2013 NIGERIAN MARGINAL FIELD DEVELOPMENT WORKSHOP

SOCIETY OF PETROLEUM ENGINEERS 37TH NIGERIAN ANNUAL INTERNATIONAL CONFERENCE & EXHIBITION (NAICE 2013)

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MARGINAL FIELD DEVELOPMENT: BEST PRACTICES & LESSONS LEARNED

FACILITIES EVALUATION & OPERATIONS ASPECTS OF MARGINAL FIELD DEVELOPMENT – ENERGI A CASE

Engr. Felix A.V (MD/CEO)
Outline of Presentation

• Introduction
• In the Beginning
• The Journey So far
• Facilities-Evaluation & Operations
  • Process Facilities
  • Metering Facilities
  • Pipelines
  • Storage Facilities
  • Challenges
  • Mitigations
• Conclusion
ENERGIA PROFILE

INTRODUCTION

✓ Incorporated in 2001 by Key Oil & Gas Technology/Services providers.

✓ Wholly owned Nigeria Company

✓ 100% Nigerian Board of Directors, Management Team & Staff.

✓ No Foreign Technical or Financial Partner.

✓ Head Office in Lagos with Base Office in Kwale, Delta State
CORPORATE SERVICE/TECHNOLOGY PROVIDERS
Ebendo (ex-Obodugwa) - Obodeti was one of 24 Marginal Fields awarded in 2003.

Energia is designated Operator with 55% Equity; OPDC has 45%.

Field is located in Onshore Delta State, in OML 56, originally operated by TOTAL.
# 2003 Marginal Fields

<table>
<thead>
<tr>
<th>S/N</th>
<th>Field</th>
<th>Farmor</th>
<th>OML</th>
<th>Farmee</th>
<th>Terrain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Asuokpu/Umutu</td>
<td>Shell</td>
<td>38</td>
<td>Platform (100%)</td>
<td>Land</td>
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<tr>
<td>2</td>
<td>Asaramatoru</td>
<td>Shell</td>
<td>11</td>
<td>Prime Energy (51%) / Suffolk Petroleum (49%)</td>
<td>Swamp</td>
</tr>
<tr>
<td>3</td>
<td>Atala</td>
<td>Shell</td>
<td>46</td>
<td>Bayelsa Oil (100%)</td>
<td>Swamp</td>
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<tr>
<td>4</td>
<td>Eremor</td>
<td>Shell</td>
<td>46</td>
<td>Excel E&amp;P (100%)</td>
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</tr>
<tr>
<td>5</td>
<td>Ibigwe</td>
<td>Shell</td>
<td>16</td>
<td>Walter Smith (70%) / Morris Petroleum (30%)</td>
<td>Land</td>
</tr>
<tr>
<td>6</td>
<td>Ofa</td>
<td>Shell</td>
<td>30</td>
<td>Independent (100%)</td>
<td>Land</td>
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<tr>
<td>7</td>
<td>Oza</td>
<td>Shell</td>
<td>11</td>
<td>Millenium Oil (100%)</td>
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<tr>
<td>8</td>
<td>Qua Ibo</td>
<td>Shell</td>
<td>13</td>
<td>Network Oil &amp; Gas (100%)</td>
<td>Land</td>
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<tr>
<td>9</td>
<td>Stubb Creek</td>
<td>Shell</td>
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<td>Universal Energy (100%)</td>
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<tr>
<td>10</td>
<td>Tom Shot Bank</td>
<td>Shell</td>
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<td>Associated (51%) / Dansaki Pet (49%)</td>
<td>Offshore</td>
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<tr>
<td>11</td>
<td>Tsekelewu</td>
<td>Shell</td>
<td>40</td>
<td>Sahara (51%) &amp; AOG (49%)</td>
<td>Swamp</td>
</tr>
<tr>
<td>12</td>
<td>Uquo</td>
<td>Shell</td>
<td>13</td>
<td>Frontier Oil (100%)</td>
<td>Swamp</td>
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</thead>
<tbody>
<tr>
<td>13</td>
<td>Ororo</td>
<td>Chevron</td>
<td>95</td>
<td>Guarantee Oil (55%) / Owena Oil (45%)</td>
<td>Offshore</td>
</tr>
<tr>
<td>14</td>
<td>Akepo</td>
<td>Chevron</td>
<td>90</td>
<td>Sogenal (100%)</td>
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<td>15</td>
<td>Ogedeh</td>
<td>Chevron</td>
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<td>Bicta (100%)</td>
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<td>16</td>
<td>Ajapa</td>
<td>Chevron</td>
<td>90</td>
<td>Britania –U (100%)</td>
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<td>17</td>
<td>Dawes Island</td>
<td>Chevron</td>
<td>54</td>
<td>Eurafic (100%)</td>
<td>Swamp</td>
</tr>
<tr>
<td>18</td>
<td>KE</td>
<td>Chevron</td>
<td>54</td>
<td>Del-Sigma (100%)</td>
<td>Swamp</td>
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<tr>
<td>19</td>
<td>Oriri</td>
<td>Chevron</td>
<td>88</td>
<td>Goland (100%)</td>
<td>Offshore</td>
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<tr>
<td>20</td>
<td>Ekeh</td>
<td>Chevron</td>
<td>88</td>
<td>Movid (100%)</td>
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</tr>
<tr>
<td>21</td>
<td>Umusadege</td>
<td>Elf</td>
<td>56</td>
<td>Midwestern Oil &amp; Gas (70%) / Suntrust (30%)</td>
<td>Land</td>
</tr>
<tr>
<td>22</td>
<td>Obodugwa / Obodeti</td>
<td>Elf</td>
<td>56</td>
<td>Pillar Oil (100%)</td>
<td>Land</td>
</tr>
<tr>
<td>23</td>
<td>Umusati/Igbuku</td>
<td>Elf</td>
<td>56</td>
<td>Energia (55%) / Oando (45%)</td>
<td>Land</td>
</tr>
<tr>
<td>24</td>
<td>Amoji/Matsogo/Igbolo</td>
<td>Elf</td>
<td>56</td>
<td>Chorus (100%)</td>
<td>Land</td>
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</table>
OTHER MARGINAL FIELDS AWARDS

