Tough business in rough water
Offshore Technology

Complete Drive and Control Solutions
As an example, technology used in 6 DOF-motion systems to train pilots, or used in laboratory testing is also applied to offshore access systems for crews, to active compensation systems for deep-water operations, etc.

The integration of different drive concepts, mechanic, hydraulic, pneumatic and/or electric, with sophisticated controls results in enormous progress regarding accuracy, reliability, weight reduction, power consumption, maintenance cost, and last but not least the window of operation. The effectivity and efficiency of your installation or vessel increases significantly.

The in-house combination of all her disciplines enables Bosch Rexroth Systems & Engineering to offer very special solutions and benefits to her customers. That makes Bosch Rexroth Systems & Engineering so unique and versatile.

Bosch Rexroth bases her concepts on integrated design. Life cycle management and safety are the basis for design and services offered. Reliability, availability and maintainability are considered in design and form the layout for service and maintenance. Through a combination of preventive maintenance, expertise, state of the art condition based monitoring and world-wide available service life cycle costs are reduced and availability is increased.
Integrated project approach.

Being an appreciated partner in worldwide offshore operations, Bosch Rexroth Systems & Engineering utilizes the company’s extensive knowledge and project experience offering her partners and customers a close co-operation at design, manufacturing, project execution and life time management for a large variety of drive and control solutions for the Offshore Industry.

Through the years this integrated project approach, supported by in-house design and manufacturing of heavy duty hydraulic cylinders, tailor-made hydraulic power units, sophisticated software and controls, and a worldwide operating service organization, Bosch Rexroth Systems & Engineering has met her customers high confidence level based on thorough risk analyses. Prominent examples are the successfully performed 6 meter simultaneous jack up of the Ekofisk platforms with a combined weight of over 40.000 tons, the worlds largest shiplift with a capacity of 25.000 tons and replenishment at sea systems.
From unique designs to pre-engineered concepts.
Examples of products

- Drillstring compensators
- Wireline compensators
- Riser tensioners
- Production riser tensioners
- Rack & Pinion jacking systems
- Cylinder jacking systems
- Pin claw skidders
- Gripper jack skidders
- Modular deckmating units
- Modular active heave compensation system

For the most divers maritime activities, such as drilling, mining, salvage operations, subsea operations, geotechnical surveys, deckmating, decommissioning, pipe laying and dredging, Bosch Rexroth Systems & Engineering has developed drive & control solutions. These projects often are unique engineered to order. But for some fields of applications Bosch Rexroth Systems & Engineering has defined pre-engineered concepts, so-called system packages, leading to a fast and cost effective realization, based on proven in practice technology. System packages are available for e.g.:

- Heave compensation
- Skidding
- Jacking
- Deck mating/topside removal

These system packages are not off-the-shelf products but (modular) concepts, based on a long-term experience and expertise in those particular fields. The relevant basic design will be customized to the requirements as specified for the project in question. From this a complete optimally adjusted solution emerges, based on tomorrows technology.
Heave compensation

Downtime during offshore operations, due to rough weather conditions, is a well known problem to many operators. Loss of capital, and severe damages to customers durable and expensive equipment, is a nightmare. Excessive dynamic amplification of the load, can occur during lowering with the risk of overloading or even rupture of the cable. Controlling heavy loads under severe circumstances, going safely to deeper locations, or accurately positioning of loads on the seabed is a major issue for many offshore contractors.

Rexroth has developed, built and thoroughly tested all its heave compensation systems, being winch or cylinder driven.

Heave compensating systems are applied for various operations such as drilling, mining, salvage operation, deckmating, decommissioning, installation, pipe-laying, lifting, surveying and dredging.

Heave compensating systems vary from passive to active systems from 50 up to 12,000 tons applied for winch or deckmating systems. Active heave compensation can be delivered integrated in the main drive systems as well as an add-on on an existing winch. Active heave is executed combined with passive heave compensation and enables smooth operation with significant reduction of installed power. Active heave compensation systems are accurate in positioning, keeping your load in a steady position, where as power reduction is feasible up to 85%.
Skidding

Whether it concerns a rig skidding system, one for load out skidding or a skid-dable A-frame for a floating crane, Rexroth has the solution for the total drive system, related controls and the required mechanical components.

The concepts are diverse: hydraulic or electrical powered, motor or cylinder driven, with pins/claws, rack and pinions or gripper jack elements, modular or not, from our standard range or engineered to your requirements. All options are open.

