth from rotary table to target: 0.00 degrees

----- Geomagnetic data ----------
Magnetic model.....: BGGM version 2001
Magnetic date.....: 27-Sep-2002
Magnetic field strength..: 1220.24 HCNT
Magnetic dec (+E/W-).....: 10.89 degrees
Magnetic dip.....: -70.02 degrees

----- MWD survey Reference Criteria ---------
Reference G.....: 1000.08 mGal
Reference H.....: 1220.24 HCNT
Reference Dip.....: -70.02 degrees
Tolerance of G.....: (+/-) 2.50 mGal
Tolerance of H.....: (+/-) 6.00 HCNT
Tolerance of Dip.....: (+/-) 0.45 degrees

----- Corrections ----------
Magnetic dec (+E/W-).....: 10.89 degrees
Grid convergence (+E/W-).: -1.09 degrees
Total az corr (+E/W-)....: 11.98 degrees
(Total az corr = magnetic dec - grid conv)
Sag applied (Y/N).....: No degree: 0.0

Seq # -	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 10m)	Srvy tool type	Tool qual type
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIP	-
2	729.86	0.57	116.39	729.86	729.85	-1.61	-1.61	3.25	3.63	116.39	0.01	MWD	6-axis
3	842.72	0.61	203.59	112.86	842.70	-2.41	-2.41	3.51	4.26	124.48	0.07	MWD	6-axis
4	958.13	0.69	268.77	115.41	958.11	-2.99	-2.99	2.57	3.95	139.29	0.06	MWD	6-axis
5	1074.07	0.52	252.87	115.94	1074.04	-3.16	-3.16	1.37	3.45	156.52	0.02	MWD	6-axis
6	1130.64	0.79	283.25	56.57	1130.61	-3.15	-3.15	0.75	3.24	166.63	0.08	MWD	6-axis
7	1161.14	0.82	278.20	30.50	1161.10	-3.07	-3.07	0.33	3.09	173.91	0.03	MWD	6-axis
8	1188.85	0.76	272.62	27.71	1188.81	-3.03	-3.03	-0.05	3.03	180.99	0.04	MWD	6-axis
9	1217.68	0.78	286.97	28.83	1217.64	-2.97	-2.97	-0.43	3.00	188.27	0.07	MWD	6-axis
10	1247.53	0.88	282.51	29.85	1247.49	-2.86	-2.86	-0.85	2.98	196.55	0.04	MWD	6-axis
11	1277.80	0.94	274.80	30.27	1277.75	-2.79	-2.79	-1.32	3.08	205.41	0.05	MWD	6-axis
12	1364.44	1.05	276.88	86.64	1364.38	-2.63	-2.63	-2.82	3.86	226.98	0.01	MWD	6-axis
13	1421.10	1.45	272.46	56.66	1421.03	-2.54	-2.54	-4.05	4.78	237.93	0.07	MWD	6-axis
14	1450.24	1.55	270.01	29.14	1450.16	-2.52	-2.52	-4.81	5.43	242.35	0.04	MWD	6-axis
15	1508.96	1.49	255.36	58.72	1508.86	-2.72	-2.72	-6.35	6.90	246.84	0.07	MWD	6-axis
16	1565.71	1.58	268.16	56.75	1565.59	-2.93	-2.93	-7.84	8.37	249.53	0.06	MWD	6-axis
17	1622.24	1.67	265.96	56.53	1622.09	-3.01	-3.01	-9.44	9.91	252.32	0.02	MWD	6-axis
18	1652.08	1.45	267.41	29.84	1651.92	-3.06	-3.06	-10.25	10.70	253.40	0.07	MWD	6-axis
19	1796.08	1.43	253.78	144.00	1795.88	-3.64	-3.64	-13.80	14.27	255.22	0.02	MWD	6-axis
20	1853.43	1.50	250.23	57.35	1853.21	-4.10	-4.10	-15.19	15.74	254.91	0.02	MWD	6-axis
21	1911.17	1.48	243.72	57.74	1910.93	-4.68	-4.68	-16.57	17.22	254.23	0.03	MWD	6-axis
22	1998.68	1.91	243.21	87.51	1998.40	-5.84	-5.84	-18.89	19.77	252.82	0.05	MWD	6-axis
23	2028.08	2.08	243.11	29.40	2027.78	-6.30	-6.30	-19.80	20.78	252.35	0.06	MWD	6-axis
24	2085.35	2.47	242.08	57.27	2085.01	-7.35	-7.35	-21.82	23.02	251.39	0.07	MWD	6-axis
25	2112.00	2.47	242.08	26.65	2111.63	-7.89	-7.89	-22.83	24.16	250.94	0.00	TD Pojection	

