

Internal Investment Proposal

Business unit	Upstream International Operated, Nigeria/Gabon, Shell Petroleum Development Company of Nigeria Limited (SPDC)																									
Shareholders / partners	SPDC 30%, Nigeria National Petroleum Corporation (NNPC: 55%), Total Exploration & Production Nigeria Limited (TEPNL: 10%), Nigeria Agip Oil Company (NAOC: 5%) in SPDC-JV where SPDC is the Operator.																									
Project	ZARAMA-015 HOOK UP																									
Amount (Shell share) MOD, 50/50	USD 5.62 Mln Capex <table><tr><th>PHASES</th><th colspan="2">2016 (USD)</th></tr><tr><td rowspan="2">Capex (MOD)</td><th>DAYS</th><th>COST</th></tr><tr><td colspan="2">ZARA-015</td></tr><tr><td>Procurement and delivery</td><td>10</td><td>17,400,000</td></tr><tr><td>Line Pipe Coating</td><td>1</td><td>375,000</td></tr><tr><td>Line Construction</td><td>1</td><td>950,000</td></tr><tr><td>Total 100% JV (MOD)</td><td></td><td>18,725,000</td></tr><tr><td>Shell Share</td><td></td><td>5,617,500</td></tr></table>			PHASES	2016 (USD)		Capex (MOD)	DAYS	COST	ZARA-015		Procurement and delivery	10	17,400,000	Line Pipe Coating	1	375,000	Line Construction	1	950,000	Total 100% JV (MOD)		18,725,000	Shell Share		5,617,500
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Reserves / Resources	This project is aligned with SPDC’s strategic goals and priorities by maturing 2P proved undeveloped reserves of 28.7 Bscf of NAG and 0.16 MMstb of condensate (SS) to production and transferring equivalent SEC Proved reserves from PUD to Prove Developed in 2016.																									
Production	Gas production from this project peaks at 37 MMscf/d with associated condensate production of 630 bopd (11 MMscf/d and 189 bopd SS) by 2016 (the production rate is constrained by integrated SPDC forecasting model assumptions), thus contributing towards keeping NLNG T1-6 full, and a quick win opportunity of keeping Gbaran Ubie CPF at full capacity of 1.2Bscf/d.																									
Source and form of financing	This investment will be financed from JV funding. Shell share capital expenditure will be met by SPDC’s own cash flow and/or the existing shareholder facility.																									

Proposal Management Summary

This proposal seeks approval for the hook up of ZARA-015 gas well post well completion planned for Q4 2016. ZARA-015 was primarily an appraisal well into the Eastern flank of the Uzu field, but was also proposed, in case of appraisal success, to develop 171 Bscf of NAG, carried for E1000 (113 Bscf) and E7000 (58 Bscf) reservoirs at a rate of 50MMscf/d, in a sequential bottoms up approach. ZARA-015 was drilled in July 2013, but yet to be completed.

Ongoing Uzu field Studies based on the appraisal results and new seismic data / interpretation however indicate:

- A downward revision in reward for ZARA-015 completion to 43.5 Bscf; 38 Bscf for E1000 and 5.5 Bscf for E7000.
- Thus, E7000 completion not economical from ZARA-015 location, therefore a drainage point to the west of accumulation is preferred, and would be planned.
- Alternate completion target, C5200 reservoir, exists and thus used to replace E7000. Expected reward from C5200 is 57.6 Bscf.

The objective of this proposal is to secure budget for the hook up of ZARA-015 post the well completion, and thus add a post-drill updated potential of 40MMscf/d production from the well. Total Shell share Capex is USD \$5.62mln. Internal technical alignment has been obtained.

Project Background:

ZARA-015 (ex- WPUX-01) is an appraisal well proposed by the Uzu Initial Development Plan to appraise the Partially Appraised Uzu Field (PAF) located in OML 28, discovered by Uzu-001 in 1971. The appraisal objectives were to reduce the following uncertainties:

- Eastern flank structural control
- Hydrocarbon Distribution and extent
- Fluid contact (OWC) in F1000X
- Fluid composition (CGR/CO2)

In case of appraisal success, ZARA-015 was planned to be used for a development objective by completing the well on E1000X and E7000X NAG reservoirs as a single string dual completion, for a sequential production from the deeper E7000X reservoir first, at an initial rate of 50 MMscf/d of gas. The well was expected to develop 171 Bscf, carried for E1000 (113 Bscf) and E7000 (58 Bscf). A later study of the subsurface interpretation using appraisal results and the newly processed Greater Gbaran seismic data was expected to subsequently form basis of an optimised full field development plan.

