Group Investment Proposal

Summary information

Business unit and company	UIG, The Shell Nigeria Exploration & Production Company Ltd. (SNEPCo)
Group equity interest	100% SNEPCo 43.75% in Oil Mining License (OML) 133, operated by ESSO Exploration and Production Nigeria Ltd (EEPNL).
Other partners	Esso (56.25%) as Operator
Business or Function	Exploration & Production
Amount *All amounts are in Shell share, MOD and P50 unless otherwise stated*	2011 $US 16.9 mln 2012 $US 7.2 mln **This Proposal** **$US 24.1 mln** (***NOTE*** *– all economics presented are for the full Project Costs)*
Project	Erha Main Development (Oil Mining Lease 133)
Main commitments	$ 24.1 mln Capex for Identified Erha Main Improvement Project covering 2011-2012.

Projects	*Figures in USD$'000*		
	2011	**2012**	**Total**
Erha Security Upgrade	2,200	2,700	4,900
Turbine Capital Spares	5,100	800	5,900
Spare Water Injection Pump	900	200	1,100
Erha FPSO Free Fall Life Boats Replacement	1,400	400	1,800
HP Compressor Re-Statging	4,400	1,800	6,200
Provision of Alternate HC Gas Blanket	1,600	1,100	2,700
Mooring Rapid Response Program	1,300	200	1,500
Grand Total	**16,900**	**7,200**	**24,100**

Source and form of financing	Own resource financing.
Summary economics (Shell share)	Economics for the portion of the headline expenditure of **US$ 24.1 mln** (SS), for the Compressor Re-Staging provides an incremental value improvement of **US$ 19.4 mln** (SS) in the NPV7% (at US$60 RT/bbl) to the Erha Main FPSO through additional ultimate recovery and production acceleration. The Asset Integrity proportion of the expenditure, **US$ 17.9 mln** (SS), treated as an on cost, reduces the benefit of the additional ultimate recovery by **US$ 1.5 mln** (SS) NPV7% (at US$60 RT/bbl). *Input from Economics*

SUMMARY ECONOMICS	NPV ($Mln) Shell Share RT10			VIR	RTEP	Key Sensitivity (7%)	
						Capex +20%	
PSV	0%	7%	15%	7%		NPV	VIR
SV-RT $50/bbl	20.6	14.8	10.1	0.69	61%	14	0.56
RV-RT $60/bbl	24.6	17.9	12.5	0.83	71%	18	0.68
HV-RT $80/bbl	32.5	24.2	17.5	1.13	89%	24	0.92

Section 1: The Proposal (Management Summary)

Funding for Improvement Projects on the Erha FPSO has historically been captured within the Erha Main Project GIP updates, with latest update in June 2006. This separate Group Investment Proposal has been developed in order to both clearly distinguish these activities from the original scope of the Erha Main Project, for potential cost recovery reasons, in addition to providing a sustainable and transparent mechanism for funding, tracking and controlling future "minor" CAPEX Improvement Projects. These Minor Improvement projects typically address one or more of the following: technical integrity; securing or improving production; operability enhancements and finally safety and environment.

The current proposal of **US$ 24.1 mln** will address the following:

- Erha FPSO Security Upgrade Project Phase 2
- Provision of Turbine Capital Spares
- Spare water Injection Pump
- Erha FPSO Free Fall Life Boats (FFLB) Replacement
- HP Compressor Re-Staging
- Provision Of Alternate HC Gas Blanket
- Mooring Rapid Response Program

[Appendix 1 provides addition details of the identified Improvement Projects]

Although, this proposal covers mainly the presently identified Erha improvement projects, expectation is that this proposal will be revised periodically in the future to cover similar minor modifications as they are identified and progressed through the maturation funnel.

Section 2: Value proposition and strategic and financial context

This proposal is consistent with BP10. The proposed work program will protect the integrity of the Erha Asset, improves the availability of the facilities and the safety of the Erha FPSO.

This supports Shell's OML 133 strategy to keep the Erha FPSO producing safely and reliably.

Summary Economics

The Key assumptions used in the economics are as follows:

- A Capex (i.e Asset Reliability Cost) of $ 24.1 mln MOD (SS) is required for Erha to deliver the production forecast as stated in the Business Plan.
- Evaluations based on the existing 1993 PSC Agreements.
- Forward-looking Economics presented showing the incremental impact on Erha Main cashflows.
- No value is assigned to associated gas because there are no gas terms in the 1993 PSC Agreements.
- The Sensitivity is on a possible 20% Capex over run.

