SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

UBIE-005S

PB VALVE RE-CALIBRATION PROPOSAL

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1. OBJECTIVE

To restore UBIE005S on the E1000M interval to production by retrieving and recalibrating the PB valve on the string. This activity will restore a risked potential of ca. 850 bopd and safeguard a base case resource volume of 1.45 MMstb of oil production.

2. WELL HISTORY

UBIE005 was initially completed as a TSD oil producer on E1000M and the E3000M reservoirs in June 1972.

UBIE005S: E1000M (8296- 8300 ftah SCON)

This interval came on stream in 1973 and attained peak production of 1979 bopd in 1974. Historically, UBIE005S is the most prolific producer from this reservoir, having a cumulative production of 7.4MMbbls with only a few shut-in periods. HGOR production was recorded in 1990 which necessitated a bean down to reduce the GOR. The well was later beaned up from bean 20/64 to bean 28/64th inch and in 1997, the well was shut in again for HGOR.

The interval was secured with downhole plug and NRV in 2009 and remained closed-in following the station vandalization and community disturbances in UBIE until 2020 when the re-entry campaign was done. The flowline was restored for the well with the plugs retrieved and PB Valve installed. Production re-commenced in July 2020 until January 2021 when the PB Valve tripped close. Interval has remained closed-in till date.

Last well test in December 2020 gave the following parameters: 861bopd, 0.1% BS&W, THP of 522psig on bean 20/64".

3. ANALYSIS/JUSTIFICATION

UBIE005S is one of the producing wells in UBIE post the field re-entry in 2020. The well produced satisfactorily after the open up in July 2020 at 0% BS&W until the PBV tripped closed in January 2021.

It is recommended to re-calibrate the PB valve using the well test parameters as given in Section 5 below and restore the well to its last production performance. This will safeguard a potential of 850 bopd and 1.45MMstb oil reserves from the E1000M reservoir.

4. PROPOSAL SUMMARY

1. Check and record wellhead pressures.
2. Carry out wellhead maintenance
3. Retrieve PB valve in tubing.
4. Flow the well for minimum of two days to record flowing pressures.
5. Recalibrate and re-install recalibrated PB valve.
6. Open up well and monitor performance.
7. Hand over well to Production Operations team.

5. WELL & RESERVOIR DATA

Recent Well Test Data

Start Date	Well	Choke Size	BS&W [%]	Gross oil rate (bbls/d)	Net Oil Rate [bopd]	GOR Scf/Bbl	Well Head Pressure [psig]
09/08/2020	UBIE005S	18	0.0	440	439	76	508
11/08/2020	UBIE005S	18	0.0	450	450	74	500
12/08/2020	UBIE005S	20	0.0	732	732	52	479
16/08/2020	UBIE005S	20	0.0	740	740	52	479
18/08/2020	UBIE005S	22	0.0	826	826	48	464
20/08/2020	UBIE005S	22	0.0	783	782	50	464
25/08/2020	UBIE005S	24	0.0	1,117	1,117	41	435
26/08/2020	UBIE005S	24	0.0	1,122	1,122	41	435
29/11/2020	UBIE005S	20	0.0	841	840	63	479
08/12/2020	UBIE005S	20	0.1	862	861	66	522

Well & Reservoir General Data

S/N	WELL/SAND:	UNIT	UBIE005S (E1000M)
1	a) Completed interval b) Completed interval	ftah bdf fttvdss	8296 – 8300 8242 – 8246
2	a) Maximum Deviation Angle and Depth b) Derrick Floor Elevation	° @ ftah ft	5.25 @ 8500 48
3	a) Last Production Rate (Dec 2020) b) Estimated Potential	bopd bopd	861 850
4	a) Reference Depth for Reservoir Pressures b) Original Reservoir Pressure c) Current Reservoir Pressure (2009 BHP) d) Present Gradient e) Bubble Point Pressure f) Specific Gravity of Oil 60/60 g) Oil Viscosity at Reservoir Condition h) Solution Gas-Oil-Ratio, Rsi (initial condition) i) Formation Volume Factor (initial condition) j) Static Reservoir Temperature	ftss psia psia psi/ft psia SG cP scf/bbl - ° F	8260 3620 3105 0.376 3609 0.91 2.08 510 1.226 154
5	a) Tubing Size/Weight b) Casing Size/Weight	in/ibs/ft in/ibs/ft	2.375 / 4.6 7 / 23
6	a) Sand exclusion type	-	SCON