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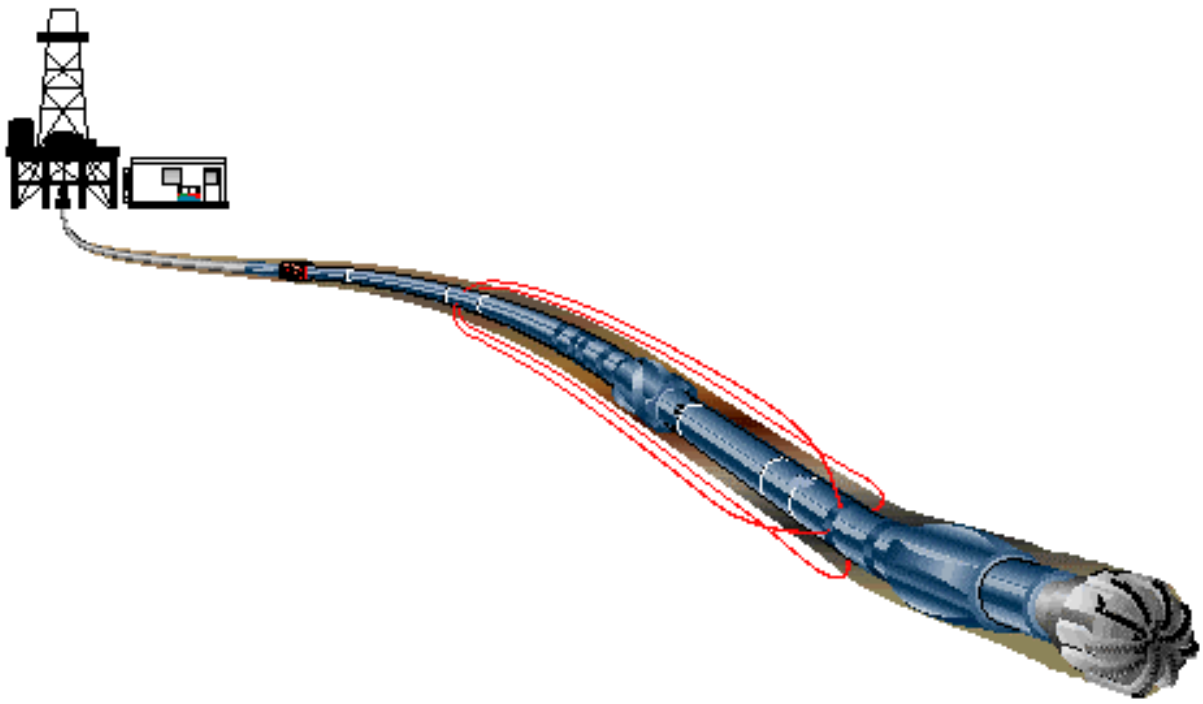
MWD – LWD Bit Run Summary



Schlumberger — DRILLING & MEASUREMENTS - RUN SUMMARY

RUN INFORMATION

Job Number	Company Rep.	Date In	Date Out	D&M Run Number	Rig Run Number
AWA-02-17	SANTOS	28-Sep-02	30-Sep-02	1	3

Company: Schlumberger	Grid Corr	Brief Run Summary: Good Run		Bit Run Number: 3	Cell Manager: Antonino Abad
Rig Name: Ocean Bounty					
Well Name: Casino-2	Tot Corr	Hole Depth: From 700 m	To 1646 m	D&M Crew: C. Tue	
Location: Bass Strait					
Mapfile	Mag Dec	PP Slot ID	Inclination (Drift): From 0.57 deg	To 1.67 deg	Pumping Hours: 49.6 hrs.	Below Rotary Tbl Hrs: 93 hrs.

BPS	Frequency	Mod Type	Azimuth		Rotary Hours	Rotary Distance
6.4	16	QPSK	From deg	To deg	38.55 hrs.	946 m

Pump Type	Pump Output	Pump Strk Len.	True Vertical Depth		Slide Hours	Slide Distance
12-P-160	603	12	From 700 m	To 1646 m	0 hrs.	0 m

Pump Liner ID	Min DLS	Max DLS	Hole Size	Water Depth	Air Gap	Drilling Hours	Drilling Distance
6			12.25 in	68 m	25 m	38.55 hrs.	946 m

Bent Sub Angle	Bent HSG Ang	Depth Max DLS	RKB Height	Ground Elev.	Mod Gap	Reaming Hours	Reaming Distance
deg	deg	m	m	m	0.12 in	0 hrs.	0 m

Pulse Ht Thresh	Min Pulse Wdt	Max Pulse Wdt	Digit Time	T/F Arc	T/F Angle	On Bottom Hours	Service
				in	deg	38.55 hrs.	PP/CDR/ISONIC/IWW

Conn Phase Ang	Rise Const	Fall Const	H2S In Well	Damp Press	Signal Streng.	Last Casing	
deg			☐	1000 psi	38	Size 13.375 in	Depth 690.5 m

Directional Driller(s)	Turbine RPM @ Min Flow Rate		Turbine RPM @ Max Flow Rate	
	RPM 2812	FR 870 gpm	RPM 2265	FR 690 gpm

Run Objective:

EQUIPMENT DATA

Equipment Code	Pump Hrs Start	Pump Hrs Cum	SW Vers	Tool Size	Equipment Code	Pump Hrs Start	Pump Hrs Cum	SW Vers	Tool Size	Sensors Code	Real Time Hrs	Real Time Fail	Real Time Drilled	Recorded Time Hrs	Recorded Time Fail	Recorded Time Drilled
MDC-DC-231	0	49.6	6.1 C00	8.00						MDC-DC-231	49.6	☐	946		☐	
RGS9-AA-9556	0	49.6	5.0B 05	9.50						RGS9-AA-9556	49.6	☐	946	49.6	☐	946
SWD8-BA-829	0	49.6	5.0B 10	8.00						SWD8-BA-829	49.6	☐	946	49.6	☐	946
SZR-PA-360716	0	49.6										☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	

Surface Sys	IDEAL/SPM
Version	ID7_0C_02

DH MOTOR

Manufacturer		Stage Length	m	Bit to Bend Dist.	m	Bearing Gap In	
Type		Rubber		RSS Mfr		Bearing Gap Out	
Size		Sleeve Position		RSS Type		Radial Bearing Play	
Serial Number		Sleeve Size	in	RSS Size		Thrust Bearing Play	
Lobe Config.		Motor Fail	☐	RSS SN			

OPERATING COND.

