

RamRig™

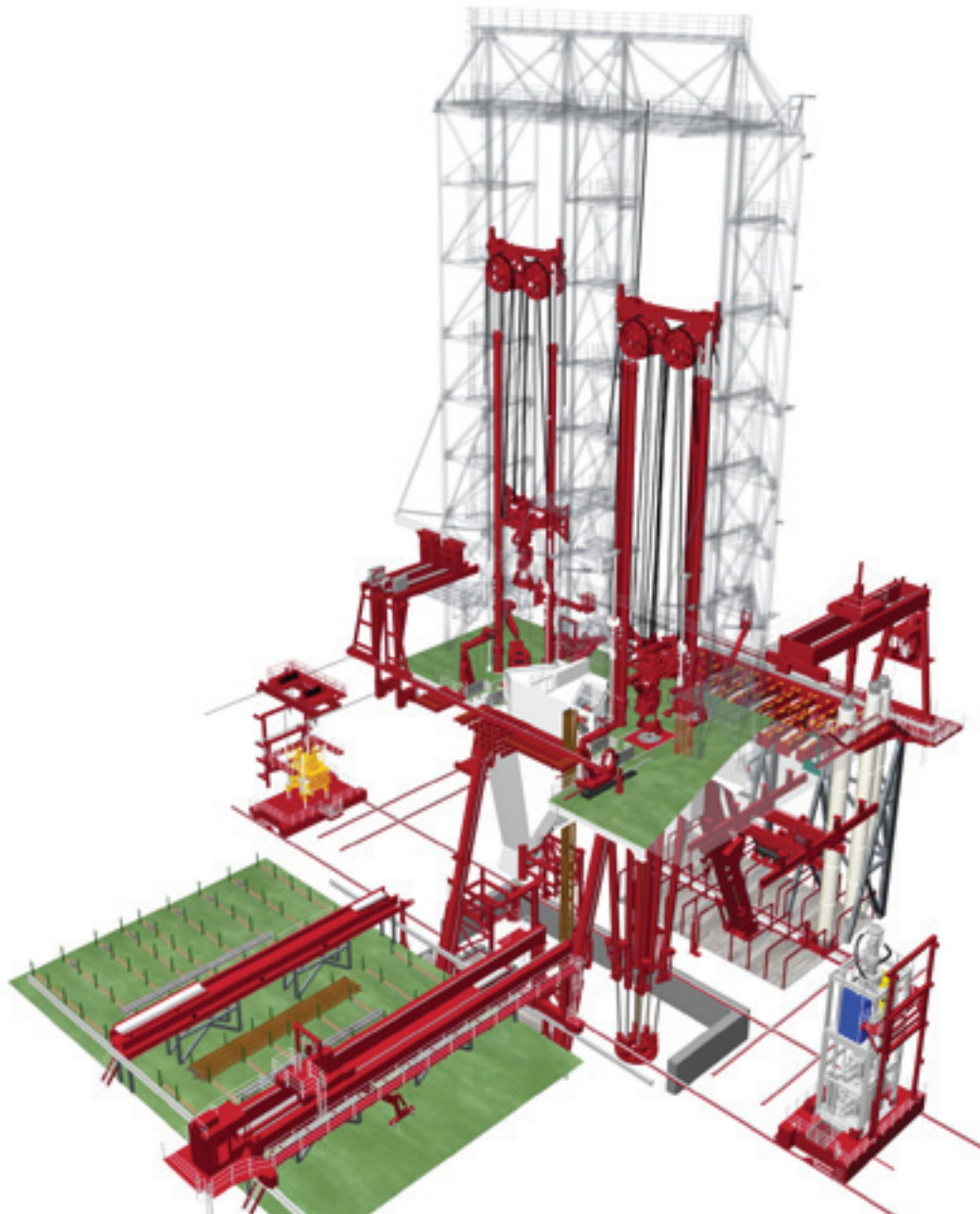
The RamRig™ represents state-of-the-art technology with a well proven and successful operational track record since 1998. It can be applied to fixed and floating drilling platforms. The concept's inherent features make it especially competitive on deepwater rigs. The concept is available with single, double or triple stand rigs with capacities delivered from 150 to 1,000 tons, and can easily meet future demands for higher hoisting capacity and setback capacity.

RamRigs have successfully operated in international waters for oil companies such as BP, Chevron Texaco, Amerada Hess, Marathon Oil, Conoco and Shell in the following locations: West Africa, Greenland, The Faeroe Islands, the UK, Ireland, Canada and Egypt.

A dual RamRig™ is the ultimate deep water rig. This rig provides dual rig functionality at a significantly lower total operational cost than a comparable conventional dual rig solution.



