Optimizing your overall performance

Automation products and systems for the oil & gas industry

Totally Integrated Automation

www.siemens.com/oilandgas
Maximum competitiveness over the long term
Challenges for the oil and gas industry are immense, particularly in the face of the rapid, inexorable rise in the world population and constantly increasing environmental and efficiency requirements. This has created a demand for maximum yield of high-quality, safe and environmentally friendly products capable of fulfilling the market needs of today and tomorrow – with minimum power input and personnel effort.

**Totally Integrated Automation**

Totally Integrated Automation stands for the efficient interoperability of all automation components. The open system architecture ensures that all automation components work together optimally, due to consistent data management, global standards, and uniform hardware and software interfaces.

The result: optimum preconditions for enormous cost savings, faster time to market and greater flexibility. Even at the engineering stage, users already benefit from systematic minimization of time, cost and effort. This holistic approach ensures high-level project quality, as well as maximum efficiency in engineering.

**Totally Integrated Power**

Efficient, reliable, safe: These are the demands placed on electrification and especially power distribution. Our answer – for all application areas of the energy system – is Totally Integrated Power (TIP). Based on our comprehensive range of low and medium voltage switchgear, it is rounded out by our support throughout the entire lifecycle. Smart interfaces allow for seamless linking of the distributed control system and energy automation, making it possible to fully exploit all of the potential of an integrated system.

**Siemens: expert partner for the industry**

Siemens has a proven reputation for reliably delivering perfect products and systems for the oil and gas industry. With our expertise, we help to support today’s offshore and onshore installations, put efficiency into the pipeline and optimize processing and refining. Our world-class portfolio ensures highest monetary value for emerging processes and applications. We help your company achieve its goals in the best, fastest and most profitable way possible. With our portfolio, we make a significant contribution toward helping you find new and existing potential to fully exploit.

Our comprehensive product portfolio is rounded off by a suite of engineering software tools supporting the complete lifecycle from FEED to detailed design, commissioning, maintenance and service. Ensuring at all stages of your project that you have accurate as-built documentation while, at the same time, reducing engineering lead times and minimizing human errors.
Exploit the full potential of your operations

Integrating your processes to perform better

Siemens is the ideal partner for addressing the ever-increasing challenges of the oil and gas industry. We are committed to helping companies reach their goals in the fastest and most profitable way possible. Our portfolio can significantly contribute to exploring new opportunities – and fully exploiting the potential of existing ones.

Floating production, storage and offloading vessels
With the move to ever deeper waters in search of oil and gas, floating production, storage and offloading vessels (FPSOs) have become a cost-effective alternative to expensive offshore platform installations. FPSOs can be relocated once an oil field has been depleted. That’s why they can also be used economically in smaller oil fields that will be exhausted after a few years.

We offer a portfolio that covers all of the main applications for an FPSO, over its entire lifecycle. This comprises control and automation systems complete with emergency shutdown and fire & gas systems as well as instrumentation packages. Our comprehensive automation portfolio is based on the market leading SIMATIC hardware and software, which offers the possibility to integrate process control and safety applications into a single platform. It is ideally suited for use as an ICSS (integrated control and safety shutdown system) commonly found on FPSOs. Our offering is also expandable to encompass integrated operations that combine control and engineering functions, both on board the FPSO and remotely at an onshore location. This leads to more transparency, faster decisions of a higher quality, greater productivity and safer production.

Offshore drilling
Offshore drilling is a very important component of the fossil fuel production mix. However, the days of easily accessible oil and gas fields are numbered. Stakeholders involved in offshore and subsea exploration and production of oil and gas are having to move to harsher environments that require them to contend with tougher operating conditions, greater technological challenges and increased risks.