Max Circ Temp	57.00 C	Avg ROP	24.00 m/hr	Min Actl FlowRt	690.00 gpm	Max Shock Dur	1.66 sec.
Min Circ Temp	35.00 C	Max ROP	200.00 m/hr	Avg PmpPres	3258.00 psi	Total DH Shocks (k)	9.41 k
End Mud Wt	10.00 lb/gal	Avg Surf RPM	121.00	PmpPres On Bot	3800.00 psi	CHECK SHOT	
End Funnel Vis	60.00 CPS	Min RPM	110.00	PmpPres Off Bot	3200.00 psi	Type	
End Plastic Vis	23.00 CPS	Max RPM	131.00	Avg Surf WOB	44.00 lbs	Depth	m
End Yield Point	29.00 CPS	Avg FlowRate	787.00 gpm	Avg Surf Torq	6333.00 ft-lbs	Inclination	deg
End Mud Resist	0.188	Max Actl FlowRt	870.00 gpm	Max Shock Lev	3	Azimuth	deg

MUD

Company	IDFS	PH	9.00	Percent Sand	0.50 %	Additives	
Brand		Chlorides	22000	Percent Solids	8.90 %	Clean	☐
Type	KCl	Other		Percent Oil	0.00 %		
LCM Type				LCM Size		LCM Concentation	

BHA

BHA Type	Other	Tur Rotor Prt #		Turbine Config		Surface Screen	☐
Int TF Offset		Stator Prt #		Pulser Config		DFS Used	☐
Low Oil Flag	☐	Hrs @ Low Oil	hrs.	Stab Spacing	in	Formation	
DD Objectives Achieved	☐	If not, why?					

BIT

Bit Type	Tri-con	Other					
Manufacturer	Model	IADC Code	No. of Jets	Size of Jets	Bit TFA	Total Revs	Stick/Slip
HTC	MX03DX	589DC	3	16	0.589		
Inner Row	Outer Row	Dull Char	Location	Brng/Seals	Gauge (1/16")	Other Char	Reason Pulled
8	8	LT	A	E	1/8	ER	15

FAILURE

Trans Fail	☐	Jamming	☐	Client Inconv.	☐	Surface Noise	☐
Pres Incr @ Fail	☐	Jamming Time	hrs.	Lost Time	hrs.	Down Hole Noise	☐
Trip Due to D&M	☐	Sync Hours	hrs.	Surface Vib	☐	Surface Sys Failure	☐

SUMMARY

Good run. Excellent RT signal from PowerPulse. Some very high ROP in the range of 100-200 m/hr during the the drilling of top section that caused bad zone on the ISONIC log. Shock were encountered during and after drilling of the cement and plug but slowly disappeared once the BHA entered the new hole.

DRILLING & MEASUREMENTS - BHA DATA

Job Number	AWA-02-17
Run Number	1
BHA Number	

Item	Description	Vendor	Material	Serial Number	Fishing Neck OD	Fishing Neck Length	Stab OD	OD	ID	Bot Connection Size	Bot Connection Type	Top Connection Size	Top Connection Type	Len	Cum Len
UNITS					in	m	in	in	in	in		in		m	m
1	Bit	HTC		589DC				12.25				6 5/8	Reg Pin	0.33	0.33
2	Near bit roller reamer			GU2151				12.25	3	6 5/8	Reg Box	6 5/8	Reg Box	2.44	2.77
3	CDR	Schlumberger		9556	10.125	4.68		9.4375	5.875	6 5/8	Reg Pin	7 5/8	H90 Box	7.54	10.31
4	MWD	Schlumberger		231				8.375	5.875	7 5/8	H90 Pin	6 5/8	FH Box	8.38	18.69
5	Inline Stab	Schlumberger			12.25	1.082	12.25	8.5	4.25	6 5/8	FH Pin	6 5/8	FH Pin	1.783	20.473
6	Isonic	Schlumberger		829	9	1.785		8.375	4.25	6 5/8	FH Box	6 5/8	Reg Box	7.282	27.755
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															

TIME/DEPTH DETAILS	1	2	3	4	5
Date/Time	9/28/2002	29-Sep	30-Sep		
Field Engineer	A. Abad	A. Abad	Chu		
Depth	1173	1594	1617		
Average ROP	60	7	5		
Avg. Std. Pres.	2786	3992	2997		
Desurger 1			2000		
Desurger 2			2000		
Tur. RPM @ FR	2578	2812	2265		
FR @ Tur. RPM	800	870	690		
Avg. RPM	128	126	110		
Max RPM	131	131	121		
Total Shocks			208.729		
Max Shock	70	10	1		
Avg. Surf. WOB	30	50	51		
Max Surf. WOB	50	54	55		
Avg. DH WOB					
Max DH WOB					
Avg. Surf. Torq.	8000	8000	3700		
Max Surf. Torq.	9000	9000	3880		
Avg. DH Torq.					
Max DH Torq.					
Formation Type			Lime stone		
Friction					
Drag Up					
Drag Down					
Mud Weight	8.5	10	10.1		
Funnel Vis.					
Plastic Vis.					
Circ. Temp	38	50	57		
Signal Strength	29	38	21		
Bit Deviation	38	38	1.6		
Differential Pres.					

