Excellent reliability on board

Innovative offshore drilling solutions from Siemens

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Extra performance reserves for demanding requirements

While oil and gas exploration and production are moving to ever more harsh environments, offshore drilling equipment is expected to provide the utmost reliability and availability day in, day out. Discover how Siemens, a long-standing solution provider for the offshore drilling industry, provides innovative solutions that benefit all stakeholders in the offshore drilling business.
Innovative solution packages for offshore drilling that secure reliable operation and availability are in high demand. Such solutions are exactly what Siemens has to offer – based on broad expertise in electrical, instrumentation, and telecommunication (EIT), rotating equipment, and water treatment solutions as well as years of hands-on experience in the oil and gas business and marine applications. Siemens’ scope of supply covers the entire life cycle of equipment and assets, thus ensuring long-term reliability and ideal investment protection. Moreover, thanks to long-standing business partnerships with leading shipyards, naval architects, and drilling service operators, Siemens understands what the needs and demands of the market are – and how to deliver tailor-made solutions.

Many good reasons for a close partnership

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Benefits for shipyards

Today’s offshore vessel market is highly competitive and characterized by tight schedules. This is why the close partnership with a solution provider, who is able to supply entire higher-level assemblies on a one-stop basis, is highly advantageous.

Siemens as a reliable strategic partner provides decades of experience in marine and offshore applications, plus the market leader’s expertise in EIT, drive technology, and water treatment. This ensures substantial development and engineering de-risking, and enables shipbuilders to focus on their core business without having to worry about elements of uncertainty.
Introducing the next level of innovation

Contributing to more efficient technologies
Oil and gas as energy sources will remain the backbone of tomorrow’s global energy supply. However, while global demand for oil and gas is still soaring, focusing on the environmental footprint in exploration and production will lead to a rising demand for new, more efficient, and reliable solutions.

As the drilling industry meets new technological challenges to explore new fields in sub-salt and pre-salt areas or arctic and harsh environmental areas, the need for predictability and sustainable solutions will also rise to higher levels.

Today, Siemens takes a front-runner role in providing state-of-the-art technology to several high profile projects around the globe; operations in arctic regions, the North Sea, Gulf of Mexico, West Africa, the Far East, and offshore Brazil will all profit from the benefits of our systems. Siemens Oil & Gas will continue to develop trendsetting technologies that focus on reliability, operational performance, and competitive solutions.

Reliability, redundancy, and performance linked together with competitiveness and expertise from Siemens, will ensure the asset’s return on investments throughout its entire life cycle.
Offshore drive solutions
Siemens has developed a range of standard offshore low-voltage drives that can fit all decisive applications on an offshore vessel: thrusters, drilling and jacking systems, pumps, winches, and fans, for instance. These drives, ranging from 75 to 5,500 kW, ensure a high degree of standardization resulting in minimized maintenance costs, easy servicing, and wide spare parts interchangeability.

BlueDrive drilling drives
The new drilling drives, designed with the participation of several clients and shipyards, ensure cost-efficient solutions for a vast range of applications. They are approved by all major classification societies, and can be customized according to customer demand. They also feature a redundant high-speed communication network and are prepared for cRSP, Siemens remote access system, and a condition-based monitoring system, PIMAQ.

DP3 closed-ring solution, focused on HSSE and operational performance
Power management is vital for dynamic positioning. Failures in the power system as well as component and external faults must be identified as they occur and the faulty elements need to be isolated from the system. This is ensured in DP3 system operating mode in closed-ring configuration. Moreover, a backup system will be put in operation in case of malfunction of the primary safety devices.

Siemens has cooperated with major drilling companies and the classification body to develop solutions operating in DP3 mode with a single fully integrated power system.

The Siemens solution enables operation with fewer engines online, giving better performance of operation. This entails a number of advantages:

- reduced fuel consumption and lower emissions
- reduced contamination of the engines
- diesel engines running at a higher load level
- improved selectivity in the main power system
- improvements of the vessel’s maintenance program
BlueDrive compact drilling

Siemens’ new power plant solutions for jackup drilling rigs and accommodation units connects generators directly to a DC bus through rectifiers. The system makes synchronization between generators obsolete and allows load sharing.