Our unique and comprehensive portfolio for offshore drilling covers the entire lifecycle of equipment and assets, thus ensuring long-term reliability and investment protection. Moreover, thanks to long-standing business partnerships with leading shipyards, naval architects and drilling service operators, we thoroughly understand the needs and demands of the market – and how to deliver tailor-made solutions. Our global organization provides support for our complete portfolio, and right where our customers need it. The scope of supply covers all areas from conceptual development and decision-making to the entire lifecycle of the technology deployed, making it easier for all of the stakeholders in offshore drilling to capitalize on their strengths, and to keep risks to an absolute minimum.
Totally Integrated Automation: advantages for plant operators

Our range of products and services is specifically tailored to your requirements. A top priority is placed on integration, openness and asset management – in all key areas from automation to drives, including the process instrumentation. Our portfolio is based on proven industrial standards and designed to achieve the highest possible degree of economic efficiency throughout the entire lifecycle of a plant.

Totally Integrated Automation: advantages for EPCs

As an EPC contractor, you must respond to continuously rising competitive pressures. The demands that you have to meet are growing increasingly complex. With Totally Integrated Automation, you benefit from:

- Lower engineering and construction costs
- Complete product portfolio from a single source for easier integration
- Shorter time to start-up – from planning to commissioning
- Higher productivity, flexibility and product quality

Oil and gas pipelines

Totaling some 3.5 million kilometers worldwide, oil and gas transmission pipelines are among the largest physical infrastructures operated by man. In order to ensure maximum operating efficiency, safe transportation, minimal downtimes as well as meet environmental and quality standards, pipelines need to be constantly and reliably operated and monitored.

We offer a comprehensive portfolio for the complete pipeline – all from a single source. Our products, systems and services are available in a wide range of ratings and configurations to address the stringent needs of oil and gas transmission. They are designed to support pipelines with ultimate dependability and to integrate operations for superior manageability, safety, reliability and efficiency. We thereby help customers reduce risks and increase delivery reliability. In the field of process instrumentation and analytics, for example, we offer state-of-the-art devices that provide operational data directly from the systems along the pipeline. The data provided by the instrumentation is collected in RTUs based on our SIMATIC hardware platform. These in turn are connected to the pipeline control center(s) with a SCADA (supervisory control and data acquisition) system from our TeleControl range. This enables the operations control system to run the facility with optimum productivity and efficiency. Innovative design, excellence in engineering, maximum lifetime value as well as compliance with health, safety, environmental and industry standards are common denominators for our entire portfolio. Moreover, through our global manufacturing and service network, we can offer local content while maintaining customer proximity.
Maximum engineering and operational efficiency

Efficient engineering is a decisive lever to counter the increasingly intense global industry competition, along with the enormous cost and time pressures. This process step determines the total costs of a machine or plant, as well as its operational efficiency.

COMOS plant engineering software

COMOS is a truly unique and comprehensive software solution for the integrated management of plant and project data. It helps companies rise to the challenges of the dynamic market environment in the oil and gas industry.

COMOS stands for efficient engineering and management throughout the entire plant lifecycle. From the initial planning phase to the basic and detailed engineering, operation, maintenance and modernization, it manages all plant data, including the corresponding documentation, on a single integrated data platform. Up-to-date information is available for the user at any time and in any place. The object-oriented concept of COMOS ensures that each process and piece of equipment is only archived once in a secure, central database. All relevant engineering and lifecycle data as well as documentation are directly linked to this object. The open software architecture facilitates optimum integration of third-party systems. Data can be exchanged with open standards such as XML and ISO 15926, ensuring easy integration into existing electronic data processing landscapes.

Integrated engineering with COMOS and SIMATIC PCS 7

Combining the planning and engineering of COMOS with our distributed control system (DCS) SIMATIC PCS 7 allows you to merge data from parallel working processes and workflows. At the touch of a button, the entire plant structure can be generated by the control system from the plant data. The availability of all plant data and as-built information simplifies decision-making and supports modern, cost-optimized plant management. Through the consistent flow of data, specific requirements of plant engineers and operators, management and partners are fully met – throughout all project phases.