6. COST ESTIMATE

UBIE 5S PB VAVLE RECALIBRATION						
ACTIVITY	UNIT RATE ($)	UNIT RATE(N)	QTY/DURATION	UNIT	USD	NGN
SLICKLINE SERVICES	1500		7	DAYS	10,500.00	
WHM SERVICES	1200		7	DAYS	8,400.00	
TEST PUMP	600		7	DAYS	4,200.00	
PB VALVE CALIBRATION	1,500		1	EACH	1,500.00	
COMMUNITY		80,000	1	ONCE		80,000
COMMUNITY LABOUR		40,000	7	DAYS		280,000
SECURITY		123,000	7	DAYS		861,000
			TOTAL		24,600.00	1,221,000.00

7. HSSE/ SPECIAL WELL/LOCATION CONDITION

Condition of wellhead	Okay
Last annulus pressure measurement (A-annulus)/Date	0psi/ 7th June 2021
MAASP	A-annulus- 1241 psi
Well integrity summary	Action Code 6 Short String – Swab valve leaking Long String – Lower Master Valve and Swab valve leaking
Any problem during last re-entry	No
Location condition	Well is accessible
Flowline status	Okay
Seasonally flooded	Yes

8. RISKS AND MITIGATION

Risks	Potential (L/M/H)	Justification	Impact on Costs or Rewards	Mitigation
Stuck tool/BHA in hole	L	There exists a risk of getting the tools/BHA stuck in hole during the operation.	NPT and increase in well intervention cost.	Verify BHA outer diameter against well tubing Internal diameter. Follow procedures for tool make up. Use experienced staff and adhere to appropriate standards and procedures to minimize chance of failure.
Loss of primary containment	L	Although well is currently integral, there is still the possibility of inadvertent release of hydrocarbon into the surrounding environment.	Well intervention cost could be higher depending on the extent of environmental pollution.	Use appropriate wireline BOP. Observe all safety precautions.
PB Valve frequent trips/Malfunction / Failure	M	Post installation, the PB valve may be at risk of frequent trips or other failure modes.	Well integrity implications due to compromised primary well barrier. Well intervention /workover cost to replace or repair failed PB valve.	Closely monitor wellhead pressures to proactively detect PB valve failure. Re-calibrate PB valve, if required. Adopt & follow good recommended OEM practice by not opening or closing the well too fast to inadvertently trip PB valve installed

