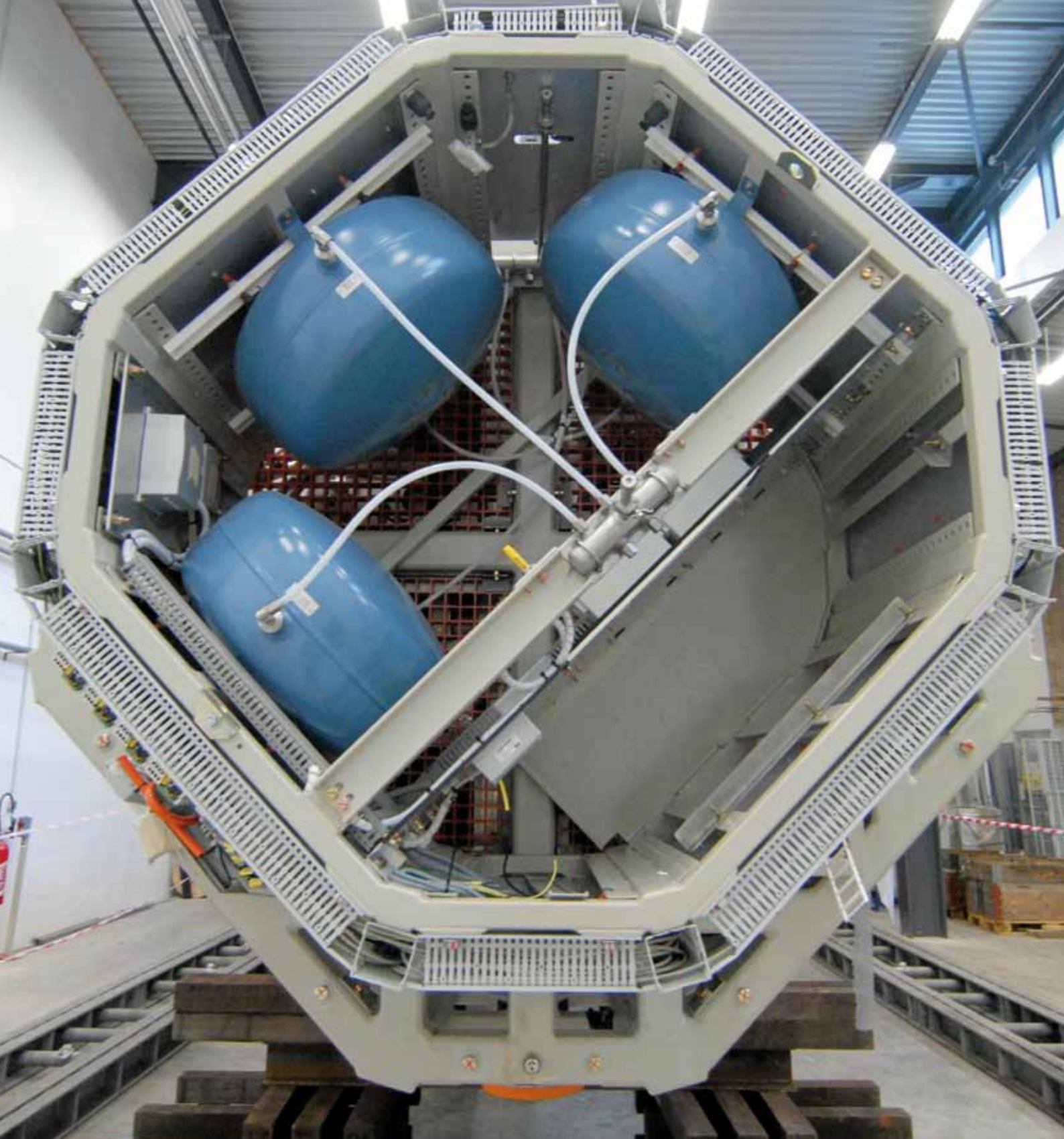




Subsea Electrical Solutions



A World Leader in Electrical Solutions

Converteam is a world leader in power conversion engineering. Building on over a century of experience, it is firmly placed at the leading edge of technology and innovation with a global reputation for excellence in the conversion of electrical energy. Converteam develops and provides solutions built around three core components: electrical machines, variable speed drives, automation and process control. It serves specialized sectors as well as its six core markets in Renewables, Power Generation, Oil & Gas and Offshore, Marine, Industry and Services. With over 5,500 staff members in 17 countries, Converteam Group provides power conversion solutions worldwide in over 80 countries with seven converter factories, four electrical machine factories and twelve engineering centers.