A leading DCS of the oil and gas industry: SIMATIC PCS 7

SIMATIC PCS 7 stands for highest plant availability, human, plant and environmental (HSE) safety and lowest maintenance and service costs. With its unique scalability of up to more than 120,000 I/Os and high performance archive for process values, it is ideally suited for all types of large oil and gas projects and the control of process skids. Safety and fault-tolerant systems as well as comprehensive IT security are fully integrated in SIMATIC PCS 7 to reliably protect personnel, the environment, processes and plants. The integrated alarm management system is a further performance feature for ensuring safe and cost-effective plant operation. It focuses on essential alarms, allows selective operator prompting in exceptional situations, and consistently contributes toward improving the speed of accurate decision-making while also reducing operator stress.
Virtualization
In an effort to reduce administration and maintenance costs, the automation world is increasingly turning to virtualization and to the opportunities it provides for decoupling applications from hardware. SIMATIC PCS 7 can be used in virtual environments for both client and server applications. Our engineers can support you with the virtual installation of PCS 7. We also offer preconfigured hardware and software packages that enable you to explore the possibilities of virtual installation.

Distributed I/O for hazardous areas
The SIMATIC ET 200iSP distributed I/O system is an economical solution for areas subject to explosion hazards; sensors and actuators can be located directly in Zones 0 and 20, and the intrinsically safe, modular I/O station mounted directly in the hazardous area, thereby eliminating the need for an additional explosionproof housing. Typically used in production facilities of the process-industry, it offers optimum integration into PCS 7.

The new controller optimized for process automation applications
The CPU 410-5H covers all applications and performance ranges with a single hardware and firmware platform and furthermore can be upgraded online. It is designed for plants equipped with the latest versions of SIMATIC PCS 7. The controller specifically meets the demands of process automation applications, both technically and commercially. In daily round-the-clock continuous operation, it can withstand extreme temperatures, vibrations and EMC impacts. The PCBs and electronic components have a special coating that provides increased protection against environmental influences as well as additional operational safety and plant availability.
Telecontrol for efficient remote plant supervision

In the oil and gas industry, plants often cover huge areas. In these cases, it is necessary to integrate outstations for monitoring and controlling very remote units (usually with a small or medium degree of automation) with the control system of the complete plant. This is carried out by means of telecontrol protocols via remote networks (wide area networks – WAN).

Efficient solutions for telecontrol demands

Our broad telecontrol portfolio provides intelligent answers to growing demands for increased availability and efficiency. With our highly durable, secure and migration-capable telecontrol technologies, monitoring and controlling automated plants in remote locations becomes easy.

**SIMATIC PCS 7 TeleControl** integrates external stations into SIMATIC PCS 7. The central and remote automation practically share the same operating philosophy and alarm characteristics while also providing the same degree of redundancy for controllers, fieldbus and process I/Os.

**SIMATIC WinCC Open Architecture** is a SCADA system for visualizing and operating processes, production flows, machines and plants for all types of business. Distributed systems enable any number of stand-alone systems – from 2 to 2048 – to be linked via a remote network.

Overview of key TeleControl support protocols

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<th>Protocol</th>
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Process safety for maximum availability and flexibility

The production and processing of potentially dangerous materials and mixtures is common practice in the oil and gas industry. A fault or failure could have disastrous consequences. Potential hazards to personnel, plant and the environment must be kept to a minimum, without adversely affecting production processes.

All kinds of protection with Safety Integrated

With Safety Integrated for process automation, Siemens provides a comprehensive range of products and services for safe, fault-tolerant applications with a high level of availability – everything from safe instrumentation to safe, fault-tolerant control and actuators, for example, positioners.

Our broad safety portfolio is best exploited in conjunction with SIMATIC PCS 7 and its uniform configuration of basic process control and safety functions with CFC. Thanks to the modularity and the flexibility of our safety-related products, they can be combined with standard hardware in a single I/O station. Not only the degree of integration for safety-related systems can be individually defined in the SIS, but also the degree of redundancy for controllers, fieldbuses and process I/Os – with Flexible Modular Redundancy.

With the Safety Matrix, we also provide an intuitive tool for configuring safety systems based on a cause and effect method. It enables faster yet, nevertheless, safe engineering of your process safety applications.

