The New Generation:
ENSCO DS-9 and ENSCO DS-10 Ultra-Deepwater Drillship
The New Generation of Drillships

ENSCO DS-9 and ENSCO DS-10, new generation drillships, offers significant advantages over other vessels and equals or exceeds the highest specification drillships under construction or in service to date.

Primary features:

- Outfitted for drilling in water depths up to 10,000 ft (upgradable to 12,000 ft) with total drilling depth of over 40,000 ft
- Equipped with dynamic positioning in compliance with DPS-3 certification
- Dual derrick with enhanced and redundant offline tubular stand building features
- 2.5 million pound main hoist and 2 million pound auxiliary hoist
- Active heave compensated drawworks mounted at the drill floor level are more precise for controlling weight during critical operations
- A 165 ton active heave compensating construction crane allowing for deployment of subsea production equipment without interfering with ongoing drilling operations
- Six 5.5 megawatt retractable thrusters for exceptional station-keeping performance, reserve power and fuel efficiency on rig moves

- Four x 2,200 HP mud pumps (with space for two additional)
- Derrick set-back capacity is increased to allow for larger strings of casing while simultaneously racking standard drill pipe and landing string
- Space for two BOP stacks – outfitted with two BOPs with seven rams at 15,000 psi and two annulars at 10,000 psi; BOP is configured with two sets of blind shear rams, casing shear ram, acoustic back-up system, auto shear, deadman and multifunction EDS, meeting all existing and projected future regulations
- Living quarters for up to 200 personnel

Based on the Samsung GF 12000 or “Green Future” design, the new drillship’s optimized hull form provides higher deck load capacity and better vessel roll motions. It also reduces fuel consumption by 10% while providing customers with more deck space than previous Samsung designs.

ENSCO DS-9 and ENSCO DS-10 will be the seventh and eighth Samsung DP3 drillships in the Ensco fleet and is in keeping with our strategy of standardization, which streamlines construction, operations, inventory management, training, regulatory compliance, repairs and maintenance.
FIELD DEVELOPMENT FRIENDLY

— Triple Fluids System (oil-based mud, water-based mud, brine)
  • Active and reserve pits can be operated as one large system or split into oil-based mud side and water-based mud and brine side
  • Pits and pumps are configured for double valve isolation for positive segregation
  • Independent brine return piping from diverter and separate brine shale shaker
  • Four mix and transfer pumps provide redundancy and retain capability when split
  • Three mixing hoppers (barite, bentonite, sack and big bag) with three separate feeds and returns
  • Brine filtration supply and return piping provided, set up for maximum flexibility
  • Offline processing – mud over dedicated shale shaker, brine over a separate dedicated shaker

— Shale shakers can be upgraded to triple deck for LCM recovery/stress cage drilling
— Well Testing – expanded area and burner boom provided
— Mousehole by auxiliary rotary with dropped object prevention shock absorber can withstand a quad stand of 9 1/2 in. drill collars dropped from floor level
— Frac hose hangers provided on both sides of vessel

SUBSEA CONSTRUCTION READY

— Space and utilities are provided for two heavy-duty ROV spreads
  • Sized for largest 250 hp work class systems
  • Hull mounted cursor rails for launching ROVs in high currents

— 165-ton Active Heave Compensated Subsea Construction Crane
  • Capable of running 100 mt to 10,000 ft water depth
  • Can handle items too large or awkward for running through the moonpool, e.g., jumpers, manifold, flying leads, pipeline/flowline pull-ins, etc.
  • Allows subsea construction to happen off the critical path
  • Self-contained field development capability allows for the hundreds of small lifts needed to commission equipment without another vessel and has the potential for major cost savings

— Subsea construction area
  • Subsea trees
    - Space for stacking and testing three trees
    - Overhead gantry crane with anti-swing guidance
    - Capable of trees up to 150 mt

  • Moonpool transporter cart
    - Recessed to handle up to 13 m high trees
    - Skids to either main or auxiliary rotary
    - Rated for 350 mt
    - Key slotted for casing hang-off

  • Space and utilities provided for third party
    - Subsea construction cabin and workshop

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MORE EFFICIENT USE OF SPACE

Storage of 140 joints of 75 ft riser (10,500 ft) is located in the hull resulting in more deck space for pipe racks and well test area.