- Okwok and Ebok fields to Oriental Energy.
- Ogbelle field was awarded to the Niger Delta Development
- In 2010, Otakikpo to Green Energy Ltd
- Ubima fields to Allgrace Energy Ltd.

CLUSTER FIELDS ARRANGEMENT IN KWALE
Inherited four wells: Obodeti Well - 1. Ebendo (ex-Obodugwa) -1 and 2 and Obodugwa-3 which is located in Pillar Oil Concession.


2. Ebendo -1: Drilled in 1980. Found 6 Hydrocarbon Sands. The well was completed on Level XIX but was abandoned by Elf due to Fish in Hole.

FIELD RESERVES AND BASIC INFORMATION

**BASIC INFORMATION & FIELD RESERVES**

- Inherited 6 mmbbls P1 reserves for Ebendo Field, and less than 1 mmbbls for Obodeti field.

- Inherited 106sq kms of 3D Seismic data of 1991-vintage with an 11 km² data gap with Ebendo - 2 located at the center of the gap.

The eastern and western culmination are separated by a saddle.
FIELD DEVELOPMENT CHALLENGES

- Resolved Protracted Host/Impacted Communities challenges through Global MOU.

- Difficult, and protracted Rigless workover to resuscitate Ebendo (ex-Obodugwa) well-1.

- Paucity of data for review and field evaluations.

- Difficulty in raising Capital from banks.
FIELD DEVELOPMENT MODEL

- MOU created Trust Fund for sustainable development through crude proceeds.
- 100% Foundational Service/Technology Providers.
- Initial JV Cashcalls.
- Third Party Service Providers goodwill.
- Collaboration/Support from other Kwale Cluster Marginal Field Operators.
- Cost Oil Funding from Crude Proceeds from Trucking.
Cluster Group Collaboration in Field Development

- Cluster Group in Kwale: Energia, MWOG, Pillar, Platform, and Chorus Oil.

- Joint Crude Handling Agreement (CHA) with NAOC to transport Commingled Crude to Brass Terminal for Sales

- Constructed a common Injection Hub at Umusadege with individual LACT units and common monitoring system.

- Commingles Cluster Crude at the Injection Hub to Brass terminal for export.
2010 CRUDE TRUCKING
TEMPORARY INJECTION SYSTEM
FIELD DEVELOPMENT STRIDES

- Installed a temporary injection facility at MWOG facility to evacuate test oil.
- Converted the EPF to full blown flow station in 2009.
- Engaged Road Tankers and Trucked crude for eight months with DPR permit.
- Generated funds to construct 8.5 km x 6” export line to Injection Hub at Umusadege.
- Installed a permanent Leased Automatic Custody Transfer (LACT) unit for crude metering and fiscalization.
- Installing 2 x 10,000 bbls crude tanks
THANK YOU