Electrical Solutions to Empower Subsea Processing

Converteam is a world specialist in power conversion engineering offering its customers optimal, customized and value-added electrical solutions. With an acknowledged experience within the Oil & Gas industry, Converteam has inherently extended its offer into electrical solutions to energize subsea processing applications, with landmark references in the Oil & Gas and Subsea industries.

Giving customers the best of our expertise and experience

Converteam has over a century of acknowledged achievements and technological breakthroughs in power conversion. As a technological and innovative company, Research and Development has always been at the heart of our concerns. We have demonstrated interest in the subsea field for more than a decade, and our expertise has been acknowledged in the course of various development programs and design projects aimed at ensuring the success of production enhancement initiatives.

Choosing an all electrical power solution

As mature wells lose pressure, increased recovery projects require additional pumping or compression to extract the extra quantity of hydrocarbons. Such equipment is traditionally installed on a platform or onboard an FPSO. The interest in full subsea systems has come about as a result of operations in deeper water and where the wellhead is far away from a surface production facility. Subsea process templates comprising of pumping or compression systems invariably require an electrical driving system.

The choice of an all electrical solution is also related to the total installed cost of a subsea processing application which is considerably less compared to a topside facility. Our all electrical systems offer the operator the benefits to implement subsea compressor and pumps close to the wellhead, resulting in low maintenance, lower capital expenditure costs and optimized power consumption.

From an operating point of view, subsea solutions offer the benefit of continuous and safe operations despite adverse climatic conditions such as hurricanes or ice.

A unique engineering approach

Subsea projects require a high degree of tailoring to the oil or gas industry needs. The capabilities of Converteam perfectly suit these engineering flexibility requirements. First, Converteam collaborates with its customers in choosing the most adapted technical solutions. Then our specialist teams design tailor-made systems based on our proven technological solutions.

Reliability at the heart of our solutions

Equipment reliability is essential for any subsea installation. And reliability is the cornerstone of Converteam's electrical subsea solutions. Our equipment is built around proven technologies developed over several years and optimized by our teams. As a consequence, Converteam's capability to design maintenance-free systems is recognized industry-wide.



| Circuit breaker module rack for the Ormen Lange pilot station

Reliable Power Solutions for all your Subsea Needs

With more than 30 years of experience in power conversion for Oil & Gas projects, Converteam provides Variable Speed Drive Systems, electrical motors and Power Management Systems for the most demanding subsea applications.

A complete scope of supply

To meet the performance criteria with the highest availability, electrical systems must be carefully designed from the connection point to the grid to the driven equipment coupling. Therefore, Converteam's scope of supply is not limited to the drive and motor assemblies.

As a power conversion company, Converteam can provide the integrated electrical system including motors, converters, transformers, switchgear, UPS (Uninterruptible Power Supply), distribution panels with their associated enclosures, automation systems, and the necessary studies to ascertain a system to be completely reliable.

Converteam has, over many years, developed considerable experience within electrical power systems. Most of our deliveries are specifically engineered and adapted to suit our customer's needs and specifications.