MORE DECK SPACE

Roughly 50% more usable deck space than previous generation Samsung drillships

- Complete with new aft pipe rack arrangements that give ability to store long assemblies, wellhead joints and doubles of casing up to 100 ft

<table>
<thead>
<tr>
<th>Area</th>
<th>Capacity</th>
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<tbody>
<tr>
<td>Well Test Area</td>
<td>550 m²</td>
</tr>
<tr>
<td>Aft Casing Storage</td>
<td>300 m²</td>
</tr>
<tr>
<td>On-Deck Riser Storage</td>
<td>300 m²</td>
</tr>
<tr>
<td>Fwd. Pipe Storage</td>
<td>1,100 m²</td>
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ENHANCED FEATURES FOR OUR CLIENTS

— Expanded space
  • Office space with CCTV monitors
  • Server room with redundant HVAC for controlling heat loads
  • Third-party room provided on underside of drill floor to improve communications and safety

— Extended communication systems
  • Rig-wide telephone system, Talkback, CCTV, PA/GA, fire and gas systems including third-party locations on deck

— Provision is included for a suite of third-party devices:
  • Mudlogging cabin – space and utilities for 30’ cabin
  • MWD/LWD cabin – space and utilities for 30’ cabin
  • Wireline unit – space and utilities (either diesel or all-electric)
  • Cement unit – fully commissioned dual mixing high capacity unit provided
  • ROV – space and utilities for dual 250 hp spreads
  • Cuttings Drying – space and utilities (preconfigured for Verti-G type dryer)
  • Rig Vacuum – utilities
  • Subsea Construction – space and utilities for 20’ cabin and 20’ workshop
  • Brine Filtration – space and piping for dual filter press spread
  • Well Testing – space and utilities for cabin, extensive power and piping utilities for test area, burner boom
  • ADCP Current Meter – platform and utilities provided

ABILITY TO CUSTOMIZE

— Clients making an early commitment to ENSCO DS-9 or ENSCO DS-10 have the ability to further customize the rigs to suit their needs with no construction delay:
  • Design office spaces within space available in the quarters building
  • Fully customize third-party systems, utilities, and spaces
  • Define the client network and communications systems for seamless installation in the shipyard
  • Upgrade the BOP system with a second BOP, seventh Ram and/or additional control pods (this feature is already included)
  • Add a fifth or sixth mud pump
  • Upgrade the shale shakers to triple deck units
  • Install development-specific requirements:
    • Managed pressure drilling (this feature is pre-piped and ready to be installed)
    • Underbalanced drilling
    • Completions gravel pack/frac spread utilities and piping
    • Completions subsea test tree/tubing hanger running tool facilities
    • Completions flatpack reels
    • Clean cuttings burning or cuttings blowing conveyor systems
Rig Specifications

GENERAL INFORMATION

Unit Design
Samsung GF 12000

Builder
Samsung Heavy Industries

Year of Construction
2015

Unit Classification
ABS &A1E - Drillship

✠ AMS
✠ ACCU
✠ DPS-3
✠ SH-DLA
✠ CDS
✠ NBLES
✠ ENVIRO+
✠ HELIDK (SRF)

Unit Flag
Marshall Islands

SPECIAL FEATURES

Rig Type
Dynamically Positioned Drillship (DP3)

Accommodation
200 POB in single or double cabins

Helideck
75 ft, octagonal
EH101 (14.6 mt)

Station Keeping Type
Dynamic positioning with 6 thrusters

Max Water Depth
12,500 ft (equipped for 10,000 ft)

TECHNICAL DIMENSIONS

Length Overall 754.5 ft
Breadth 124.6 ft
Depth 60.7 ft
Operating Draft 36.1 ft
Vessel Payload Capacity 22,000 mt
Moonpool Size 84 ft x 41 ft