PREDICTED BHA TENDENCY

Hookload	lbs	**Wt. Below Jars**	76 lbs
Pickup Wt.	lbs	**Wt. Above Jars**	lbs
Slack Wt.	lbs	**Total Air Wt.**	lbs

Stabilizer Description	Mid Pt To Bit	BLADE Type	BLADE Length	BLADE Width	GAUGE Length	GAUGE In	GAUGE Out
UNITS	m		in	in	in	in	in

Bit To Read Out Port		Bit To Measurement Port	
PPL	12.04 m	D&I PPL	14.43 m
CDR	6.21 m	GR PPL	13.82 m
ISONIC	25.25 m	GR LWD	8.53 m
	m	RES LWD	5.05 m
	m	SON LWD	25.65 m
	m		m
	m		m

BATTERY	Unloaded (V)		Loaded (V)		Run Hrs		Cum Hrs	
Tool	Before	After	Before	After	BOT	AMP	BOT	AMP

Job Number:	AWA-02-17
Run Number:	1

Date	Time	Depth	Operating Details
27-Sep-02	19:45		CDR inits
	21:20		Isonic inits
	22:30		Make up BHA
	23:55	28.00	Good SHT were performed at 700 GPM; SPT1 = 52.8 psi
28-Sep-02	4:23	599.00	Hooked geograph during topdrive services.
	4:41	630.70	Start pumping on top of cement, tools status are good.
	5:15	663.00	Drill float.
	7:51	703.70	Ideal reboot, trouble with SPM buffer.
	10:21	770.00	Getting high shock due to sandy formation.
	11:50	772.00	Decide to pull back to shoe to clean the hole.
	13:03	772.00	Back to drilling.
30-Sep-02	10:00	1646.00	POOH to change bit.
			Rm=0.1888 @ 24.5 deg C
	21:00		Tools ABT
	21:10		Dumped Isonic
	23:30		Dumped CDR.

Schlumberger — DRILLING & MEASUREMENTS - RUN SUMMARY

RUN INFORMATION

Job Number	Company Rep.	Date In	Date Out	D&M Run Number	Rig Run Number
AWA-02-17	SANTOS	30-Sep-02	1-Oct-02	2	4

Company	Schlumberger	Grid Corr	Brief Run Summary	Bit Run Number	Cell Manager
Rig Name	Ocean Bounty		Trans Failure	4	Antonino Abad
Well Name	Casino-2	Tot Corr	Hole Depth	D&M Crew	
Location	Bass Strait		From 1646 m To 1763 m	C. Tue	

Mapfile	Mag Dec	PP Slot ID	Inclination (Drift)	Pumping Hours	Below Rotary Tbl Hrs
			From 1.67 deg To 1.45 deg	9.1 hrs.	11 hrs.

BPS	Frequency	Mod Type	Azimuth	Rotary Hours	Rotary Distance
6.4	16	QPSK	From deg To deg	6.4 hrs.	117 m

Pump Type	Pump Output	Pump Strk Len.	True Vertical Depth	Slide Hours	Slide Distance
12-P-160	603	12	From 1646 m To 1763 m	0 hrs.	0 m

Pump Liner ID	Min DLS	Max DLS	Hole Size	Water Depth	Air Gap	Drilling Hours	Drilling Distance
6			12.25 in	68 m	25 m	6.4 hrs.	117 m

Bent Sub Angle	Bent HSG Ang	Depth Max DLS	RKB Height	Ground Elev.	Mod Gap	Reaming Hours	Reaming Distance
deg	deg	m	25 m	-68 m	.120 in	0 hrs.	0 m

Pulse Ht Thresh	Min Pulse Wdt	Max Pulse Wdt	Digit Time	T/F Arc	T/F Angle	On Bottom Hours	Service
				in	deg	6.4 hrs.	PP/CDR/ISONIC/IWW

Conn Phase Ang	Rise Const	Fall Const	H2S In Well	Damp Press	Signal Streng.	Last Casing	
deg			☐	1000 psi	35	Size 13.375 in	Depth 690.5 m

Directional Driller(s)	Turbine RPM @ Min Flow Rate		Turbine RPM @ Max Flow Rate	
	RPM 2382	FR 780 gpm	RPM 2734	FR 830 gpm

Run Objective

EQUIPMENT DATA

Equipment Code	Pump Hrs Start	Pump Hrs Cum	SW Vers	Tool Size	Equipment Code	Pump Hrs Start	Pump Hrs Cum	SW Vers	Tool Size	Sensors Code	Real Time Hrs	Real Time Fail	Real Time Drilled	Recorded Time Hrs	Recorded Time Fail	Recorded Time Drilled
MDC-DC-231	49.6	58.7	6.1 C00	8.00						MDC-DC-231	5	☑	60		☐	
RGS9-AA-9556	49.6	58.7	5.0B 05	9.50						RGS9-AA-9556	5	☑	60	14	☐	117
SWD8-BA-829	49.6	58.7	5.0B 10	8.00						SWD8-BA-829	5	☑	60	14	☐	117
SZR-PA-360716	49.6	58.7										☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	

Surface Sys	IDEAL/SPM
Version	ID7_0C_02

DH MOTOR

Manufacturer		Stage Length	m	Bit to Bend Dist.	m	Bearing Gap In	
Type		Rubber		RSS Mfr		Bearing Gap Out	
Size		Sleeve Position		RSS Type		Radial Bearing Play	
Serial Number		Sleeve Size	in	RSS Size		Thrust Bearing Play	
Lobe Config.		Motor Fail	☐	RSS SN			

OPERATING COND.