ZARA-015 has been drilled and temporarily suspended. Also, the planned Uzu field Study is currently being carried out in the FES team based on:

- New well control in the East: ZARA-015
- New Seismic interpretation: 9 levels re-interpreted including E1000 and E7000 Levels

- New velocity model (for depth conversion): built/applied integrating all available relevant Geosciences data.

Study has passed DG2.

A result from this study has indicated that the pre-appraisal development objectives of ZARA-015 are not achievable. The following summarise the study results, with respect to ZARA-015 objectives:

- Updated downward revision in reward for ZARA-015 completion to 43.5 Bscf; 39 Bscf for E1000 and 5.5 Bscf for E7000.
- E7000 completion not economical from ZARA-015 position. A drainage point to the west of accumulation is preferred, and now planned. Presence of saddle close to the eastern part of the reservoir made volume accessible to be drained on this interval from ZARA-015 position negligible (as stated above).
- Alternate completion targets (C1000 and C5200) exist to replace E7000, in order to make the completion of this well economical, while not jeopardising full field recovery optimisation.
- C5200 was selected to replace the E7000 reservoir for the completion of ZARA-015. Expected reward from C5200 is 57.6 Bscf.

While budget for ZARA-015 completion has been provided for in the appraisal drilling and completion proposal, the hook up cost is being sourced with this IP.

Value Proposition and Economic Summary

This project aligns with SPDC's strategic objectives and will contribute towards keeping NLNG T1-6 full. The project represents a quick win opportunity of keeping Gbaran Ubie CPF at full capacity of 1.2Bscf/d. In addition, the project will:

- Mature 2P reserves of 95.6 Bscf of NAG and 0.53 MMstb of condensate (SS).
- Add potential of 40MMscf/d from 2017.

Production Forecast

The production forecast for ZARA-015 is shown in Table 1. Forecast vintage is the Corporate OP14 forecast. Production rate is constrained by integrated SPDC forecasting model assumptions and demand-allocation dependencies.

Table 1: ZARA-015 Production forecast

Year	NAG Produced Rate (Mscf/d)	NAG Sales Rate (Mscf/d)	NAG Flare Rate (Mscf/d)	NAG Own use Rate (Mscf/d)	Condensate Rate (bbl/d)
2017	37,160	36,887	138	134	630
2018	35,279	34,988	131	160	363
2019	2,256	2,222	8	26	15
2020	541	539	2	0	3
2021	1,669	1,654	6	9	10
2022	4,355	4,305	16	34	22
2023	6,840	6,766	25	48	33
2024	18,573	18,426	69	78	86
2025	20,314	20,142	75	96	87
2026	20,314	20,118	75	121	80
2027	19,682	19,468	73	141	70
2028	13,210	13,050	49	112	43
2029	6,856	6,763	25	67	21

Summary Economics

The economics for this IP was carried out on a forward-looking basis using the project 50/50 level III cost estimate and the production forecast of Zarama wells.

Sensitivities were carried out on the base case to reflect project performance under different scenarios. These include:

- High CAPEX
- Low CAPEX
- Full Life Cycle
- 1-year Project delay
- 1.5% BVA

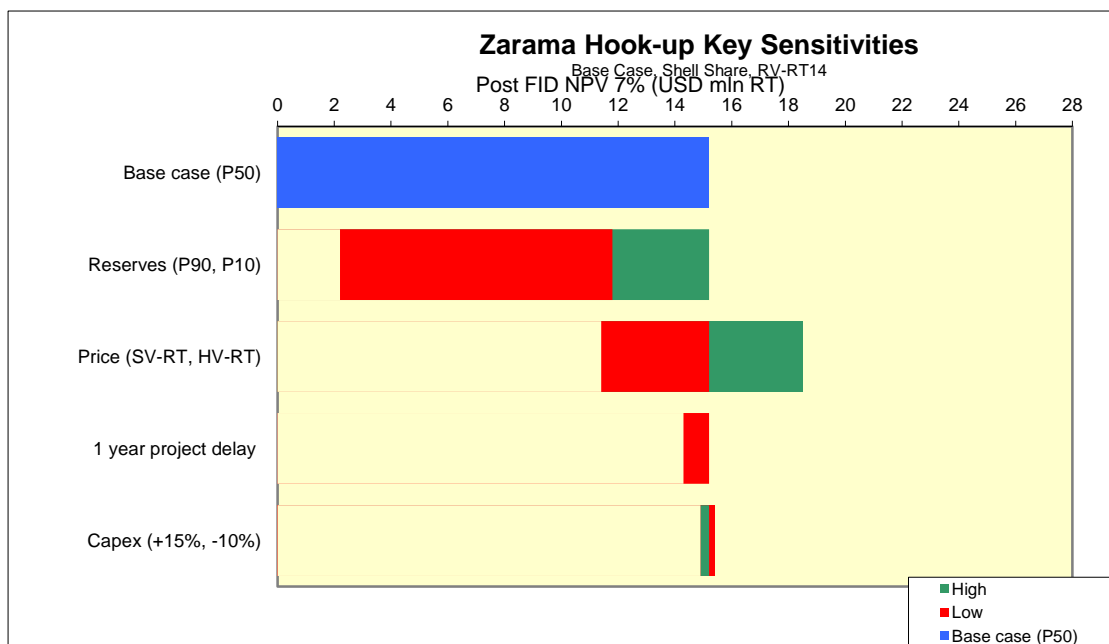
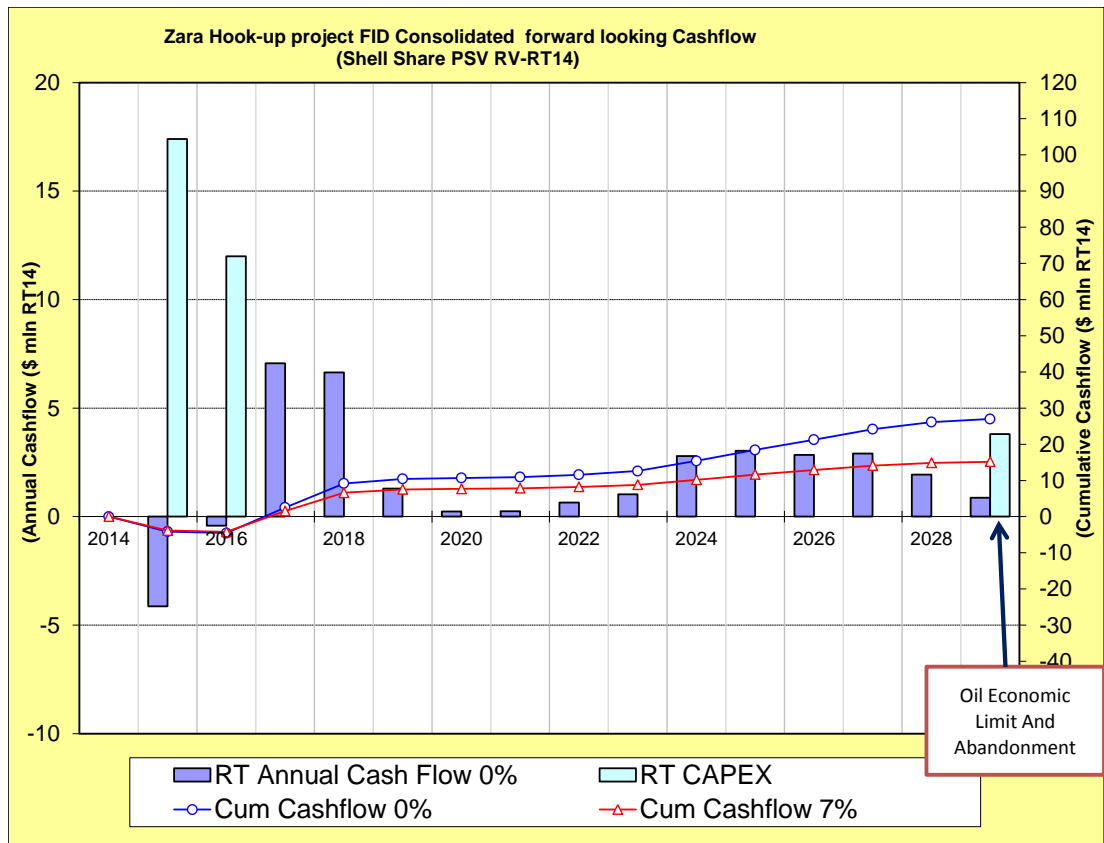
From the results shown in Table 2, the project returns a positive NPV7% and VIR of <0.4. Economics details are shown below:

Table 2 Shell-Share RV-RT14

PV Reference Date: 1/07/2014	NPV (S/S \$ mln)		VIR	RTEP	UTC (RT \$/boe)		Payout-Time (RT)	Maximum Exposure (AT)
Cash flow forward from: 01/01/2014	0%	7%	7%	%	0%	7%	yyyy	\$ mln (YYYY)
Base Case								
SV-RT (\$1.20/Mscf RT14)	20.6	11.4	1.46	53.0			2017	4.6 (2016)
RV-RT (\$1.68/mscf RT14)	27.0	15.2	1.95	65.0	2.75	3.91	2017	4.6 (2016)
HV-RT (\$1.82/Mscf RT14)	32.7	18.5	2.38	75.4			2017	4.6 (2016)
High reserves		11.8	1.51					4.6 (2016)
Low reserves		2.2	0.28					4.6 (2016)
High Capex (+15%)		14.9	1.66					5.2 (2016)
Low Capex (-10%)		15.4	2.19					4.1 (2016)
1 year project delay		14.3	2.00					4.5 (2017)
Full Life Cycle		13.5	0.81					6.2 (2016)
1.5% BVA		15.2	1.95					4.6 (2016)

Economic assumptions

- Condensate PSVs of \$90/bbl @RV-RT14 with Bonny offset applied.
- Nigerian Gas Master Plan (NGMP) gas price profile RT2014 was applied for solution gas.
- Gas assumed to be treated under CITA with AGFA incentive
- Condensate assumed to be treated as oil, therefore taxable under PPT (Tax rate of 85%)
- Flare Charge of \$3.5Mscf
- Gas Heating Value (GHV) of 1000btu/scf
- NDDC levy of 3% total expenditure.
- Education tax of 2% assessable profit.
- Abandonment cost is estimated at 10% of RT CAPEX



Risks and Alternatives

The key risks and mitigation factors for the project are discussed in Table 3

Table 3: Projects Risks and Mitigation.

Risks	Description	Mitigation
Funding (NNPC not able to fund its own equity share)	Getting NAPIMS to fund her equity share directly or through MCA may be a challenge. This might lead to schedule and cost overruns.	Early engagement of NAPIMS
Delay in approval from NAPIMS /DPR	There is a risk that we may not receive the approvals from NAPIMS / DPR on time hence delaying the actual ordering of line pipes and planning for this activity by Asset Engineering.	Engage NAPIMS / DPR early using avenues like the QMR to seek their initial buy in.
Contracting, Late arrival of hook-up materials	Ten months lead time is required post ordering to get the required pipeline to site. Late arrival of pipeline can cause reasonable delay in executing project.	Use existing contract and carry out project as infill drilling activity. Speed up process of getting the GIP approved, budget loaded and pre-order materials latest by Q1 2015.
Well Control	Uncontrolled release of hydrocarbon into the environment, leading to: <ul style="list-style-type: none"> • Spill and environmental • Fire • Loss of well • Loss of life • Damage to asset 	<ul style="list-style-type: none"> - Ensure completion fluid, spacers and other fluids used during completions have the required overbalance over the reservoir fluid gradient - Ensure required well control equipment are available, pressure tested and in good condition (BOP, Gray Valve, Kelly cock, Well control X-over etc) - Refer to Well Control Procedures Manual
Integrity	Poor swellable packer sealing capacity Tubing leak Production packer integrity Leading to well integrity issues like high casing head pressure, etc.	<ul style="list-style-type: none"> • Install multiple (2) swellable packers in tandem to provide backup • Ensure all connections are properly done. • Ensure packer is not set across a casing collar to avoid leakage • Adhere strictly to manufacture's setting procedure, special handling procedure for 13% Cr tubing, and pressure test A-annulus to confirm packer integrity
Completion Operation challenges	Failure of the ICV to respond to surface control signal Inability to deploy screens to bottom	<ul style="list-style-type: none"> • Troubleshoot the ICV in line with the troubleshooting matrix/ guideline • Carryout proper hole cleaning to ensure screen gets to bottom • Include centralizer to the work string giving it more weight to push lower completion to bottom
Social Performance	Community issues arising from unmet expectations from Gbaran Phase 1 project	Proactive engagement of communities, payment of GMoU top up fund on time.

Risks	Description	Mitigation
Flooding	Uzu field is located within potential flooding prone areas. In case of serious flooding, quick intervention efforts could be hindered. Also the completion operation schedule could be adversely affected.	Use Geomatics team to monitor closely flood forecast. Use pumping spread attached to any rig in the area.
Security	Security challenge in the Niger Delta. UZU field location is generally Amber (medium risk) with stealing, land dispute and internal communal wrangling being the major security threats.	Ensure LTO is obtained and implement MoU. Put security plan in place and ensure strict adherence. The security plan to cover the operations in the field with external JTF expected to provide the necessary security cover. The location will be fenced to provide restricted access control and access will be for only authorized personnel. All movements between the rig and town shall be with security escort.
Safety and environment	Contamination from Drilling Fluid and Cuttings	<ul style="list-style-type: none"> • The Environmental Permit must be obtained and visibly displayed prior to starting operations • Zero discharge to environment must be complied with. • Waste shall be segregated and recorded prior to shipment to SPDC approved sites for disposal. • WBM cuttings will be kept in a surface coral and used to backfill the waste pit after completing the well. The fluid stream will be treated on the site

Opportunities:

This project is hinged on maximizing value from the usage of an existing well to develop reservoirs in the Uzu field as part of a full field development plan.

