Aker Drilling Riser Brazil

Presenter
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Aker Solutions Rio das Ostras

General Offices
Meeting room
Restaurant

Aker Riser workshop
Aker Subsea workshop
Aker MH workshop
Aker MH office & training centre
Aker Drilling Riser Brazil

Risers **First Line** for production, tests, services and after market for drilling risers in Brazil with dedicated people for manufacturing, purchasing, quality, engineering and offshore

<table>
<thead>
<tr>
<th>Man Power</th>
<th>65 employees</th>
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<tr>
<th>Area</th>
<th>Total</th>
<th>42000 m²</th>
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<tbody>
<tr>
<td>Workshops</td>
<td>10000 m²</td>
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<tr>
<td>Offices</td>
<td>3500 m²</td>
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<tr>
<td>Open area</td>
<td>28000 m²</td>
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<th>Investment</th>
<th>R$ 26 millions</th>
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Aker Drilling Riser Brazil - Delivered Projects

■ Olinda Star

- water depths up to 1,100 meters.
- 78 riser joints with 50 ft. + 5 pup joints
- Riser joint configuration: Main Pipe - 21" OD x 0.625" wall, with 2 choke and kill lines, 5" OD x 3.75" ID and 1 mud booster line, 5" OD x 4" ID.

■ Lone Star

- water depths up to 2,400 meters.
- 111 riser joints with 75 ft. + 5 pup joints
- Riser joint configuration: Main Pipe - 21" OD x 0.750" to 1" wall, with 2 choke and kill lines, 6.5" OD x 4.5" ID, 1 mud booster line, 5" OD x 4" ID and 2 hydraulic lines 3.5" OD x 3" ID.
Aker Drilling Riser Brazil - Ongoing Projects

■ Gold Star

- water depths up to 2,000 meters.
- 93 riser joints with 75 ft. + 5 pup joints
- Riser joint configuration: Main Pipe - 21" OD x 0.8125" to 1" wall, with 2 choke and kill lines, 6.5" OD x 4.5" ID, 1 mud booster line, 5" OD x 4" ID and 2 hydraulic lines 3.5" OD x 3" ID.

■ Alpha Star

- water depths up to 2,700 meters.
- 123 riser joints with 75 ft. + 5 pup joints
- Riser joint configuration: Main Pipe - 21" OD x 0.8125" to 1" wall, with 2 choke and kill lines, 6.5" OD x 4.5" ID, 1 mud booster line, 5" OD x 4" ID and 2 hydraulic lines 3.5" OD x 3" ID.
Developments Implemented in Brazil

➢ Local Suppliers
  ● Pins
  ● P-lines connectors
  ● Clip Connectors Machining
  ● Clamps, Guide-plate, Guide Plate Support
  ● Seals
  ● Bolts and Nuts

➢ Welding Procedures

➢ Manufacturing Procedures

➢ 50% Local Content
Layout Riser Building

BEVELLING
WELDING
HEAT TREATMENT
NDT INSPECTION
BLASTING
PAINTING
BEVELLING, WELDING & HEAT TREATMENT AREA

Aker Solutions
Manufacturing Phases

Cutting
Bevelling
Pre Heating
Welding
NDT- Dimensional
NDT - Ultrasonic
NDT - Hardness
NDT–Magnetic Particles
Heat Treatment
Pressure Test
Painting
Assembly
Riser joints with buoyancy modules and fins. Buoyancy for uplift, reduces the weight of the joint in water. Fins attached for protection of P-lines during tripping. Stacking Rings for allowing horizontal storage.
Clip Riser General Characteristics

- Most Secure Connection: Fully Opened or Closed Positions Only
- No Threading, Bolting, or Preloading
- Easy Stabbing even with Misalignment
- Minimum Maintenance
- Very Quick Connections
CLIP Connector Assembly

- **Description**
  - Composed of 3 forged elements
  - Locking on 360° by two rows of dogs
  - No pre-stress required to achieve full capacity

- **Main Advantages**
  - Fast make-up/break-out
  - Robust
  - Safe & Reliable operation
Locking the CLIP Connectors – In less than 11 seconds!
CLIP Connector Assembly

Description
- Connector is a “breach lock” type
- Composed of 3 forged elements
- Locking on 360° by two rows of dogs
- No pre-stress required to achieve full capacity

Main Advantages
- Fast make-up/break-out
- Robust
- Safe & Reliable operation
CLIP Riser Make-up

INDEXING PIN

CONNECTOR SHOWN LOCKED IN LOWER ALIGNMENT BLOCK

CONNECTOR SHOWN UNLOCKED IN UPPER ALIGNMENT BLOCK
CLIP Riser 11 Second Make Up
Running CLIP Riser
Make up Tools

CLIP Breechlock

Make-up tool (steel bar)

Flanged Riser

Hydraulic Torque wrench
Peripheral Lines

- Peripheral Lines are fitted with Replaceable Subs

- Subs can be replaced in the field with no need of welding

Choke & Kill Line
4 1/2” ID
x
15,000 PSI W.P.

Boost Line
4” ID
x
5,000 psi W.P.

Hydraulic Line
2 each
1.875” ID
x
5,000 psi W.P.
Peripheral Lines

- Peripheral Lines are fitted with Replaceable Pins

- Pins can be replaced in the field with no need of welding
Replaceable Peripheral Lines
Field Replaceable Peripheral Line Saver Subs

- Choke & Kill
- Hydraulic
- Boost
CLIP Riser Hydraulic Running Tool

Picks up and delivers Riser joints from/to vertical set-back in-chute. Allows also for horizontal pick-up from trolley.
Riser Hydraulic Running Tool – Ready for Riser handling
CLIP Riser Hydraulic Running Tool
Landing CLIP Riser In Spider
CLIP Riser Stored Vertically
CLIP Riser Bay Handling tool – Single pick-up capacity
Vertical Handling of the CLIP Riser
CLIP Riser Test Tool
CLIP Riser Spider, Gimbal and Load Plate
Spider and Gimbal
Spider with Rams Extended
Spider & Gimbal Assembly
CLIP Riser Landed in Spider
CLIP Riser Telescopic Joint
Clip Riser Telescopic joint
Clip Riser Telescopic joint (Goose necks)
Clip Riser Tension Ring
Clip Riser Termination Adapter
Clip Riser Fill-up valve
The End – Thank you very much for your attention
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