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Section 3: Risks and Alternatives

Principal risks and mitigation associated with the work covered by this proposal are as follows:

Risk	Planned Mitigation
NNPC & DPR Approval Delays Delays in the required statutory approvals by NNPC and DPR will impact the project delivery and costs.	The Operator, Esso, has dedicated resources in Lagos with the focus to facilitate dialogue and secure timely NNPC & DPR support/approvals.
NNPC disputes the Contractor Group's view of the PSC terms regarding application of Investment Tax Credit (ITC), tax deductibility of non-cost recoverable expenses and royalty oil calculation.	Arbitration has been initiated in 2009 to resolve said issues.
Petroleum Industry Bill (PIB). A bill has been submitted to the National Assembly restructuring the petroleum legislation and the NNPC. Implications to deepwater projects are unclear – however initial evaluation indicates a high potential impact on project economics.	Industry efforts are coordinated through OPTS with dedicated SNEPCo/SPDC resources supporting it.
Cost Recovery Exposure. NAPIMS Support and approval of proposed budget. As well as NAPIMS/NNPC Approval of Related Contracts.	The 2010 budget proposal for Erha Main improvement projects has been supported at NAPIMS sub-committee levels in 2010. Operator plans include NNPC/NAPIMS approval of all related contracts.

Alternatives considered:

There are no viable alternatives to proceeding with the identified improvement projects. A decision by SNEPCo not to support Esso's recommendation to progress would be in contravention of existing JV agreements, which require Coventurers to fund their share of the agreed work program and budget. Non-support could potentially lead to sole risk by Esso with severe financial and reputational consequences. Furthermore, SNEPCo is convinced that these projects are necessary for the continued generation of value from the Erha Asset

Section 4: Corporate Structure, and Governance

SNEPCo is a 100% Group company with ownership vested in SPNV (NL). Governance is in line with the new UI SSA Operating model.

Section 5: Functional Support and consistency with Group and Business Standards

The scope of work covered by this proposal is consistent with Group HSE, ER and Sustainable Development policies. Functional Support from Finance, Tax, Treasury, HSE/SD, and Legal has been obtained.

Section 6: Project management, monitoring and review

Project assurance is executed in accordance with the requirements of ORG, EP-05 (Govern Non-Operated Ventures), SEPCIN NOV Governance Guide and by fully leveraging the

deepwater development expertise of the UIG Deep Water Projects (DWP) as well as the Shell Projects and Technology Groups.

Section 7: Budget provision

The P50 funds requested in this GIP are within SNEPCo's BP10 requested budget ceiling for Erha Main.

Section 8: Group financial reporting impact

The Financial impact of the proposal is summarised below.

US$ mln, Shell share, MOD, 50/50 Base Case at RV-RT $60	2011	2012	2013	2014	2015	2016
Commitment phasing (un-geared Shell share) *	12.9	5.6				
Profit & Loss: NIBIAT Gain / (Loss)	(0.38)	(0.16)				
Balance Sheet (Average Capital Employed)	5.46	14.06	17.56	17.9	17.9	17.9
Cash flow						
Capital Expenditure	12.5	5.4				
Cash Flow: Cash from Operations	1.21	(1.07)	(0.69)	(0)	(0)	(0)
Cash Surplus / (Deficit)	(11.29)	(6.47)	(0.69)	(0)	(0)	(0)

*) Commitment phasing (un-geared Shell Share) is equal to 55% of the total estimated spend over the respective years.

Section 9: Disclosure

Disclosures, if required, will be in line with existing Group and SNEPCo policies and guidelines.

Section 10: Financing

The project will be funded by SNEPCo's own generation of funds from existing production revenues, at a cost not exceeding US$ 24.1 mln (Shell Share).

Section 11: Taxation

There are no unusual Taxation features.

Section 12: Key Parameters

The following are the main aspects of this proposal:

- CAPEX of $24.1 mln for improvement of Erha Main facilities to ensure operational excellence and to meet the production forecast.

Section 13: Signatures

This Proposal is submitted to Executive Vice President, Upstream International Sub-Saharan Africa for approval.

Supported by::

For Business approval:

Bernard Bos,
Vice-President Finance, SSA
Date:

Ian Craig,
Executive Vice President, SSA
Date:

Originator: Olaposi Fadahunsi SNEPCo-EPG-TO

List of Attachments:

Appendix 1: Details of Erha Minor Improvement Projects

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Project Description /Scope
Erha Security Upgrade Project Phase 2 ($US 4.9 mln Shell Share) *Background:* • 2nd Phase of FPSO Security Upgrade based on Bonga Security Incident review Recommendations *Justification:* • Increase Facilities and personnel security on FPSO *Scope of Work:* • FPSO Safe Room Upgrade (work scope covers plating the 2 entry/exit doors to make them UL Level 8 compliant) • Upgrade of boat landing to deter and delay unauthorized entry • Install ring of security lighting along FPSO looking outwards. • Install Monitoring (security cameras) outside safe havens and motion detectors at starboard & port stairwell of FPSO • Convert Control room into a 2nd safe haven • Install Small Target Radar/Vessel Tracking/Instant Distress Signaling on FPSO
Provision of Turbine Spares – LM 250+ & High Speed Power Turbine ($US 6 mln Shell Share) *Justification:* • Provision of critical spares to mitigate against impact of unplanned failure o Presently Erha FPSO has only one spare LM2500+ and PT for 5 units: HP1 & HP2 compressors and TG1, TG2 & TG3 generators o These spares are to be used in scheduled change-out HP2 gas turbine o Time to overhaul engine removed from HP2 is approx. 12 months o Consequence of LM2500+ failure with no spare = 50KBD production for up to 12 months *Scope of Work:* • Procurement and Delivery of one LM 2500+ • Procurement and Delivery of one PGT25+ Power Turbine • Procurement and Delivery of one LM 2500+ Auxiliary Gearbox
Provision of Spare Water Injection Pump ($US 1.1 mln Shell Share) *Justification:* • Provision of critical spares to mitigate against impact of unplanned failure o Presently Erha FPSO has three installed pumps that operate 100% all the time with no installed spare and no warehouse spare o Time to replace or repair pump in the case of a failure is about 12 months o Consequence of a single pump failure is approximately = 7KBD till repair or replacement. o Spare pump will also be used for pumps overhaul program to commence in 2012 *Scope of Work:* • Procurement and Delivery of one Spare Water Injection Pump

Erha FPSO Free fall Life Boats (FFLB) Replacement ($US 1.8 mln Shell Share)

Background:

- Lessons from a Statoil lifeboat test launch in 2005 found excessive canopy deflection and structural damage
- This incident prompted a study (by OLF**1)** between 2005-2007 which concluded "insufficient original design criteria" and recommended new industry design requirements (1.3SF Vs 2.1SF)
- ExxonMobil evaluated Kizomba conditions (***similar conditions as Erha***) and concluded that launch from >20m could result in excessive canopy and as such "actual lifeboat has not sufficient strength & stiffness for actual loading conditions".
- Replacement with a compliant new designed model is more cost effective than reinforcement of existing boats**.**

Justification:

- HSE: Mitigate Potential personnel head injury (Unmitigated High Risk Rating – Exxon Risk Assessment)

Scope of Work:

- Procurement and Delivery of 3 Free Fall Life Boats (FFLB)
- Installation of Free Fall Life Boats

HP Compressors Restaging ($US 6.2 mln Shell Share)

Justification:

- Re-Staging of Existing HP Compressors to:
  - Increase injection Capacity by 8%
  - Increase FPSO Gas Handling Capacity by 30MMscfd
  - Increase FPSO Production by 4Kbod
- Additional 2.8 MBO EUR

Scope of Work:

- Procurement, Delivery and installation of new rotor's, bundle, seals, bearings etc.

Provision of Alternative Hydrocarbon (HC) Gas Blanket ($US 2.7 mln Shell Share)

Background:

- Inert gas generators (IGGs) burner heads developed cracks, leading to leakage of cooling water
  - Water spray on the cone results in premature failure of cones and frequent replacement
- Cracks had also been observed and repaired at various nozzles on the jacket
- RCFA indicated that long-term reliability of existing IGGs is low
- RCFA recommendations included use of hydrocarbon gas for blanketing storage tanks during offloads and use existing 2x100% IGG units for tank inerting prior to entry and backup to the HC gas supply

Justification:

- Provide reliable source of inert gas required during tank filling
- Mitigate potential financial loss due to demurrage and unscheduled downtime associated with tank top management
- Eliminate cost associated with frequent replacement of IGG burner heads and Cones

Scope of Work:

- Phase 1 (2010): Procure and install piping to route HC gas piping from LP suction scrubber to the inert gas header
- Phase 2 (2011-2012): Procure and Install a Vapor Recovery Unit to recover vented HC vapor during tank filling.

Mooring Rapid Response Program ($US 1.5 mln Shell Share)

Background/Objective:

- To provide information to identify a mooring line failure and determine short and long term response to this failure.

Justification:

- To enhance the safety of the operation during the line failed scenario
  - Expected facility movement and motion envelopes
  - Decision tools to ensure production systems are within safe operational windows
- Document response plans in advance to mitigate the consequences of a line failure from any cause
- Quickly repair or reduce the time to replace a failed mooring line
  - Disruption to production is minimised
  - Better manage the risk of operations with a line failed

Scope of Work:

- Develop generalized response procedures for potential line failure scenarios
- Develop a shut in philosophy and ensure key stake-holders understand the underlying basis and assumptions
- Procure and install Line Failure detection hardware
- Procure and store adequate spare mooring hardware to cover all three failure scenarios identified in RA
- Procure services of specialized installation vessel and required logistics.