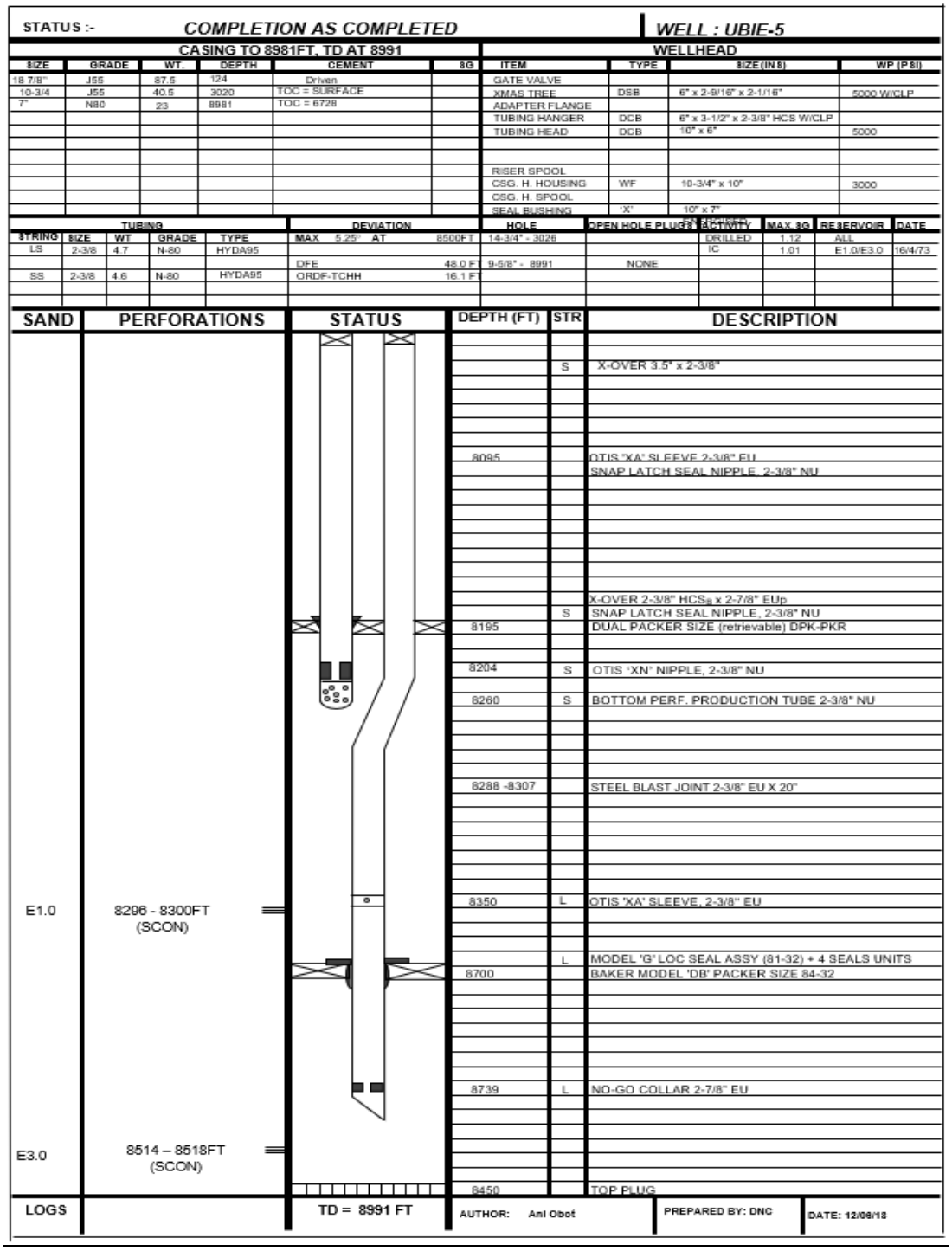
9. LIST OF APPENDICES

Appendix 1: Well Status Diagram

Appendix 2: Performance Plot (OFM)

10. APPENDIX

Appendix 1: Well Status Diagram



STATUS :- COMPLETION AS COMPLETED — WELL : UBIE-5

CASING TO 8981FT, TD AT 8991

SIZE	GRADE	WT.	DEPTH	CEMENT	SG
18 7/8"	J55	87.5	124	Driven	
10-3/4	J55	40.5	3020	TOC = SURFACE	
7"	N80	23	8981	TOC = 6728	

WELLHEAD

ITEM	TYPE	SIZE (IN S)	WP (P SI)
GATE VALVE			
XMAS TREE	DSB	6" x 2-9/16" x 2-1/16"	5000 W/CLP
ADAPTER FLANGE			
TUBING HANGER	DCB	6" x 3-1/2" x 2-3/8" HCS W/CLP	
TUBING HEAD	DCB	10" x 6"	5000
RISER SPOOL			
CSG. H. HOUSING	WF	10-3/4" x 10"	3000
CSG. H. SPOOL			
SEAL BUSHING	'X'	10" x 7"	

TUBING STRING	SIZE	WT	GRADE	TYPE
LS	2-3/8	4.7	N-80	HYDA95
SS	2-3/8	4.6	N-80	HYDA95

DEVIATION: MAX 5.25° AT 8500FT; DFE 48.0 FT; ORDF-TCHH 16.1 FT

HOLE: 14-3/4" - 3026; 9-5/8" - 8991

OPEN HOLE PLUGS: NONE

ELECTRICITY	MAX SG	RESERVOIR	DATE
DRILLED	1.12	ALL	
IC	1.01	E1.0/E3.0	16/4/73

SAND	PERFORATIONS	STATUS	DEPTH (FT)	STR	DESCRIPTION
				S	X-OVER 3.5" x 2-3/8"
			8095		OTIS 'XA' SLEEVE 2-3/8" EU
					SNAP LATCH SEAL NIPPLE, 2-3/8" NU
					X-OVER 2-3/8" HCS8 x 2-7/8" EUp
				S	SNAP LATCH SEAL NIPPLE, 2-3/8" NU
			8195		DUAL PACKER SIZE (retrievable) DPK-PKR
			8204	S	OTIS 'XN' NIPPLE, 2-3/8" NU
			8260	S	BOTTOM PERF. PRODUCTION TUBE 2-3/8" NU
			8288 -8307		STEEL BLAST JOINT 2-3/8" EU X 20'
E1.0	8296 - 8300FT (SCON)		8350	L	OTIS 'XA' SLEEVE, 2-3/8" EU
				L	MODEL 'G' LOC SEAL ASSY (81-32) + 4 SEALS UNITS
			8700		BAKER MODEL 'DB' PACKER SIZE 84-32
			8739	L	NO-GO COLLAR 2-7/8" EU
E3.0	8514 – 8518FT (SCON)				
			8450		TOP PLUG

LOGS | TD = 8991 FT | AUTHOR: Ani Obot | PREPARED BY: DNC | DATE: 12/06/18

Appendix 2: Well Performance Plot