Certified assurance with Safety Instrumented System

A Safety Instrumented System (SIS) is a combination of sensors, logic solvers and final elements that automatically takes an industrial process to a safe state when specified conditions are violated. As a reliable industry partner for more than 20 years, we provide safety certified products and services for SIS applications in compliance with standards such as IEC 61508 (to SIL 3, also with a single CPU), ISA S84, EN 54, NFPA 85 and IEC 61511.
Making processes safer with Industrial Security

Excellent data defense at every level

Safeguarding critical and sensitive data against unauthorized access, loss or theft is of fundamental importance for the success of virtually all businesses. Keeping your guard up in the information age means keeping one step ahead of potential data security threats and attacks. That’s precisely what Siemens Industrial Security solutions are designed to do.

Assurance at all levels
Based on the Defense in Depth concept, Siemens Industrial Security solutions provide protection at all organizational levels. In terms of plant security, it blocks network and critical component access to unauthorized persons. Network security is protected with controlled interfaces between the office and plant network, for example, with firewalls. System integrity measures include antivirus and whitelisting software, maintenance and updates, user authentication for plant and machine operators as well as integrated access protection mechanisms within automation components.

Five key points of protection
As a comprehensive security approach, Siemens Industrial Security focuses on five key areas, starting with the implementation of the security management system. All of the interfaces are subject to strict security regulations and are regularly monitored accordingly. In addition, all PC-based systems are protected. The same applies to all control level systems. Finally, all communication is monitored and can, if needed, be segmented.

The structured Siemens Industrial Security approach is rounded off with the independent certification of our product portfolio by the internationally recognized organization Worldtech.

Siemens Industrial Security approach
Implementation of security management
The interfaces are subject to regulations – and are monitored accordingly
PC-based systems must be protected
The control level must be protected
Communication must be monitored and can be segmented
Advancing your oil and gas applications

Enormous competitive pressures are forcing machine builders and system integrators to harness their entire innovation and optimization potential, also in the oil and gas industry. Latest technologies help them meet specific customer requirements and, at the same time, post healthy growth.

TIA Portal
The Totally Integrated Automation Portal (TIA Portal) is our innovative engineering framework for all automation tasks. It integrates the entire automation software into a single engineering environment, facilitating efficient planning and enabling time savings of up to 30 percent. The programming of controllers and visual components as well as the configuration of drives, networks and fail-safe applications are also integrated into the environment. Thanks to its intuitive operation, efficient engineering and proven functionality, the TIA Portal maximizes the profitability of engineering projects and increases competitive strength. Investments remain protected and project data can be reused with the TIA Portal’s new library concept.

SIPLUS extreme: tougher than the standard
With SIPLUS extreme, we offer automation products that can master the most extreme conditions: ambient temperatures from –25 °C to +70 °C, condensation, increased humidity, higher levels of mechanical stress, extraordinary load due to pollutant gas or dust contamination exposure, voltage ranges differing from the standard or increased degrees of protection. SIPLUS extreme is perfect for sectors with particularly “extreme” requirements.

SIMATIC S7 modular controllers
Our SIMATIC S7 modular controllers are especially designed for ruggedness and long-term availability. They can also be used as fault-tolerant or fail-safe systems, and flexibly expanded at any time using plug-in I/O, function and communication modules. Depending on the application, we offer a wide selection of controllers designed for performance, quantity frameworks and communication interfaces.

Our latest highlights
SIMATIC S7-1200 is extremely flexible, scalable and integrates seamlessly into Totally Integrated Automation. It works perfectly together with HMI, I/O, drives and software.
SIMATIC S7-1500 is the latest generation of controllers in the TIA Portal and marks a milestone in automation. It ensures highest efficiency and maximum usability for medium and complex applications in machine and system automation.
Cost-saving solutions from a single source

Our applications portfolio extends across the entire oil and gas value chain. Being one of the few companies to offer products and services for all areas of the industry, we work closely with customers to develop cost-saving, integrated solutions as a single source supplier.

Fire and gas detection

Controller-based, fully integrated fire and gas detection and extinguishing systems are rapidly gaining popularity in a number of industries, most notably oil and gas. Using controllers for these systems offers additional flexibility and data communication options, with the controller providing the necessary functionality and an operator interface supporting smooth interaction with the system.