MACHINERY

Main Power
6 x Wartsilla diesel engines (3 engine rooms with 2 engines each). Engines rated at 10,300 hp (7,680 kW) at 720 rpm driving an ABB AC generator rated at 7,000 kW (42,000 kW total)

Emergency Power
1 x STX-Cummins 1,700 kW diesel engine driving an ABB AC generator rated at 1,700 kW at 1,800 rpm

Deck Cranes
Main Cranes
2 x NOV Hydralift Offshore Knuckle Boom Cranes rated at 85 mt at 59 ft radius and 17 mt st at 138 ft radius
1 x Lattice Boom Crane rated at 85 mt at 26 ft radius and 7 mt at 161 ft radius
1 x Active Heave Compensating subsea construction crane rated for 165 mt and capable of running 100 mt loads to 10,000 ft

Helideck Service Crane - 1 x pedestal crane rated at 10 mt 65 ft radius

Riser Gantry Cranes - 3 x NOV Hydralift hydraulic power and rated 2 x 20 mt

Subsea Tree Gantry Crane - 1 x 150 mt

Pipe Handling Knuckle Boom Crane - 1 x 9 mt

BOP Gantry Crane - 1 x 480 mt

Transit Speed
12.5 knots max/10 knots transit (uses half the amount of fuel as previous Samsung design in transit)

Maximum Operating Conditions
10-year storm conditions
Wave 19 ft
Wind 50.5 knots
Current 1.2 knots

Survival Conditions
Wave 47.2 ft
Wind 100 knots
Current N/A
**STATION KEEPING**

**Dynamic Positioning**
Kongsberg DP3 system controlling 6 thrusters

**Thrusters**
6 x Rolls Royce 5.5 mw (33 mw total) underwater dismountable fully azimuthing thrusters with fixed blade propellers and nozzles
All thrusters are fully retractable

**Reference System**
Kongsberg Differential Global Positioning Systems with 2 modules, 4 GPS receivers and 4 antennas
Kongsberg Hydro Acoustic Positioning Reference System with 2 HIPAP transducers and 5 transponders
- C Node
Peripherals include 3 gyro compasses, 3 wind sensors, 3 motion reference units and 1 remote joystick panel
HAIN – Hydro Acoustic Inertial Navigation
DRILLING EQUIPMENT

Derrick
NOV “Dual Derrick” 210 ft clear height x 80 ft x 60 ft base. Main load path rated at 1,250 tons and auxiliary rated at 1,000 tons

NOV Hydralift fingerboard “triples” of range 3 tubulars or “quadruples” of range 2 tubulars
  - Fingers configured for 273 stands of 6 5/8 inch DP or 112 stands of 5 7/8 inch DP
  - This system is capable of racking back casing sizes ranging from 7 to 16 inches in the capacities below:
    - 7 in. – 106 ea.
    - 10 in. – 162 ea.
    - 14 in. – 80 ea.
    - 16 in. – 40 ea.

Drawworks
1 x NOV Dreco Model AHD-1250-9000 with regenerative braking driven by 6 x 1,500 hp AC motors
1 x NOV Model AHD-1000-6900 driven by 6 x 1,150 hp AC motors

Top Drive
2 x TDX-1250 driven by 2 x 1,340 hp AC motors
Main Top Drive - 1,250 tons and 105,450 ft-lbs continuous torque @ 130 rpm
Auxiliary Top Drive - 1,250 tons (limited to 1,000 by load path) and 105,450 ft-lbs continuous torque @ 130 rpm

Traveling Block
NOV with 7 sheaves x 72 in. groove diameter with retraction system (1,250 ton capacity main and 1,000 ton capacity auxiliary)

Rotary
1 x NOV Model VBJ-RST-60 ½ in. rated for 2,000 kips
1 x NOV Model VBJ-RST-75 ½ in. rated for 2,000 kips

Cementing Unit
Space and utilities provided for 2,300 hp for third party configured with dual mixing system capable of pumping at twice the rate of standard units