The new rig power system can be combined with existing drilling and jacking drives as well as various power sources and brings about several advantages in construction, operation, and maintenance, such as:

- reduced weight up to 40 percent and reduced size up to 30 percent due to the need for a mains switchboard and 12/24 pulse transformers feeding drives systems
- extremely fast engine start-up
- ultra-fast blackout prevention and shorter recovery time
- no issues with harmonic distortion due to DC distribution and AC drives feeding all loads
- reduced fuel consumption
- less wear and tear

BlueDrive jacking drives

Siemens has developed an electrical variable-speed-drive jacking system that can significantly speed up the jacking process. Its unique diagnostic systems give precise data feedback during operation, which allows optimal speed and torque control as well as synchronization. This helps reduce the possibility of mechanical overstress and wear of the legs, and it makes the need for system overrating a thing of the past. The new Siemens BlueDrive jacking drives thus make possible higher efficiency, time-savings, cost-optimization, and improved investment protection.

Moreover, the new BlueDrive jacking system also helps save energy, as less power and less cooling capacity are required. The electrical jacking system is approved by ABS, DNV, and LRS.
BlueDrive thruster drives
Siemens has introduced an AC drive system specially designed for propulsion applications, which ensures the safe and reliable operation of the vessel under all conditions. Particular effort has been made to ensure reliable handling of both the dynamics within the power supply system and the various load conditions at sea.

The BlueDrive system comes with a fast-responding blackout prevention system and is capable of pre-charging. It can, therefore, be regarded as a non-heavy consumer. Its compact converters minimize footprint, and thereby costs, and the system’s separate transformers ensure a high degree of flexibility in the choice of mounting locations. This helps save up to 30 percent space and reduce power loss in the electrical room by as much as 50 percent. The integrated SINAMICS control platform simplifies plant integration, installation, and operation.

Water-jacket-cooled motors
Siemens Loher, a Siemens subsidiary, has developed a new range of water-jacket-cooled drilling motors in a flameproof and explosion-proof design. The water-jacket-cooled motor enables low noise and vibration levels. The motor, which comes in a totally closed housing, is designed for high reliability and long service intervals.

Automation and electrical information management
With its consistent modular automation solution SIMATIC S7, Siemens is the global market leader for drilling applications. SIMATIC S7 offers a fully scalable, modular architecture, which provides the opportunity to capitalize on existing and future technical innovations. It is a highly reliable and flexible solution, allowing for the total integration of the automation and electrical systems to greatly increase electrical efficiency in the drilling environment. This includes the ability to seamlessly integrate safety systems up to SIL 3 with single configurations for applications such as BOP control. Siemens can supply information management systems, asset management, and other advanced control features that can be seamlessly integrated into the SIMATIC S7 systems for drilling.
Siemens solutions guarantee outstanding levels of reliability and availability in offshore drilling throughout entire system life cycles.

Benefits for naval architects
The need for powerful and robust equipment able to drill in ultradeep water and withstand even the harshest environmental conditions is a real challenge. It basically means that more equipment is required on a drilling facility whose basic design ought to remain unchanged for reasons of cost and efficiency.

Siemens supplies intelligent EIT and water solutions which offer a number of outstanding properties that help keep design changes to a minimum: minimal space requirements, low weight, and seamless integration with the vessel’s infrastructure. This means that engineering efforts can be reduced, and fundamental changes to the overall design of the vessel, which entails considerable risk, can be avoided.

Benefits for operators and investors
Assets and equipment are expected to run continuously. Any downtime means lost profits.

Siemens, with its recognized best-in-class expertise, its competitive products, solutions, and its 24/7 global service with fast response times, provides the technical basis for profitable business in the drilling sector. Siemens’ understanding of the industry’s needs and demands, as well as reliable solutions along the entire life cycle of all assets and equipment, give reassurance, help increase efficiency, and make for excellent performance.
Solutions that pay off throughout the entire life cycle

Expertise you can rely on
Siemens’ solution packages for offshore drilling vessels address the entire life cycle of all equipment and assets and make possible an ideal, risk-minimized integration. All solutions are characterized by a number of decisive advantages:

- designed for the harshest environments
- shock and vibration-tested to meet the needs of naval applications
- adapted to the special conditions on drilling vessels
- high reliability and availability, as well as minimal maintenance and servicing requirements
- high degree of operational safety
- designed in compliance with international standards, regulations, and requirements
More than you expect – even from the market leader

Siemens is the world’s only energy infrastructure company with expertise throughout the entire energy conversion chain and the world market leader in process automation systems. This is why you can expect a lot from Siemens when it comes to innovation and performance.