A relevant equipment offering

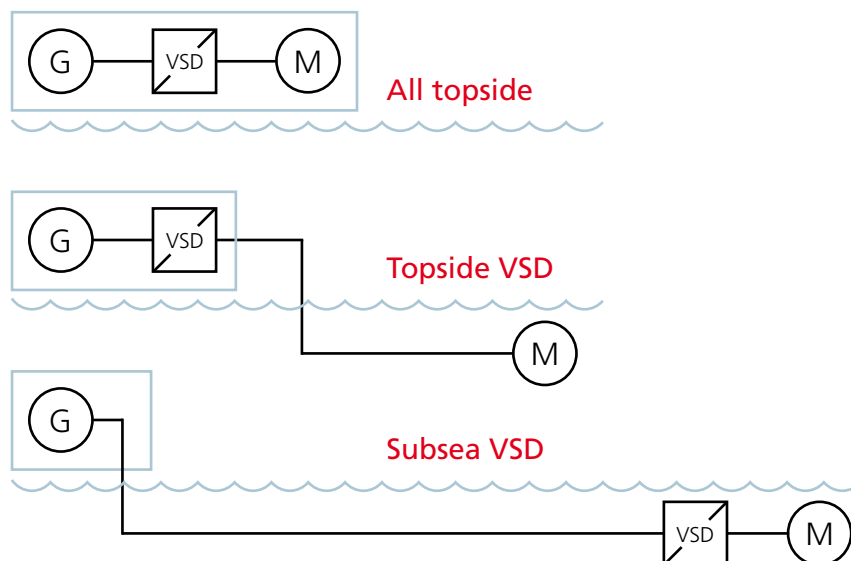
Our equipment offering is based on experience and the projects we have dealt with in the past years. Converteam is able to analyze any need with an in-depth understanding of its customers processes. As a result, Converteam can match any plant configuration.

In response to our customer's preferences, we can design:

- Topside systems to be installed aboard a floater or on a platform
- Subsea units to be integrated into the customer's enclosures
- Complete subsea units in Converteam designed enclosures.

Applications, topside or subsea

- Multi-phase pumps
- Gas injection compressors
- Gas export compressors
- Water injection pumps
- Re-injection pumps
- Water or gas injection boosters
- Sea water lift pumps
- Electrical submersible pumps
- Crude oil export pumps



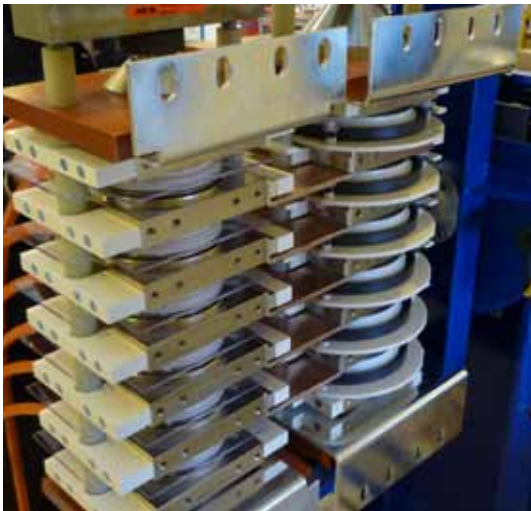
Expert Teams

for a Long-Term Partnership

Converteam is your single source supplier with single source responsibility. We offer the unique benefits of a fully integrated package of electrical power and control systems, supplied from one reliable source. Converteam's project management helps coordinate and integrate all associated equipment according to the individual customer's needs.

Customized technology

Converteam analyzes the project requirements in close cooperation with the customer and suggests optimized solutions. Converteam's specialists contribute with their expertise to ensure optimum process performance in compliance with international standards for electrical equipment.



A dedicated team

Converteam assigns a dedicated management team to every project through all phases from initial design to final installation. We design, supply and integrate the different electrical components and can perform routine and full-load tests on our factory premises.

A long-term partnership

Converteam's strategy is to develop interactive relationships based on a long-term commitment policy:

- Define the right technical solution offering optimum benefits to its customers
- Be open to new solutions and methods with no compromise on safety or reliability
- Provide efficient and high quality services
- Do business in an ethical manner.

A lasting commitment to service and support

The Converteam service organization is dedicated to comprehensive customer support during all product lifecycle phases including spares and repairs, routine service contracts, 24/7 support, upgrade and enhancement projects, remote diagnostic and training.