Max Circ Temp	60.00 F	Avg ROP	18.28 m/hr	Min Actl FlowRt	800.00 gpm	Max Shock Dur	0.00 sec.
Min Circ Temp	40.00 F	Max ROP	30.00 m/hr	Avg PmpPres	3995.00 psi	Total DH Shocks (k)	0.00 k
End Mud Wt	10.10 lb/gal	Avg Surf RPM	120.00	PmpPres On Bot	psi	CHECK SHOT	
End Funnel Vis	57.00 CPS	Min RPM	110.00	PmpPres Off Bot	psi	Type	
End Plastic Vis	20.00 CPS	Max RPM	130.00	Avg Surf WOB	40.00 lbs	Depth	m
End Yield Point	38.00 CPS	Avg FlowRate	800.00 gpm	Avg Surf Torq	8.00 ft-lbs	Inclination	deg
End Mud Resist	0.132	Max Actl FlowRt	830.00 gpm	Max Shock Lev	0	Azimuth	deg

MUD

Company	IDFS	PH	9.00	Percent Sand	0.10 %	Additives	
Brand		Chlorides	23000	Percent Solids	10.40 %	Clean	☐
Type	KCl	Other		Percent Oil	%		
LCM Type				LCM Size		LCM Concentation	

BHA

BHA Type	Rotary	Tur Rotor Prt #		Turbine Config		Surface Screen	☐
Int TF Offset		Stator Prt #		Pulser Config		DFS Used	☐
Low Oil Flag	☐	Hrs @ Low Oil	hrs.	Stab Spacing		Formation	
DD Objectives Achieved	☐	If not, why?					

BIT

Bit Type	Tri-con	Other					
Manufacturer	Model	IADC Code	No. of Jets	Size of Jets	Bit TFA	Total Revs	Stick/Slip
HTC	MX03DX	589DC	3	16	0.552		Yes
Inner Row	Outer Row	Dull Char	Location	Brng/Seals	Gauge (1/16")	Other Char	Reason Pulled
1	1	CT	N	X	1/8	JD	16

FAILURE

Trans Fail	☑	Jamming	☐	Client Inconv.	☐	Surface Noise	☐
Pres Incr @ Fail	☐	Jamming Time	hrs.	Lost Time	hrs.	Down Hole Noise	☐
Trip Due to D&M	☐	Sync Hours	hrs.	Surface Vib	☐	Surface Sys Failure	☐

SUMMARY

PowerPulse transmission failure after drilling 60 meters into the formation. Continue drilling with constant parameters and monitor for drilling break and gas return that will indicate coring point. On surface 100% CDR and ISONIC recorded data were recoverred from the tool memory and processed and given to wellsite geologist. Visual insspection of PowerPulse tool found no obvious reason on why the tool has failed.

Schlumberger

DRILLING & MEASUREMENTS - BHA DATA

Job Number	AWA-02-17
Run Number	2
BHA Number	

Item	Description	Vendor	Material	Serial Number	Fishing Neck OD	Fishing Neck Length	Stab OD	OD	ID	Bot Connection Size	Bot Connection Type	Top Connection Size	Top Connection Type	Len	Cum Len
	UNITS				in	m	in	in	in	in		in		m	m
1	Bit	Reed		103926				12.25				6 5/8	Reg Pin	0.31	0.31
2	Near bit roller reamer			GU2151				12.25	3	6 5/8	Reg Box	6 5/8	Reg Box	2.44	2.75
3	CDR	Schlumberger		9556	10.125	4.68		9.4375	5.875	6 5/8	Reg Pin	7 5/8	H90 Box	7.54	10.29
4	MWD	Schlumberger		231				8.375	5.875	7 5/8	H90 Pin	6 5/8	FH Box	8.38	18.67
5	Inline Stab	Schlumberger			12.25	1.082	12.25	8.5	4.25	6 5/8	FH Pin	6 5/8	FH Pin	1.783	20.453
6	Isonic	Schlumberger		829	9	1.785		8.375	4.25	6 5/8	FH Box	6 5/8	Reg Box	7.282	27.735
7	String Roller Reamer						12.25			6 5/8	Reg Pin	6 5/8	Reg Box	2.44	30.175
8															
9															
10															
11															
12															
13															
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15															
16															
17															
18															
19															
20															
21															
22															
23															
24															

TIME/DEPTH DETAILS	1	2	3	4	5
Date/Time	10/1/2002				
Field Engineer	Chu				
Depth	1693				
Average ROP	27				
Avg. Std. Pres.	3949				
Desurger 1	2600				
Desurger 2	2600				
Tur. RPM @ FR	2578				
FR @ Tur. RPM	800				
Avg. RPM	120				
Max RPM	130				
Total Shocks	0				
Max Shock	0				
Avg. Surf. WOB	30				
Max Surf. WOB	35				
Avg. DH WOB					
Max DH WOB					
Avg. Surf. Torq.	8				
Max Surf. Torq.	10				
Avg. DH Torq.					
Max DH Torq.					
Formation Type					
Friction					
Drag Up					
Drag Down					
Mud Weight	10.1				
Funnel Vis.					
Plastic Vis.					
Circ. Temp	55				
Signal Strength	38				
Bit Deviation	90				
Differential Pres.					

PREDICTED BHA TENDENCY

Hookload		Wt. Below Jars	
Pickup Wt.		Wt. Above Jars	
Slack Wt.		Total Air Wt.	