Alternatives

ZARA-015, by virtue of its location to the flank of the field, is not optimal to be used for development of many of the mainly NAG reservoirs in Uzu field. The well is primarily an appraisal well. However, it is best positioned to drain the Uzu E1000 reservoir western flank, which is separated by a saddle from the rest of the accumulation.

The only alternative to this project is to drop the development objective of the well, and abandon it as an appraisal only well. In this case, the recoverable volume of 38Bscf from the E1000 reservoir western flank would be lost, as no commercial well can be planned to target that volume at the reservoir depth, in the future.

Carbon Management

All produced gas will be evacuated via Gbaran CPF. Carbon emission will be minimal as is currently the practice in the field.

Governance

This proposal is within the SPDC corporate structure and governance framework.

Group and Business Standards

This proposal and the execution of the project are consistent with the Group Business standards. Functional supports for this proposal have been provided by Technical, Finance, Legal, Treasury, Social Performance and Tax functions etc. Structure exists within contracting team to handle and support standard operations and requirements of the nature of this workover.

Project Management, Monitoring and Review

The execution of the project is managed through the Land East Field Development & Execution Team, Wells and Engineering Hub Teams in line with the UIO/G organizational model. The Sustainable Development and Community Relations directorate is instrumental in creating the community relations that allow the team to operate. There will be regular progress report of the well delivery activities to Development Manager Onshore, the Development General Manager and to the JV Partners. All significant reviews and follow up actions had been done in the Development and Engineering Teams. Following successful completion, the wells will be handed back to the Land East Production Operations Team.

Budget Provision

This project has been included in the 2014/15 JV Programme. The project is proposed to be financed via JV funding for SPDC projects.

Group Financial Reporting Impact

This hook-up project will result in converting undeveloped reserve to developed reserve. The cost of the project will be capitalised and depreciated in line with Group policy. The initial

outlay will hurt cash. Production from restored reserves will boost midstream gas supply to NLNG, which will be a help to revenue, NIAT and cash.

Disclosure

Material disclosures, if any, will be done in line with the Group and SPDC Disclosure policies and guidelines.

Financing

This investment will be financed with SPDC JV funding, so formal JV approval will be required from the SPDC JV partners. The Shell share of the investment will be financed by SPDC’s own resources.

Taxation

There are no unusual Taxation features.

Final Signature (Optional – all support and approvals done in eIP)

for : Upstream International Operated, Nigeria	
Van Bunnik, Jan SPDC Finance Director	Ojulari, Bayo GM Development

Appendix A - Detailed Project Parameter Data

Project Focal Point / Indicator	Ejiuwa Nworie UIO/G/DNL
DRB: Decision Executive if applicable	SPONSOR: Tom Everitt UIO/G/DN
DRB: Members if applicable	ADM: Vincent Nwabueze UIO/G/DNL

Performance Parameters	Unit	<i>BPX-1</i>	GIP	Variance details
Total GIP Opex (Shell share)	USD Mln	NA	5.62	<i>Opex activity.</i>
FID Date	MMM/YY	NA	Q4 2016	
First Oil/Gas Date	MMM/YY	NA	Q1 2017	

Performance Parameters	Unit	<i>BPX-1</i>	GIP	Variance details
Proved Developed Reserves (GES ⁽¹⁾ @ RV-RT)	MMboe	NA	10.5	
Expectation Developed Reserves (GES or SWIS ⁽²⁾)	MMboe	NA	16.5	
UDC ⁽³⁾ (MOD)	USD/boe	NA	2.32	Opex used
Oil - Initial Rate (100%) ⁽⁴⁾ Gas - Capacity (100%) ⁽⁴⁾	b/d – Oil MMscf/d- Gas	NA	NA 40	Gas Nomination @ 27/12/2012

NOTES: Conversion of gas volumes to boe: use SIEP standard conversion of 1 Bcf = 0.1724 MMboe

⁽¹⁾ GES: Group Entitlement Share

⁽²⁾ In PSC environment quote SWIS.

⁽³⁾ UDC: SS Project Capex/GES Developed Expectation Reserves (or SWIS in PSC environment)

⁽⁴⁾ Initial stable oil flow or first 3 months average production rate.

Major Milestones

Not Applicable