In addition to supporting customers through its engineers in the field, Converteam has a global network of Regional Business Centers (RBC). These RBCs, backed by specialists from our service centers, R&D and engineering divisions, offer a combination of expertise, proximity and effective responsiveness to customers around the globe.



Customized Drives based on Proven Technologies

Thanks to its leading position in the power conversion business, Convertteam has developed a complete set of solutions based on proven technologies and has acquired an unsurpassed know-how in Variable Speed Drive solutions.

The MV7000 high power medium voltage drive offers outstanding performance and excellent reliability with a very compact design. Based on powerful press-pack IGBTs, the MV7000 medium voltage drive often eliminates the need for filters and never requires power factor correction.

The MV7000 has the advantage of a minimal component count and is configurable for the high packing density required for subsea applications.

Associated with Convertteam's MGV high-speed motor range, the MV7000 drive is particularly well adapted to gearless applications for gas compression.

The MV7000 drive is modular and offers several different options, such as regenerative front ends and DC bus connection. The MV7000 is either water or air cooled. This drive is suitable for induction motors, but also for synchronous motors, with dedicated high performance vector control, in all speed ranges from low-speed reciprocating to high-speed centrifugal compressor drives.

Using the latest generation of press-pack IGBTs with more active power and lower losses, the MV7000 is a world-class drive in terms of reliability, efficiency and power density. It features a 3-level inverter with adjustable Pulse Width Modulation (PWM) providing:

- Excellent output waveforms
- Very low motor current harmonics
- Operation at very low frequency and full torque
- Operation at high frequency up to 300Hz.



| A press-pack Insulated Gate Bipolar Transistor (IGBT)

MV7000 capabilities

- Up to 100MW at motor shaft
- To drive induction or synchronous motors
- Voltages: 3.3, 4.16, 6.6, 9.9 and 11.0kV



| MV7000 Variable Speed Drive

Innovative Motors based on Unique Expertise

The Converteam high-speed motor is another proven technology which makes the difference in subsea compression.

Pioneer in the development of high-speed solutions

Converteam is a pioneer in the development of high-speed electrical motors. A series of induction motors has been specially built to meet the most demanding requirements of compressor systems with regard to speed and capacity. Our high-speed drive solution now allows direct connection of induction motor and compressor, eliminating the need for a gearbox. This results in an unrivaled improvement in overall drive system efficiency.

With the capability to operate up to 20,000rpm, the weight and dimensions of the complete unit have been significantly reduced. In addition, the use of magnetic bearings eliminate the optional oil lubrication systems for motors and compressors, thereby reducing maintenance costs.



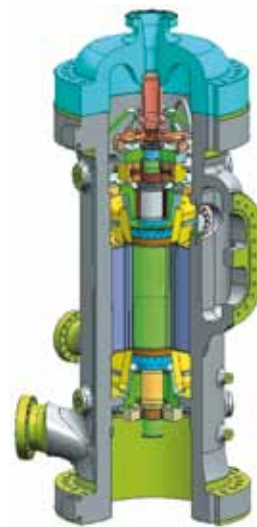
| An unrivaled high-speed rotor design

Integrated motor-compressors

The high-speed induction motor and the compressor are installed inside the same pressurized casing directly connected to the gas pipeline. A portion of the gas is used to cool the motor. No gearbox is required. With magnetic bearings, the installation is completely oil free. The integrated concept is environmentally friendly, and emission-free. This arrangement is perfectly suited for gas compression in subsea applications.

The Converteam high-speed motor in a subsea compression package

Converteam manufactures high-speed motors up to 25MW engineered to meet the complex operating subsea conditions. A key design feature is the patented laminated squirrel cage rotor which is very reliable, efficient and tolerant to harmonics. This proven rotor technology guarantees very low vibration levels and consequently a longer lifetime of the complete system.



| High-speed subsea compressor motor

A long experience in high-speed direct drive solutions

- Over 20 years of experience in high-speed motors
- In excess of 100 worldwide references since 1992
- More than 4,000,000 cumulated running hours

High-speed benefits

- Smaller footprint
- Very high reliability: MTBF = 100,000hrs
- Fire safe, no lubrication auxiliaries
- Higher overall efficiency
- Noise reduction by half



Low and Medium voltage motors for pumps and compressors

Converteam has more than a century long experience in the design and manufacture of AC motors. Our range of machines includes all types of electrical motors for all types of onshore, offshore and subsea applications. Offering a high degree of customization, different enclosure designs are possible. The cooling system can be adapted to the different industrial environments; totally enclosed, fan-cooled, with or without heat exchangers, air-to-air, air-to-water.