Stabilizer Description	Mid Pt To Bit	BLADE Type	BLADE Length	BLADE Width	GAUGE Length	GAUGE In	GAUGE Out
UNITS	m		in	in	in	in	in

Bit To Read Out Port		Bit To Measurement Port	
PPL	12.04 m	D&I PPL	14.43 m
CDR	6.21 m	GR PPL	13.82 m
ISONIC	25.25 m	GR LWD	8.53 m
	m	RES LWD	5.05 m
	m	SON LWD	25.65 m
	m		m
	m		m

BATTERY Tool	Unloaded (V) Before	Unloaded (V) After	Loaded (V) Before	Loaded (V) After	Run Hrs BOT	Run Hrs AMP	Cum Hrs BOT	Cum Hrs AMP

Job Number:	AWA-02-17
Run Number:	2

Date	Time	Depth	Operating Details
30-Sep-02	23:31		Re-inits ISONIC
	23:13		Re-inits CDR
	23:30		Tool BRT
01-Oct-02	1:00		Good SHT
			RIH
	4:45	1600.00	Start pump and commence washing down.
	6:32	1647.00	Flow check.
	9:50	1696.00	Lost signal from MWD tool after making connection. Cycle pump several times without success.
			Perform check of sensor and cables and found no reason of surface failure. SPT1 and SPT2 reading the
			same pump harmonicss. There are no signal trace coming from modulator.
			Company man decided to drill ahead with control ROP @ 20m/hr and monitor for drilling break and Gas return.
	14:00	1763.00	2-12%gas monitored by mud loggers. Flow check. Circulate cuttings and gas out.
	15:32	1763.94	TD for the run. POOH and pick-up coring tool.
	10:30		Tool ART.
			Lay down tools.
	11:00		Dump CDR memory.
	11:30		Dump Isonic memory.
			All drilled interval logged in Recorded Mode.

Schlumberger — DRILLING & MEASUREMENTS - RUN SUMMARY

RUN INFORMATION

Job Number	Company Rep.	Date In	Date Out	D&M Run Number	Rig Run Number
AWA-02-17	SANTOS	2-Oct-02	4-Oct-02	3	6

Company	Schlumberger	Grid Corr	Brief Run Summary	Bit Run Number	Cell Manager
Rig Name	Ocean Bounty		Good Run	2	Antonino Abad
Well Name	Casino-2	Tot Corr	Hole Depth	D&M Crew	
Location	Bass Strait		From 1784 m To 2112 m	C. Tue	
Mapfile	Mag Dec	PP Slot ID	Inclination (Drift)	Pumping Hours	Below Rotary Tbl Hrs
			From 1.45 deg To 2.47 deg	21.7 hrs.	36.5 hrs.

BPS	Frequency	Mod Type	Azimuth	Rotary Hours	Rotary Distance
6	16 Hz	FSK	From deg To deg	16 hrs.	328 m
Pump Type	**Pump Output**	**Pump Strk Len.**	**True Vertical Depth**	**Slide Hours**	**Slide Distance**
12-P-160	603	12	From 1763 m To 2085.01 m	0.00 hrs.	0.00 m

Pump Liner ID	Min DLS	Max DLS	Hole Size	Water Depth	Air Gap	Drilling Hours	Drilling Distance
6			12.25 in	68 m	25 m	16 hrs.	328 m
Bent Sub Angle	**Bent HSG Ang**	**Depth Max DLS**	**RKB Height**	**Ground Elev.**	**Mod Gap**	**Reaming Hours**	**Reaming Distance**
deg	deg	m	25 m	-68 m	0.12 in	1.5 hrs.	21 m
Pulse Ht Thresh	**Min Pulse Wdt**	**Max Pulse Wdt**	**Digit Time**	**T/F Arc**	**T/F Angle**	**On Bottom Hours**	**Service**
				in	deg	16 hrs.	PP/CDR/ISONIC/IWW

Conn Phase Ang	Rise Const	Fall Const	H2S In Well	Damp Press	Signal Streng.	Last Casing	
deg			☐	1000 psi	32	Size 13.38 in	Depth 690.55 m

Directional Driller(s)	Turbine RPM @ Min Flow Rate		Turbine RPM @ Max Flow Rate	
	RPM 2617.19	FR 700 gpm	RPM 3476	FR 850 gpm

Run Objective

EQUIPMENT DATA

Equipment Code	Pump Hrs Start	Pump Hrs Cum	SW Vers	Tool Size	Equipment Code	Pump Hrs Start	Pump Hrs Cum	SW Vers	Tool Size	Sensors Code	Real Time Hrs	Real Time Fail	Real Time Drilled	Recorded Time Hrs	Recorded Time Fail	Recorded Time Drilled
ARC8A-AA-8031	0	21.7	6.4B01	8.25						ARC8A-AA-8031	21.7	☐	349	36.5	☐	349
MDC-DB-130	0	21.7	61C00	8.25						MDC-DB-130	21.7	☐	349		☐	
SWD8-BA-829	58.7	80.4	5.0B 10	8.00						SWD8-BA-829	21.7	☐	349	36.5	☐	349
SZR-PA-360716	58.7	80.4		8.25								☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	
												☐			☐	

Surface Sys	IDEAL/SPM
Version	ID7_0C_02

DH MOTOR

Manufacturer		Stage Length	m	Bit to Bend Dist.	m	Bearing Gap In	
Type		Rubber		RSS Mfr		Bearing Gap Out	
Size		Sleeve Position		RSS Type		Radial Bearing Play	
Serial Number		Sleeve Size	in	RSS Size		Thrust Bearing Play	
Lobe Config.		Motor Fail	☐	RSS SN			

OPERATING COND.