Pipe Handling System
2 x NOV Hydralift Model “Hydraracker IV” Vertical Column Rackers to handle stands of tubulars from 3½ in. to 16 in. and single joints to 20 in.
2 x NOV Model ARN 200 Hydratong “Iron Roughnecks” with Farr Casing tong to handle tubulars from 2 3/8 in. to 20 in.
Horizontal to Vertical tubular transfer machine
NOV Hydralift Model CWS-P10-45HS pipe handling catwalk shuttle
NOV Hydralift Model R45-75-HS riser handling catwalk
NOV Griffith Torquemaster model 8045 bucking machine capable of handling 3 1/2 in. to 12 in. tubular

Mud Pumps
4 x NOV Model 14P220 triplex, 2,200 hp, 7,500 psi max., each belt driven by 2 x 1,150 hp AC motors
Space provided to upgrade to six pumps

Shale Shakers
6 x NOV Brandt model VSM 300 w/fume extraction hoods

Gumbo Conveyor
1 x NOV Brandt w/2,200 gpm capacity

Desander
1 x NOV Brandt SR3 w/3 x 12 in. cones over designated shale shaker

Desilte
1 x NOV Brandt SE-24 w/24 x 4 in. cones over designated shale shaker

Mud Centrifuge
2 x NOV Brandt HS-3400-FVSD

Degasser
2 x Brandt DG-12

Cuttings Conveyor
5 x Brandt screw type
**SUBSEA EQUIPMENT**

Space provided for storage and service of two BOPs

**BOP**
2 NOV Shaffer NXT 18 ¾ in., 15K wp BOP with 7 Rams and Vetco SHD-H4 connector

**LMRP**
18¾ in. Vetco Model E x F High Angle Release H-4 with 2 NOV Shaffer 18¾ in., 10K wp spherical BOPs

**Diverter**
75½ in. NOV Shaffer Model CSO, 500 psi with 5 outlets, 18 in. flowline, 2 x 18 in. diverter lines, 6 in. well fill up line and 6 in. trip tank line

**BOP Handling**
1 x NOV Hydralift Overhead crane rated 2 x 240 mt (480 mt total) with 2 x auxiliary hoists rated at 35 mt
1 x NOV Hydralift Moon Pool Cart rated at 540 mt

**Xmas Tree Handling**
NOV Hydralift trolley rated at 350 mt
Gantry crane 2 x 75 mt (150 mt total)

**BOP Control System**
1 x NOV Shaffer Multiplex BOP control system complete with BOP control unit satisfying API 16D specification
Autoshear/Deadman system, Acoustic backup control through ship’s positioning transceiver and portable tank

**Marine Riser Details**
10,000 ft of 21 in. Vetco MR6-HSE riser in 75 ft joints with 3½ MM lb connection. Equipped with 2 x 4½ in. ID 15K WP choke and kill lines, 1 x 4 in. ID 5K WP booster line and 2 x 2 3/16 in. ID 5 K WP hydraulic conduit line

**Riser Tensioners**
8 sets NOV Hydralift dual wire line tensioners rated at 225,000 lb each with 50 ft stroke and anti-recoil system
Total system capacity 3,600,000 lb

**Choke and Kill Manifold**
3 1/16 in. x 15K/10K WP with 2 manual chokes, 2 remotely operated chokes and hydraulically operated valves with glycol injection systems complete with full instrumentation
• Split buffer chamber
• Dual port/starboard high pressure emergency overboard lines

**Riser Gas Handling System**
DRILLSHIP CAPACITIES

Vessel Payload Capacity – Operating 22,000 mt
Vessel Payload Capacity – Storm 22,000 mt
Vessel Payload Capacity – Ocean Transit 17,000 mt
Liquid Mud 16,970 bbl
Brine 7,540 bbl
Base Oil 7,540 bbl
Bulk Mud 24,000 cu ft
Bulk Cement 26,800 cu ft
Sack Material 10,000 sacks
Drillwater 15,090 bbl
Potable Water 7,540 bbl
Fuel Oil 44,020 bbl
Storage Area Fwd Deck: 10,760 sq ft
Aft Deck: 25,800 sq ft
Riser Storage Area In Hold
Well Test Area Aft Deck: 5,150 sq ft
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