Prestigious References

Drives for Topside and Subsea Motors



| 9.6MW induction motor for topside

CLOV scope of supply

- Two converters feeding subsea Multi-Phase Pump induction motors rated at 2.3MW through 11km umbilicals
- Five complete Variable Speed Drive Systems including induction motors for the main gas compressors
- Two complete Variable Speed Drive Systems including induction motors for the water injection pumps

CLOV: the first full electrical FPSO

The CLOV project is the fourth development pole in Angola's deep offshore Block 17. This is a stand alone development of a four-field cluster. This is a premiere project, as it is the first FPSO with all electrical driven equipment.

Converteam supplies converters installed on the CLOV FPSO which feed subsea Multi-Phase Pump induction motors on the seabed. On the same FPSO, Converteam supplies electrical variable speed drives and motors for process compressors and water injection pumps. The total electrical power is about 50MW.

After being ordered for the 12MW export gas compressor on the OFON platform in Nigeria, the Converteam MV7000 solution was again selected on CLOV, a project also operated by Total.

Associated with a set of high performance induction motors, our drive solutions are optimized in terms of maintenance and space savings which were key design features for the customer.

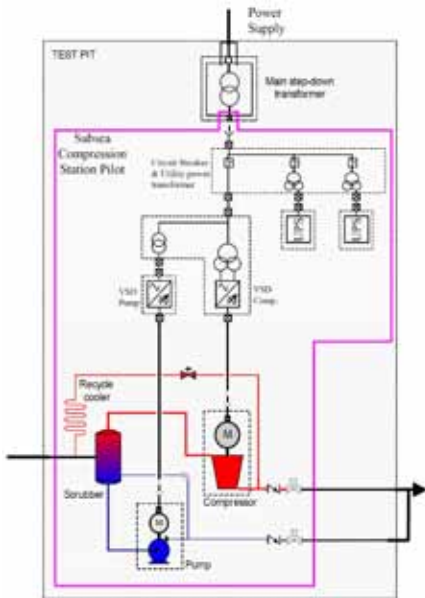
Delivery of the systems will begin in 2012 and the equipment will enter into operation in 2014.

Prestigious References

Full Subsea Applications

A groundbreaking project: the Ormen Lange pilot station

Ormen Lange is a gas field located 120km off the northwest coast of Norway in water depths between 850 and 1,100 meters.



Single Line Diagram

In 2007, Converteam signed a contract with Aker Solutions for the engineering, manufacturing and test of the prototype electrical package for the Ormen Lange subsea gas compression station.

The planned subsea compression at the Ormen Lange field will include four parallel compressor trains, functionally identical to the current pilot. The pilot is a 12.5MW package that includes a high-speed motor (MGV) and a medium voltage/high-power drive capable of operating 900 meters below sea level, reliably and maintenance-free for a minimum of five years.

Converteam meets design constraints such as:

- Target of 10 years with no maintenance
- Tolerance to earth fault

- Minimal size due to weight and 100bar pressure requirements
- Minimize the number of subsea interconnections.

The highest challenges our engineering teams overcame were to fully “re-shape” the already available validated solutions to fit subsea environment mechanical requirements. We had to also restrict losses to keep an acceptable temperature without fans in hermetically closed enclosures. Our equipment had to be designed to be resistant to transportation shocks and vibration.

The pilot is now installed in a test pit at Nyhamna, Norway and will be tested for qualification until December 2012.