Siemens supplies trendsetting solution packages for offshore drilling vessels of any type based on the combination of innovative EIT, process, and drive technologies. The company’s range of products and services covers the entire life cycle of a drilling facility, from support in the conceptual stage and the design phase through technical solution packages all the way to training, operational support, and life cycle services such as maintenance, modifications, and retrofits.

Siemens is also able to support vessel owners through direct debt financing models and can help maximize EXIM bank financing.

Consortium models may also include deliverables outside the standard scope, such as diesel engines, thrusters, DP, and vessel automation. All these components will be delivered with minimum interface risk for the end-customer and the shipyard.

Siemens’ strong local presence around the globe ensures that manufacturing and implementation can be carried out locally, in short process chains with a high degree of regional value added.
Sophisticated one-stop solution packages for offshore drilling vessels

Unified telecommunication, navigation, and surveillance
Siemens has been engineering and supplying integrated telecommunication and navigation solutions for the oil and gas industry for decades.

Navigation and telecommunication solution packages from Siemens can include specially customized bridge solutions comprising all necessary equipment for navigation, communication, and on-the-spot surveillance. A telecom management system then combines all system components in a single user interface and provides telecom access, remote control capability, and access to remote diagnostics at any LAN connection point on the vessel. An uninterruptible power supply ensures the failsafe power supply of all automation, navigation, and telecommunication facilities on board, even in harsh environments.
Innovations in water treatment
Siemens supplies the entire range of solutions for the water treatment needs of topside facilities. Conventional methods of wastewater treatment usually include waste containerization and transportation to shore, which is a costly, time-consuming, and labor-intensive process. This is why Siemens has developed a compact, self-contained solution that offers considerable advantages, with waste fluids being treated and discharged on-site without the need for interruption of the drilling activities.

The system impresses with high process rates and is more economical than off-site transportation. It is also available as a retrofit solution and makes it possible to treat wastewater streams to below overboard discharge standards.

A new reverse-osmosis water-treatment system for off-shore facilities enables the generation of high-quality water onboard and makes costly water transport to the platform a thing of the past. Reverse osmosis produces pure water by forcing waste or saline water through a semi-permeable membrane.

The new Siemens reverse-osmosis system comes as a rugged, pre-engineered, preassembled, and standardized compact, single-skid unit for easy installation that helps minimize installation and start-up costs.
Solid partnership on solid foundations

Specially tailored life cycle services
Siemens is the only company that can offer such a wide range of products, solutions, and services for offshore drilling facilities. Specially integrated package solutions make it possible to ideally exploit all synergies and at the same time meet individual demand. Whatever you require, Siemens is prepared to offer planning, engineering, products, solution packages, maintenance, and secondary services – as a complete one-stop solution or as an offering range to choose from throughout the entire life cycle of the vessel.

Expert service always at your fingertips
Siemens provides customized service plans that can comprise troubleshooting, 24/7 hotline support, spare parts delivery, repairs, system upgrades, and, of course, maintenance operations. The company’s strong local presence ensures that all service needs are met locally. Siemens maintains service centers in offshore key regions around the globe, in the USA, Singapore, China, Brazil, the UAE, the Netherlands, Denmark, and Norway.

Rectify faults before they become failures
On an offshore drilling facility, even minor malfunctions can cause major problems and give rise to excessive costs. As a protective measure, an emergency staff of highly skilled experts is onboard every vessel.

Siemens has now conceived an alternative solution that makes better use of personnel, time, and money. Siemens Remote Services make it possible to access a vessel’s system from a remote desktop and easily solve problems as soon as they occur. It even provides the basis for comprehensive preventive maintenance, which helps keep costs for staff and spare parts storage at a minimum and prevents unscheduled downtime.