Max Circ Temp	70.00 C	Avg ROP	20.50 m/hr	Min Actl FlowRt	700.00 gpm	Max Shock Dur	0.20 sec.
Min Circ Temp	30.00 C	Max ROP	30.00 m/hr	Avg PmpPres	3215.00 psi	Total DH Shocks (k)	8.32 k
End Mud Wt	10.30 lb/gal	Avg Surf RPM	130.00	PmpPres On Bot	3186.00 psi	CHECK SHOT	
End Funnel Vis	57.00 CPS	Min RPM	120.00	PmpPres Off Bot	psi	Type	
End Plastic Vis	21.00 CPS	Max RPM	160.00	Avg Surf WOB	35.00 lbs	Depth	m
End Yield Point	23.00 CPS	Avg FlowRate	800.00 gpm	Avg Surf Torq	9.00 ft-lbs	Inclination	deg
End Mud Resist	0.1459	Max Actl FlowRt	850.00 gpm	Max Shock Lev	0	Azimuth	deg

MUD

Company	IDFS	PH	9.50	Percent Sand	0.50 %	Additives	
Brand		Chlorides	31500	Percent Solids	10.80 %	Clean	☐
Type	KCl	Other		Percent Oil	0.00 %		
LCM Type				LCM Size		LCM Concentation	

BHA

BHA Type	Rotary	Tur Rotor Prt #		Turbine Config		Surface Screen	☐
Int TF Offset		Stator Prt #		Pulser Config		DFS Used	☐
Low Oil Flag	☐	Hrs @ Low Oil	hrs.	Stab Spacing		Formation	Sandstone
DD Objectives Achieved	☐	If not, why?					

BIT

Bit Type	PDC	Other					
Manufacturer	Model	IADC Code	No. of Jets	Size of Jets	Bit TFA	Total Revs	Stick/Slip
Hycalog	SX195		6	15	0.552		Yes
Inner Row	Outer Row	Dull Char	Location	Brng/Seals	Gauge (1/16")	Other Char	Reason Pulled
0	4	BT	A	X	1	JD	16

FAILURE

Trans Fail	☐	Jamming	☐	Client Inconv.	☐	Surface Noise	☐
Pres Incr @ Fail	☐	Jamming Time	hrs.	Lost Time	hrs.	Down Hole Noise	☐
Trip Due to D&M	☐	Sync Hours	hrs.	Surface Vib	☐	Surface Sys Failure	☐

SUMMARY

Excellent run with good real-time signal. Ream down log coring interval @ 30-40 m/hrs in realtime and recorded mode. Very little shocks monitored during reaming of the coring interval and drilling to TD. Recovered all memory data from the ARC and Isonic tools.

Schlumberger

DRILLING & MEASUREMENTS - BHA DATA

Job Number	AWA-02-17
Run Number	3
BHA Number	

Item	Description	Vendor	Material	Serial Number	Fishing Neck OD	Fishing Neck Length	Stab OD	OD	ID	Bot Connection Size	Bot Connection Type	Top Connection Size	Top Connection Type	Len	Cum Len
	UNITS				in	m	in	in	in	in		in		m	m
1	Bit	Reed		103926				12.25				6 5/8	Reg Pin	0.31	0.31
2	Near bit roller reamer			GU2151				12.25	3	6 5/8	Reg Box	6 5/8	Reg Box	2.44	2.75
3	ARC8	Schlumberger		9556	10.125	4.68		8.25		6 5/8	Reg Pin	6 5/8	FH	5.73	8.48
4	MWD	Schlumberger		130				8.375		6 5/8	FH	6 5/8	FH Box	8.42	16.9
5	Inline Stab	Schlumberger			12.25	1.082	12.25	8.5		6 5/8	FH Pin	6 5/8	FH Pin	1.783	18.683
6	Isonic	Schlumberger		829	9	1.785		8.375		6 5/8	FH Box	6 5/8	Reg Box	7.282	25.965
7	String Roller Reamer						12.25		3	6 5/8	Reg Pin	6 5/8	Reg Box	2.44	28.405
8															
9															
10															
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18															
19															
20															
21															
22															
23															
24															

TIME/DEPTH DETAILS	1	2	3	4	5
Date/Time	10/3/2002	3-Oct			
Field Engineer	Chu	A. Abad			
Depth	1836	2095.87			
Average ROP	20	15			
Avg. Std. Pres.	3165	3215			
Desurger 1	1000	1000			
Desurger 2	1000	1000			
Tur. RPM @ FR	2773	2812			
FR @ Tur. RPM	850	861			
Avg. RPM	155	160			
Max RPM	174	175			
Total Shocks	0	8.32			
Max Shock	0	0.2			
Avg. Surf. WOB	19	30			
Max Surf. WOB	21	35			
Avg. DH WOB					
Max DH WOB					
Avg. Surf. Torq.	9	9			
Max Surf. Torq.	10	10			
Avg. DH Torq.					
Max DH Torq.					
Formation Type	Silty Sand	SiltySand			
Friction					
Drag Up					
Drag Down					
Mud Weight	10.1	10.1			
Funnel Vis.					
Plastic Vis.					
Circ. Temp	70	70			
Signal Strength	26	26.4			
Bit Deviation	95	95			
Differential Pres.					

PREDICTED BHA TENDENCY

Hookload		Wt. Below Jars	
Pickup Wt.		Wt. Above Jars	
Slack Wt.		Total Air Wt.	

Stabilizer Description	Mid Pt To Bit	BLADE Type	BLADE Length	BLADE Width	GAUGE Length	GAUGE In	GAUGE Out
UNITS	m		in	in	in	in	in

Bit To Read Out Port		Bit To Measurement Port	
PPL	10.41 m	D&I PPL	12.76 m
ARC	6.23 m	GR PPL	12.19 m
ISONIC	23.46 m	GR LWD	5.09 m
	m	RES LWD	5.11 m
	m	SON LWD	23.86 m
	m		m
	m		m

BATTERY Tool	Unloaded (V) Before	Unloaded (V) After	Loaded (V) Before	Loaded (V) After	Run Hrs BOT	Run Hrs AMP	Cum Hrs BOT	Cum Hrs AMP