Features and possibilities

- Push/pull forces from 100 to 1000 tons
- Hydraulic pressures up to 350 bar
- Intrinsic safe electric systems
- Reversible skidding possible
- Double acting gripper clamps, which ensure gripper release
- Ceramax coated cylinder rods
- CIMS (Integrated stroke measuring system) for accurate and automatic skidding
- Remote operation
- Adjustable gripper width
- Skid mounted power unit and controls for easy installation
- Power unit electric or diesel driven, explosion proof
- Built-in synchronization
Deck mating and Topside removal

Installation and decommission vessels are highly complex ships with advanced systems for positioning, heave and anchoring to bring offshore modules on shore/offshore. Heavy duty load out skidding systems are an efficient way to shift complete modules and structures on and off barges. Rexroth has developed systems with a push/pull force up to 1000 tons per cylinder. We have contributed to float over projects with loads up to 25,000 tons with divers principles such as Smartleg, Hi-deck and Unideck. Deckmating systems are used to position/remove topside on/from their jackets, with hydraulic cylinder movements and vessel ballasting technology. Despite of heave and influence of the wind, an active load transfer system ensures a perfect and controlled landing to the base. Engineered to order systems can be equipped with features as fast lifting, positioning and sea fastening.

Next to tailor made systems to customer specifications Rexroth also has developed its own modular system. This system asks almost no modifications to the barge and can be built out at which the controls of the stand alone units are centrally coordinated.
Jacking

Depending on the requirements, based on the type of work and the environmental conditions, the choice between various platform concepts may lead to jack up platforms.

When it comes to jacking systems for these self elevating platforms (SEP’s) Rexroth has built them in various sorts and sizes, both rack & pinion installations and positive engagement systems for offshore and inland applications. Having all drive disciplines under one roof, hydraulic and electric concepts have emerged from the engineering department.

Hydraulic rack & pinion systems, in the range of 500 to 2,000 tons per leg, contain in-house fabricated motors, gearboxes, power units using standard or tailor made components. Patented load sharing devices ensure equal load distribution over the pinions, increasing safety and lifetime of the jacking system. As an electrical alternative Rexroth has developed a sophisticated Variable Speed Drive system, using frequency controlled AC-motors. The advantages are a smooth start and controlled operations, load sharing for equal load distribution, accurate speed control, a significant longer lifetime and lower maintenance costs of the entire installation. On top of that the deck construction can be optimized and down scaled due to less stress in the jacking houses.

Positive engagement systems using jacking cylinders and cylinders for the catch and holding beams have been incorporated in three, four and six legged platforms. Double yoke jacking systems, increasing the performance of the platform have been designed for jacking capacities up to 15,000 tons, holding capacities up to 30,000 tons and a lifting speed of 30 meters per hour. CIMS (Ceramax Integrated Measuring System) provide details about the accurate position of each cylinder, while load registration guards the progress of the procedures.

The control system is designed for central and local operation and provides the means for leg handling, pre-loading and platform handling.

A record-breaking achievement was the simultaneous elevation with 6,5 meters of the 40,000 ton weighing Ekofisk platforms, with an accuracy of 1,5 cm over a length of 1100 meters. This and other projects show that Bosch Rexroth is capable of performing challenging turn key elevating projects by the integrating drive technology and related controls. For now and for the future.
Intelligent hydraulics in new dimensions

Wherever forces need to be utilized economically, the advantages of industrial hydraulics are obvious — whether it is required to lift and lower loads smoothly, perform linear or rotary movements, achieve constant acceleration, maintain given speeds, approach positions exactly, transmit powers or interlink sequences.

Rexroth is the technology and market leader in industrial hydraulics with a comprehensive product range and distinct application expertise.

At Rexroth you can select from the worlds’ largest standard product range in the field of hydraulics, application and customer-specific system solutions of high quality. With advanced micro-electronics Rexroth has made hydraulics even more powerful.

For you, Rexroth is the ideal partner for developing highly efficient machines and production facilities — from the first point of contact to commissioning and throughout the entire life cycle. Teams that operate worldwide carry out the complete engineering of your systems and, if requested, up to the hand-over of turnkey systems and beyond — service included.

Thanks to the use of hydraulic drive and control technology from Rexroth you will be more competitive than ever.

Rely on service across technologies
Rexroth integrates all services for the entire product spectrum in the field of factory and industrial automation into a single organization: from immediate support, spare parts service, field and repair service, retrofit/modernization through to training.
Tough business in rough water.
Who do you turn to if you need a drive solution to land your valuable equipment under rough conditions on the bottom of the sea in a fully controlled way? Who is able to skid your platform module out, place it by floating over on the jacket and decommission the whole platform at the end of its lifetime? Where do you find a system supplier that covers the globe with service?
For those matters you need a partner who understands your business, helps you to enlarge your window of operation and increases your business opportunities, while taking out of your hands all troubles by delivering a turn key system.

No matter the challenge, Bosch Rexroth System & Engineering has the answer to your offshore Drive & Control-questions. Whether high in the derrick or deep down under water, our system solutions are accurate, reliable and cost effective, especially designed for the environment in which they are to be used. Compromises are not good enough.

With courtesy of Maritime Hydraulics AS and Gusto MSC.