Dual RamRig™ - West Phoenix



Main Features

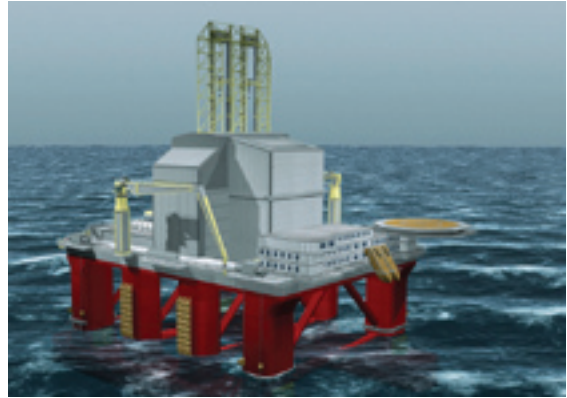
- Safety, fingerboard at drillfloor level. Less over-head operations
- Documented lower weight, reduced space requirements and improved safety compared to conventional drilling packages
- Lower centre of gravity increases variable deck load (VDL) capacity
- Highly flexible and accurate integrated long stroke active/passive heave compensation and state-of-the-art control systems, improved operational efficiency
- The impressive accuracy and built-in automated drilling function results in a smoother well path, less weight on bit (WOB) variations and optimization of the rate of penetration (ROP)
- No drawworks, considerably increased braking capacity and minimal risk of dropping the BOP/riser

Drillfloor and Substructure

Due to its unique design, all tubulars on the RamRig™ are racked vertically from drill floor to lower setback, saving valuable deck space without reducing the rig's drilling capacities. The concept is therefore ideal for deepwater operations. The vertical racking of tubulars has the following main advantages:

- All pipe handling functions are independent of the hoisting operations
- Opening and closing of the elevator always takes place at drill floor level, not at high level in the derrick
- Simplified equipment for horizontal to vertical pipe handling
- Reduced possibility of dropping objects

The elevated drill floor also enables a very efficient and safe working environment for handling BOP and subsea equipment.



Dual RamRig™, Aker Spitsbergen



Dual RamRig™, West Eminence



Dual RamRig™, West Venture

RamRig™ Key Components

The hoisting system on the RamRig™ consists of two or more cylinders (depending on capacity requirements) instead of the conventional drawworks and derrick. The hoisting lines are of fixed length, parallel lines with one end anchored at the drill floor, the other end at the Top Drive. The lines are run over the yoke sheaves, thereby transforming the push from the rams to upward lifting force to the Top Drive. Subsequently, the travelling distance and speed of the Top Drive is double the stroking of the rams. The stroking velocity of the rams is maximum 1 m/s (3.3 ft/s), which gives 2 m/s (6.6 ft/s) travelling speed for the Top Drive.

RamGuides

The RamGuides replace the derrick or mast used in a conventional drilling set-up, and are built for the purpose of guiding only, not for lifting. As the load is taken by the drill floor structure, and not from the top of a derrick structure, the RamRig™ concept provides a lower weight and center of gravity. With RamGuides installed, there is no need for crown block or travelling block.

Rams

The Rams, or cylinders, are of the same type as those used in the well known Aker MH crown compensators. The cylinders are coated with a non-corrodible and durable ceramic layer extending the operating lifetime of the cylinders. The Rams have a noncontact position measurement system with an accuracy of 1/100 mm.

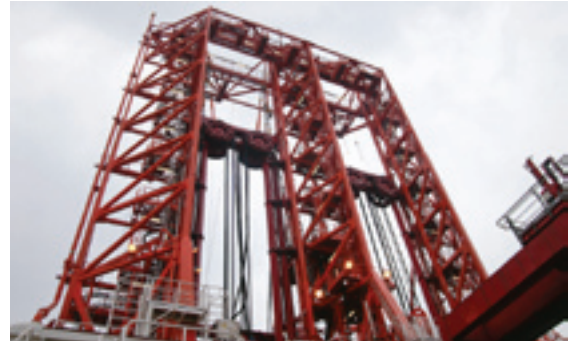
Equalizer Assembly

The equalizer assembly at drillfloor level absorbs uneven wire stretch and ensures even loadstress of the wires during their lifetime.

Hydraulic System

The hydraulic system is used to power the hoisting, lowering and heave compensation operations. The system is comprised of a number of hydraulic pumps (normally 8) driven by diesel engines or constant speed AC motors, hydraulic reservoir, valves for mode selection and nitrogen accumulators. The system is highly flexible and redundant in configuration.

The heave compensation system has three modes of operation. In passive mode, the nitrogen bottles are directly connected to the Rams. In this mode, the system may operate continuously without use of electric power. In semi-active mode, nitrogen bottles and the hydraulic system work together to reduce system friction. In the truly active mode, the hydraulic system is used to compensate for the heave.



Dual RamRig™, West Phoenix



Drillfloor Overview

Conventional Drilling Rig Packages

Complete Derrick Equipment Sets (DES) and Drilling Support Modules (DSM) can be provided on an EPC basis.

Aker MH draws upon well-qualified and experienced in-house resources to participate in and/or provide the following services as part of the complete drilling facilities delivery;

- Project management
- Conceptual design/front-end engineering design (FEED)
- Detail engineering and procurement
- Supply of complete drilling equipment/mud treatment packages, including third party supplies
- Fabrication, supervision and follow-up
- Commissioning, supervision and assistance
- Life cycle/operational support



West Sirius, Seadrill

