CAPABILITY DOCUMENT

Sustainability through continuous innovation

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Asset Integrity Gap Assessment

Location
Nigeria – OML-29
Nembe

Water depth
Swamp and land

Systems
Structural, lifting, housings
Process equipment
Safety systems
Electrical and control

Pipelines
- 11 gas pipelines (1 not operational)
- 9 oil delivery lines (1 abandoned, 1 not-operational, 1 disused)
- 6 oil trunk lines (3 disused pipelines)

Wells & Xmas Trees
- 153 wells drilled
- Asset design capacity of 240,000 bopd
- Asset production @2013 was 64,112 bopd
- Operating at only 27% of design capacity

Activities
Integrity Management

Duration
2018 - 2019

Anomaly register creation

Detailed Integrity Review and Audit Report
- Summary of IM policy and expectations and deficiencies
- Summary of asset performance measurement
- Current practices and recommendation updates
- Incident management process review
- Emergency repair systems summary
- Asset component list
- Site visit survey reports
- Gap assessment
- KP4 integrity concerns and recommendations
- System overview – fitness for service
- Statement of integrity – Santa Barbara concrete barge
- Integrity workshop session

Creation of Asset Database
- Wellheads & xmas trees
- Pipelines & valves
- Structures and lifting
- Manifolds and swamp equipment
- Flow and pump stations

Site Inspection - General Visual Inspection
- High Level HAZID & presentation
- Communications and Bridging Document
- Inspection work-packs for
  o Nembe 1, 2, 3 & 4
  o Santa Barbara
  o Odeama
  o Nembe 1, 2, 3 Oil Manifold

Site Daily Progress Reports
Site Inspection Report for Each Asset
TECHNICAL CAPABILITY STATEMENT

Pig Refurbishment Services – North Sea Operations

Location
United Kingdom

Water depth
n/a

Activities
Pig design
ILI tool cleaning
Cleaning pigs
management
Pig damage review

Duration
2016 - on-going

Pig platform prior to cleaning

Inspection planning and feasibility studies; procedure review;
HAZID/HAZOP; contractor liaison; project management and
on-site supervision.

Tools
- Varying pigging and gauging tools

Pigging support contract, several projects for
managing their pigs before and after use by
operators.

Waste management - cleaning program pigging slug

Scope of work
- Pig cleaning
- Pig wax disposal
- Pig storage and transportation
- Pig refurbishment

Discharge management – ensuring all wastes
and contaminants are effectively contained
A structured, auditable and low-cost approach …

**TECHNICAL CAPABILITY STATEMENT**

**PL80000 6-inch x 26.7 km Gas Condensate Pipeline 2017 ILI**

**Location**
England

**Water depth**
n/a

**Activities**
Pig design
ILI tools selection
Pumping spread
Temporary facilities
Temporary valves
Pig damage review

**Duration**
2016 - 2018

Pigging support contract, several projects for Perenca from cleaning, through to inspection of their pipelines.

Set up of intelligent pigging units

Inspection planning and feasibility studies; procedure review:
HAZID/HAZOP; contractor liaison; project management and on-site supervision.

**Tools**
- Varying pigging and gauging tools
- Temporary pig launch and receipt facilities

Development of bespoke pigging procedures

**Scope of work**
- Development of pigging procedure
- Cleaning
- Gauging
- Inspection
- All necessary pipeline modification to perform work
- Pig tracking
- Permitting, approvals and assistance to the Owner as required as described
- Monitoring and recording
- Pig damage assessment

Brush Pig used for operation
## TECHNICAL CAPABILITY STATEMENT

### Addax Pipeline Inspection 6" and 12"

<table>
<thead>
<tr>
<th>Location</th>
<th>Owerri, Nigeria</th>
</tr>
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<tbody>
<tr>
<td>Water depth</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td></td>
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<tr>
<td>Pig design</td>
<td></td>
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<tr>
<td>ILI tools selection</td>
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<tr>
<td>Pumping spread</td>
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<tr>
<td>support</td>
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<td>Temporary facilities</td>
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<td>Temporary valves</td>
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<tr>
<td>Pig damage review</td>
<td></td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>2018</td>
</tr>
</tbody>
</table>

- Pigging support contract, for the commissioning of the 6 and 12" oil pipelines

### Development of bespoke pigging procedures

- Set up of intelligent pigging units
- Inspection planning and feasibility studies; procedure review;
  HAZID/HAZOP; contractor liaison; project management and on-site supervision.

### Tools
- Varying pigging and gauging tools
- Temporary pig launch and receipt facilities

### Scope of work
- Development of pigging procedure
- Cleaning
- Gauging
- Inspection
- All necessary pipeline modification to perform work
- Pig tracking
- Permitting, approvals and assistance to the Owner as required as described
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## TRACK RECORD

### Engineering and Integrity
- **2018 | ongoing | Deepblue Energy Services Limited | Engineering and PSupport**
  - 2018 | Aiteo | OML 29 Asset Integrity
  - 2018 | Addax Petroleum | x2 Pipeline Baseline Inspection

### Pipeline Inspection and Cleaning
- **2018 | Addax Petroleum | x2 Pipeline Baseline Inspection**
  - 2017 | Perenco UK | PL80000 6 inch x 26.7 km Gas Condensate Pipeline Support
  - 2017 | Perenco UK | PL80000 6 inch x 26.7 km Gas Condensate Pipeline Procedure Support
  - 2017 | Rosen UK | Service Agreement Pigs Support and Cleaning Service

### Pigging Services
- **2019 | CNR International | Pipeline Pig Cleaning & Refurbishment Service**
  - 2018 | Addax Petroleum | x2 Pipeline Baseline Inspection
  - 2017 | Rosen UK | Service Agreement Pigs Support and Cleaning Service