Group Investment Proposal

GIP Lite for proposals **< USD 20 mln** Shell share, aligned with the Business Unit Manual of Authorities

Business unit	Onshore /Shallow Water Projects		
Shareholders / partners	100% SPDC, whereas SPDC is the Joint Venture (JV) operator of an unincorporated JV with a 30% interest		
Amount (Shell share) MOD, 50/50	**USD 3.24 Mln** Shell share, MOD, 50/50 to cover the execution costs in 2016.		
Project	***OGGS to ELPS Gas Diversion Project***		
	NPV7 (USD mln)	RTEP (%)	VIR
Base case	-0.10	NA	NA

Proposal Management Summary

This proposal seeks approval for OGGS to ELPS Gas Diversion project, which will enable the diversion of Bonga /EA gas currently flowing to NLNG to the domestic market. The Federal Government of Nigeria (FGN) and Shell agreed to divert Bonga gas currently exported to the Nigerian Liquefied Natural gas (NLNG) plant in Bonny to the Domestic market to mitigate shortfall in gas supply for power generation. To this end, the FGN appointed GigaGas Limited as sole processor of the diverted Bonga gas.

The plan is for the Bonga gas to be routed via the existing 24”x98km Off-shore pipeline from EA Riser Platform A to Forcados North Bank Facilities, from where it is expected to be diverted to the adjacent GigaGas facility for processing. The processed gas will be exported through the existing SPDC 16”x26km pipeline to Odidi from where it will tie-in to the proposed NPDC 24”x 5.5km pipeline to the Escravos Lagos Pipeline System (ELPS). Gigagas Ltd has since been undertaking engineering and installation works of the processing facility with SPDC’s support and they have advised end of Q2 2016 as on-stream date.

SPDC has reviewed GigaGas’s technical proposal and identified some modifications to be done within the FYIP facilities to ensure seamless integration and operations post-commencement of GigaGas Plant Operations. These modifications will safeguard FYIP Plant and other upstream JV assets (Bonga, EA, SSAGS) with over circa 300mmscfd intended for domestic gas supply.

The modifications entail additional scope to the FYIP Facilities as follows:

- Detailed Engineering Design of the tie-in Valve manifolds, Piping and other interfaces
- Procurement of associated Long Lead items (LLI) and Bulk materials
- Prefabrication and on-site installation activities

- Isolation and depressurization of 24"x98km EA RPA to Forcados Pipeline and 16" x 26km Forcados to Odidi export Pipeline currently under Nitrogen preservation to enable Tie-in.
- Re-pressurization of 24" & 16" pipeline with Nitrogen after tie-in of new installations
- Pre-commissioning and commissioning of the new installations in line with agreement

Total Shell share Capex is USD 3.24 mln (50/50, MOD

Capex (MOD)	Prior	2016	later
Commitment Phasing		10.8	
BP'15 Capex Phasing		10.8	

Value Proposition and Economics Summary

Value Proposition

This project value driver is to safeguard Shell's Licence to Operate (LTO) by demonstrating visible commitment to the Domestic gas market. This could be a factor in licence renewal, continued Government support for new oil and gas development and support for export gas development. On a separate track, it provides a platform to push for funding and other support to allow timely completion of the FYIP project since the equipment to be commissioned under the FYIP project will be used to handle gas coming from the OGGS and liquids returned from the proposed 3rd party processing plant.

Given that GigaGas was appointed unilaterally by the FGN to undertake the installation of gas processing facilities, Shell has no way of confirming the reliability of the facilities that will be installed by GigaGas. The risk therefore exists that the technical integrity of the equipment might not be up to standard which could result both in delays during start-up and spurious outages of the system during operations. To mitigate this risk, a back-pressure control and shutdown system skid is included as part of this proposal to ensure that in the event of any issues with the gas processors system, the gas molecules can be automatically re diverted to NLNG preventing a shutdown of the SPDC upstream facilities like FYIP, SSAGS, Bonga and EA.

There is therefore no direct economic return associated with the project save for the protection of Shell producing assets from Bonga, EA, FYIP, SSAGS, and other offshore asset in plan that aims to access the domestic market.

Summary Economics

The economics evaluation was carried out using a 50/50 level 1 cost estimate. The total MOD cost ($10.8mln) was treated as cost – only and the result shown in table 1. The impact of a 40% cost overrun sensitivity was also done as shown in the table

The EA Bonga Gas diversion full project value is shown in table 2. The evaluation is based on the current proposed commercial structure which assumes that unprocessed gas is sold to

Gigagas via a 5-year GSPA (instead of current sales to NLNG,) at the government advised gas price of $2.30/Mmbtu (revenues from the gas sale are escrowed pending resolution of AG terms on DW PSCs). This price has been assumed as MOD flat, and applied as the base case.

The upstream Shell Share NPV7 RT2016 for this alternative gas supply destination (base case) is $52.9mln, as shown in the table 2 below but the incremental value chain (upstream + midstream) SS NPV7 is a negative (-$62.2Mln) as shown in the same table.

Economics evaluation is based on Tax-Royalty fiscal assumptions.