We designed our fire and gas detection system on the basis of extensive field experience gained through worldwide oil and gas projects over the past 20 years. The main components are certified by TÜV for use in applications up to SIL 3/AK 6 or SIL 2/AK 4 in single mode configuration. This is supported by a high level of self-diagnosis and by the fail-safe design principle. Depending on the configuration, hardware and software solutions are scalable from SIL 0 (normal availability) to SIL 3 (high availability).

In addition to hardware components certified for SIL 3/2, the entire software implementation and hardware design concept performs according to IEC 61508, SIL 1 to SIL 3. Furthermore, it enables communications with other systems to SIL 0, SIL 2 or SIL 3, or multi-point communication via PROFIBUS and Ethernet. Our fire and gas detection system operates totally independently of other control or operator systems. In addition to increased availability and reliability, the systems can be configured as fully redundant systems.

Remote terminal units

Remote terminal units (RTUs) connect to sensors within the process and convert sensor signals into digital data. Their telemetry hardware is capable of sending as well as receiving digital commands from the supervisory system. RTUs often have embedded control capabilities such as ladder logic that enable boolean logic operations.

We offer controllers that can be used to implement safety-related applications on-site and that automatically set the plant into a safe status in the event of a dangerous fault. Even tolerant controllers and safety-related RTU applications can be realized.

Our globally proven communication modules e.g. (TIM) handle the data exchange between remote systems and the master system. They also provide a wide range of comfortable telecontrol functions like subscriber monitoring, redundancy of transmission paths, cross communication and remote engineering in parallel to normal data communication – independent of the network used.
Industrial communications for harsh environments

Efficient infrastructures and networks enabling company-wide industrial communications are indispensable for all types of automation solutions. These can only be implemented on the basis of communication standards such as IEC 61850 & IEEE 1613. Our SCALANCE and RUGGEDCOM network products meet all of these requirements, ensuring a high degree of openness and flexibility.

**Highest efficiency based on proven standards**

Our comprehensive product portfolio for plant-wide industrial communications within Totally Integrated Automation (TIA) relies on international, cross-vendor standards that are mutually compatible. It ensures maximum communication consistency, regardless of whether the topology is wired, wireless or remote. What’s more, it establishes the requirements needed for maximizing planning flexibility, implementing optimal network infrastructures and minimizing costs.

Engineering, commissioning, operation and maintenance are significantly accelerated and simplified with this plug-and-play concept. Integrated network communication is standard with all of our automation components. As such, they create the basis for the efficient interoperability of all components and facilitate the management of the entire network infrastructure.

**Maximum reliability under extreme conditions**

Reliable communications and secure transmission of business information are critical to the oil and gas sector. Based on international standards such as IEC 61850 and IEEE 1613, our SCALANCE and RUGGEDCOM network products are purpose-built to withstand harsh conditions involving electromagnetic interference, extreme temperatures and remote locations. They address the unique challenges facing oil and gas production companies with reliable, high-performance communication infrastructures. Our portfolio offers customers a comprehensive range of world-class products for fully integrated network infrastructures that can be quickly deployed and are all from a single source.
Process instrumentation for extreme conditions

Precise and reliable process instruments are indispensable for all industrial processes – especially in the oil and gas industry, where unconventional methods of extraction under difficult conditions are increasingly commonplace. This fact alone makes safe and efficient process instrumentation extremely important.

One-stop shop for wide-ranging applications
Our portfolio of process instrumentation fulfills a broad range of oil and gas industry needs. For all product groups, we offer instruments that are certified according to national and international standards. Our products can be seamlessly integrated into control systems. They are the result of decades of process instrumentation experience and industry-specific knowledge of exploration and production, transportation, storage and refining needs.

Pressure measurements
Our comprehensive portfolio of accurate and certified pressure transmitters measures absolute, gauge, differential and hydrostatic pressure for level, flow, pressure and head loss applications. They are an excellent choice for topside wellhead control and hydraulic power units, flow measurement with orifice plates and feed water applications.