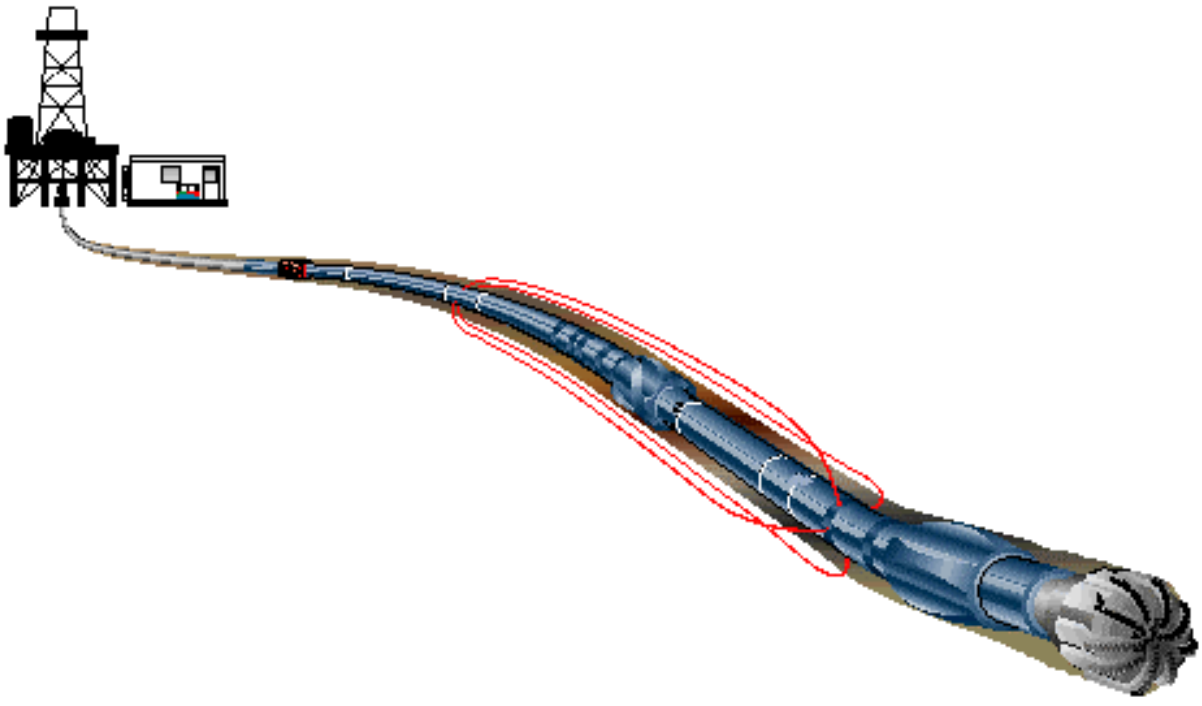
Job Number:	AWA-02-17
Run Number:	3

Date	Time	Depth	Operating Details
02-Oct-02	19:54		ARC Inits.
	20:34		ISONIC Inits.
	22:00		Tool BRT.
	23:23		Good SHT. SPT1=42 psi @ 700 GPM.
03-Oct-02	2:45	1554.00	Hook-up Geolograph cable and Set depth to start logging of coring interval.
	3:00	1740.00	Start logging coring interval. ROP 30-40 m/hr to get good quality ISONIC data.
	4:30	1784.00	Tag bottom and commence drilling.
	22:58	2106.00	Drilling ahead. ROP has slowd down from 20 m/hr to 16 m/hr.
	23:25	2112.46	Reached well TD. Cycle pumps to take survey.
			Commence circulate bottoms up.
04-Oct-02	10:30		Tools ART.
	11:00		Dump Isonic
	12:00		Dump ARC.
			All recorded data recovered from the tools including the coring interval
			Mud Sample: Rm=0.1459@21.7, Rmf=0.1285@22.8, Rmc=0.242@23.3

Schlumberger

IDEAL

Failure Report and Analysis



Schlumberger

DRILLING & MEASUREMENTS - FAILURE REPORT

Company:	Schlumberger	Well:	Casino-2	Job Number:	AWA-02-17
Rig Name:	Ocean Bounty	Location:	Bass Strait	Run Number:	2
Cell Manager:	Antonino Abad	Fail. Date:	1-Oct-02	Failure Number:	1
Hrs BRT @ Fail	11 hrs.	Pump Hrs @ Fail	5 hrs.	Drill Hrs @ Fail	4 hrs.
Service:	PP/CDR/ISONIC/IWW			Depth @ Fail	1696.0
Failed Equipment	MDC-DC-231				

FAILURE DESCRIPTION & SYMPTOMS

No signal from MWD tool after making connections at depth of 1696m.

Severity ID:	n	Completed By:	A. Abad	Date:	1-Oct-02

REMEDIAL ACTION ATTEMPTED ON LOCATION

Inspected all surface sensors and cables but found nothing that can cause signal loss. HSPM scope meter reading pump harmonics from SPT1 and SPT2 indicating sensors are good. Cycle pumps a few times but no signal from MWD tool. Increased flow rate and no success either. Decision was made to drill ahead with constant drilling parameters and monitor for drilling break and gas return.On surface, attempted to communicate with the tool thru ROP with no success. LTB impedance present on the extender.

Lost Rig Time:	0.00	Completed By:	A. Abad	Date:	2-Oct-02

FAILURE ANALYSIS

OBJECT (What Failed?)	While a failure is developing at a wellsite, ensure that you apply your location's failure handling instructions. It is critical at this stage to record events, symptoms, tool snapshots, and any other diagnostic data. This will become invaluable for proper failure follow-up and for deciding the course of action to take. In the Base, it is important to reproduce the failure, debrief the events, and close the failure with an appropriate Corrective Action Plan that encompasses all causes.
DAMAGE (How did it fail?)	
CAUSE (Why did it fail?)	
TASK (Action Plan to Take)	