Ormen Lange Pilot scope of supply

- Compressor VSD: 10.5m high with a diameter of 3m, 12.5MW output
- Pump VSD: 5.6m high with a diameter of 2m, 450kW, intended for liquids boosting
- Two UPS units: 8m high with a diameter of 1.5m, for backup power of the compression train auxiliaries
- Circuit Breaker unit: 18m long with a diameter of 2.6m
- A 12.5MW high-speed motor at 10,400rpm



Compressor Frequency Converter, Ormen Lange pilot station



Pump Frequency Converter, Ormen Lange pilot station

A Complete Offer in the Oil & Gas Industry...

Besides subsea applications, Converteam serves the Oil & Gas industry with highly innovative electrification solutions utilizing rotating machines, power electronics and automation systems for pumping and gas compression. Converteam is a leader in this field.

Converteam solutions can be applied throughout the complete process, from upstream to downstream:

Exploration and production for onshore, offshore (FPSO + fixed platforms) facilities including:

- * Drilling
- * Enhanced recovery
- * Gas and oil separation
- * Pumping
- * Gas lift and export
- * Multi-phase pumping
- * Gas treatment

Transportation and Storage, including:

- * Gas liquefaction plants (LNG, FLNG)
- * Onboard boil-off reliquefaction
- * Gas pipeline stations
- * Oil pipeline stations
- * Gas storage stations
- * Re-gasification plants

Refinery and petrochemicals, including:

- * Refinery processes
- * Ethylene production (steam-cracking)
- * Polyethylene production
- * Gas to liquid



| LNG Carrier for Knutsen OAS



| GDF-SUEZ Chémery gas storage station



Power Management System

Converteam offers complete automation systems designed to provide control over the power network requirements of large industrial plants.

The primary purpose of our Power Management System is to manage the vital functions of the electrical system to ensure maximum availability of power under normal and abnormal circumstances.

To help operators analyze and control the electrical system of a plant, our system provides an ergonomic and efficient operator interface.

Our Power Management System is designed to communicate with all equipment provided by the different transmission and distribution suppliers.

...From Upstream to Downstream Onshore and Offshore

Solutions for offshore environment

Converteam also provides offshore platforms, FPSOs, drilling rigs and service vessels with a complete set of solutions and products based on variable speed drives, motors and generators combined with a detailed knowledge of process control and equipment packaging required for the offshore market:

Vessel control systems

With extensive experience in automation, control and monitoring systems, Converteam can offer vessel control systems which give coherence to the variety of electrical equipment inside a power plant and which ensure smooth operation.

Dynamic Positioning and automation systems

As a world leader in the provision of Dynamic Positioning (DP) systems, Converteam is the only supplier capable of fully integrating the DP system with the power, propulsion and automation systems on a common platform. In addition to integrated solutions, Converteam provides stand-alone DP systems for the complete range of offshore vessels.

Power and propulsion systems

Converteam's extensive experience in the provision of power and propulsion systems for offshore vessels extends over many years. With a global attitude

towards customer projects, first-class support is provided at all phases of the project and at the appropriate location.

AC drilling and control systems

Converteam is a leading supplier of AC drilling and control systems providing switchboards, rectifiers and drives. All systems share a common power and can be integrated into a common control system.

Field/Offshore generators

Converteam provides generators among the lightest, smallest and most efficient in their class. From fundamental research and development, through design, manufacture and supply to installation and lifetime support, Converteam provides 4-pole generators for gas and steam turbines and multi-pole generators for diesel and gas engine.



| DP system for Eastern Shipbuilding Group

Chinese heavy lift positions itself with Converteam

China Offshore Oil Engineering Co., Ltd. (COOEC) has awarded Converteam a contract for an integrated package of electrical systems to power two main propellers and five maneuvering thrusters of their newbuild heavy lift vessel for offshore Oil & Gas exploration and development. This 219m long 50,000dwt semi-submersible self-propelled vessel features an open deck area of over 7,500m², larger than a standard football pitch. It requires pinpoint positioning and maneuvering capability. Converteam will deliver control systems based on its C-Series range, including a DP2 Dynamic Positioning control system, and a fully integrated vessel control and monitoring system.

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