Flow measurements
Our selection of flowmeters meets the toughest challenges and covers a wide variety of applications. Highly accurate and reliable, the electromagnetic, ultrasonic, vortex and Coriolis devices measure and monitor the flow rates of gas, steam and liquids with varying consistencies. Our clamp-on flowmeters are ideally suited for flow measurements of hydrocarbon liquids and natural process gas applications.

Level measurements
For both continuous and point level measurements, we offer a comprehensive range of ultrasonic, radar, guided-wave radar, capacitance, hydrostatic, differential pressure and electromechanical level measuring technologies.

Temperature measurements
Our SITRANS T family comprises head, rail and field temperature transmitters that support all common RTDs, thermocouples, resistance and millivolt sensors as well as specific sensors for all applications. The sensors are well suited for a wide spectrum of measuring tasks, even in very harsh environments.

Valve positioner
The SIPART PS2 electropneumatic valve positioner offers extensive diagnostic functions with minimum process air consumption. Easy to install, it enables operators to accurately and cost-effective control typical applications.

WirelessHART
Our WirelessHART portfolio includes adapters for integrating various field devices as well as a gateway. Users not only benefit from significantly improved process diagnostics, productivity and security, but lower total cost of ownership.
Process analyzers play a central role for business success in the oil and gas industry. They make a vital contribution to process and quality optimization while also enabling environmentally conscious and sustainable production.

**Comprehensive portfolio from a single source**

Our broad and innovative process analytics portfolio is designed to meet all user requirements for all types of products and systems. It is based on our extensive expertise in developing high-performance analytical devices and in-depth applications knowledge for many process industry applications. Together with our innovative analysis technologies, customized engineering and professional support, we are able to offer customers the right solutions for their applications – worldwide.

**Process gas chromatography**

Our process gas chromatograph portfolio meets a wide variety of applications. With the Maxum edition II, we have a product family that is perfectly suited for the refinery, hydrocarbon processing and chemical industries – from crude oil analysis to fine chemical applications. We also offer a micro process gas chromatograph, the MicroSAM, with a space-saving, field mountable design. It operates either directly or close to the sampling point in many hydrocarbon applications without extended infrastructure.

**Continuous process gas analytics**

Whether extractive or in-situ, our portfolio of gas analyzers covers a variety of physical or electrochemical measuring techniques. We provide ideal gas analyzers for any application. Our gas analysis tools can be connected to host control systems using tried-and-tested communication standards.
Industrial controls and power distribution

High-level availability and process transparency

More and more often, data from the motor feeders are integrated into the process control system. This increases process transparency and ensures a significantly greater density of information within the control system – at no extra cost.

SIMOCODE pro flexible and modular motor management

SIRIUS motor management and control devices are the first choice for constant speed motors in the low voltage range. SIMOCODE pro optimizes the connection between the control system and the motor feeder, thus increasing plant availability and enabling considerable savings in the construction, commissioning, operation and maintenance of the plant. It features an extremely compact design along with a range of graduated functions. In addition its straightforward and efficient service and maintenance concept, SIMOCODE pro meets all of the requirements for future-proof energy management, offering advantages for all areas of process and operations management as well as switchboards. Specifications include:

- Multifunctional, electronic full motor protection, independent of the automation system
- Flexible software instead of hardware for the motor control
- Detailed operating, service and diagnostics data
- Open communication via PROFIBUS DP
- Integration and monitoring of additional process values
- Detection and monitoring of power-related measurements
- ATEX certified for overload protection of explosion-protected motors

SIVACON systems for intelligent customized solutions

SIVACON systems are low-voltage communication-capable switchboards and busbar trunking systems with a high degree of flexibility and availability. They integrate seamlessly into the automation environment. Together with switchgear, we offer a common integrated communication concept, for example, SENTRON circuit breakers, the SIMOCODE motor management system and SIMATIC. SIMOCODE pro can be used in SIVACON low-voltage master control centers (MCC) and enables load feeder configuration. The extremely compact load feeders provide higher performance and are capable of communicating. Thanks to their high degree of modularity, the communication components can be easily retrofitted. Innovative software products offer user-friendly local parameterization, diagnostics, operator control and visualization via PROFIBUS DP or Ethernet/Internet.
Committed
to your success

Proven excellence around the globe

As a long-time supplier and reliable partner of the oil & gas industry, Siemens supports customers around the world to effectively address their steadily growing challenges. Our commitment takes many forms, for example, unsurpassed system integration and data transparency such as that offered by Totally Integrated Automation (TIA).