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Table 1: OGGS to ELPS Gas Diversion (Cost Only), Shell Share

PV Reference Date: 1/7/2016	NPV (S/S $ mln)		VIR	RTEP	UTC (RT $/boe)		Payout-Time (RT)	Maximum Exposure (RT- AT)
Cash flow forward from: 1/1/2016	**0%**	**7%**	**7%**	**%**	**0%**	**7%**	**(yyyy)**	**$mln (yyyy)**
Base Case								
RV ($2.30/Mscf, RT 16)	-0.05	**-0.10**	**NA**	NA	NA	NA	NA	*NA*
Sensitivities (using RV)								
High Capex (+40%)		**-0.14**	**NA**				NA	*NA*

Table 2: OGGS to ELPS Gas Diversion (Full Project Scope), Shell Share

PV Reference Date : 1/7/2016	(S/S $ mln USD)	
Cashflow forward from: 01/01/2016	**0%**	**7%**
Base Case: Upstream Only (GSPA)		
RV ($2.30/Mmbtu , MOD)	**63.9**	**52.9**
Incremental Value Chain		
RV ($2.30/Mmbtu , MOD)	**-76.0**	**-62.2**

Economics Assumptions

- Gas Price:
  - Base: $2.30 /Mmbtu
- GHV of 1000BTU/Scf used.
- Gas was taxed under CITA with AGFA incentives.
- NDDC levy of 3% total expenditure.
- Education tax of 2% assessable profit.
- Abandonment cost is estimated at 10% of total project RT CAPEX.

Risks and Alternatives

The following specific risks have been identified for the project:

a. Delivering EA/Bonga gas through the RPA pipeline reduces the available ullage in the line for the production of SSAGS project. This has the potential to reduce FYIP production to about 80mmscfd from about 160MMscfd. SSAGS project team is currently evaluating possible options to mitigate this risk, including option of increasing discharge pressure.

b. The proposed 80barg export pressure of the GigaGas processing plant imposes a limitation of 185mmscfd (out of the ca 300mmscd expected from the integrated system) on the 16" Forcados to Odidi gas export pipeline. In order to un-lock the capacity of the export system, GigaGas has been engaged and will be required to install a compression system at their plant export (only for GigaGas's 175mmscfd capacity) post 2018 start-up of SSAGS. The compression is estimated at US$50mln (MOD) and under current understanding, the cost of installation will be borne by GigaGas. However, SPDC may however be compelled by FGN (similar to the discussion on the GigaGas liquid stabilization system) to reimburse GigaGas the cost of installing the compression system.

c. The pipeline section from EA riser to North Bank facility is currently under N2 preservation. There is a risk that the preservation may not be very effective, leading to possible delays in eventual commissioning of this work scope. To mitigate this, regular monitoring of the preservation medium is in place, in the form of taking pressure readings from the line.

d. The contractor organizational controls are different from SPDCs and therefore the risk exist that interface management and operational hand-off may be vague. To mitigate this risk, a tie-in and proximity agreement is being finalized to delineate the accountabilities and responsibilities of the various parties. Additionally, the Gas Sales and Transfer Agreement (GSTA) between SPDC and the processor will further delineate the roles, rights, responsibilities and obligations of the parties.

e. To fast track the scope, it is agreed to use existing SPDC contacts for the execution. There is a risk that contractor performance for the contracts with adequate contract value ceiling may not be to the desired level, resulting in delivery delays and/or quality issues. The PE responsible for this scope in FYIP team is currently evaluating this risk and seeking mitigation, including option of securing adjustment of contract ceiling value.

f. The project has already opened the discussion around the ownership of the Bonga gas under the PSC structure. If Government insists on ownership of the gas, the value derivable from the gas may be completely lost. The location of the 3rd party gas plant adjacent the FYIP plant enables the liquids to return to SPDC as currently done in NLNG.

Carbon Management

The proposal will not add appreciable amounts of flare gas hence Carbon Management effects have not been considered.

Corporate Structure and Governance

The project fits within existing SPDC Corporate structure and governance and the governance structure by the Group Opportunity Realization Standard.

Group and Business Standards

There are no significant accounting and/or reporting risks or opportunities associated with this proposal, however functional support for this proposal received from the OGGS to ELPS gas diversion DRB, Finance, Gas Commercial, Development, HSE and Project and Engineering.

Project Management, Monitoring and Review

The project will be managed, monitored and reviewed by the Shell FYIP project team in accordance with the standards project delivery and assurance processes. NAPIMS approval has been obtained for the activities and DPR approval will be obtained as part of the commissioning and start-up process.

Governance and oversight will be provided by the OGGS to ELPS gas diversion DRB in line with the ORS.

Budget Provision

The DRB approval to commence with the project was granted in November 2016 by which time the budget books for 2016 had already closed and therefore the scope was not included in OP15. However, the costs have been included in the 2016 Q1 LE and in the updated JV budget submission.

Group Financial Reporting Impact

No material finance reporting impact.

Disclosure

Disclosure, if required will be carried out in line with existing group and SPDC policies and procedures.

Financing

Shell share of the capital expenditure will be met by Shell Petroleum Development Company of Nigeria (SPDC). Expenditure related to this project will be accounted for in line with Group Policy.

Taxation

No extraordinary tax issues arise from this proposal.

Signatures

Supported by:	*Approved by:*
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Jan van Bunnik	David Martin
SPDC Finance Director	*GM Onshore Assets & Production Services*
Date ...../...../.....	