Louisiana BOP manufacturer enhances performance with advanced control technology

Headquartered in Broussard, Louisiana (USA), CAD Control Systems specializes in the design and manufacture of BOP (blowout preventer) control systems used in the oil exploration industry. Providing equipment for global drilling contractors in more than 30 countries, it places a high priority on performance and safety. The company had already been working with Siemens for more than a decade, when it was approached by the latter to take part in a pilot program for its S7-1500 programmable logic controller (PLC). CAD Control welcomed the challenge.

Although it is pleased with the Siemens S7-300 PLC it is using, it saw an opportunity for improvement and was interested in exploring the potential benefits of the new product.

Customer requirements

In the oil exploration industry, performance and safety is everything, especially when it comes to BOP control. There is no margin for error or failure. The valve closes the BOP during drilling. It is a critical piece of equipment for monitoring, maintaining and managing a well, as well as for the safety of the personnel. The Deepwater Horizon incident in the Gulf of Mexico is a telling reminder of what can happen when these systems fail.

BOP control systems are unique in their ability to provide a very high volume at very high pressure in an extremely short period of time. They need to function flawlessly in highly hazardous atmospheres and explosive environments. As a minimum, the new control system also had to fulfill these requirements.

Siemens solution and benefits

Once equipped with the S7-1500 and following in-house testing, the test system was rolled out on a predetermined platform – with very positive results. The new controller saves the company time in engineering, building, wiring, designing and programming, and is expected to also allow faster troubleshooting. In addition to improving the reliability, display capabilities and wiring techniques for the tested BOP control system, the company also managed to cut product configuration and programming time through the use of the TIA Portal, the proprietary Siemens engineering software.

The pilot program gave CAD Control Systems the chance to become more familiar with the TIA Portal. It discovered many things it liked, starting with the simple way in which the software is organized. The company lauds the controller’s efficiency and ease of use, enabling savings in programming time of 10% to 15%. Its performance and reliability, the built-in diagnostic display as well as the user-friendly HMI were also very positively noted. In addition, the controller incorporates remote diagnostics and data collection capabilities. As such, it already fulfills anticipated future regulatory requirements regarding industry safety and efficiency.

CAD Control Systems has plans to expand use of the controller throughout its product line. While it currently still uses both controllers, it can very well imagine migrating complete control system portfolio to the S7-1500 in the future.
Leading Norwegian-based engineering group enters new territories with Siemens

Conceived as an alternative to conventional “ship-shaped” FPSOs, the Norwegian company Sevan Marine designed, developed and is now successfully operating completely new floating production facilities. They are based on an innovative, patented cylindrical concept with automation, control, safety, navigation and tele-communication systems – all supplied by Siemens.

Customer requirements

 Ironically, the fact that most current-generation FPSOs are shaped like conventional ships and primarily designed to efficiently move through the water with minimal resistance in one direction, also means that they are less suited for use as stable platforms. Influenced by waves and wind, they need to swing around their fixed moorings to point into the wind – an effect known as “weather-vaning.” Connected to multiple seabed wellheads through vulnerable and highly critical umbilicals, including production risers carrying crude oil or gas, excessive motion could literally prove catastrophic. To counter weather-vaning, risers are connected to a large mooring structure known as a turret through rotating swivel couplings.

Siemens solution and benefits

Sevan Marine ASA implemented an innovative solution with a favorable motion pattern designed to provide maximum stability. A contract was signed with Brazil’s oil giant Petrobras in 2004 for the world’s first cylindrical production and storage unit, the Sevan Piranema FPSO. Processing up to 30,000 barrels of oil per day with a storage capacity of 300,000 barrels and a gas injection capacity of 3.6 million cubic meters per day, the Sevan Piranema uses systems and equipment from Siemens to control all vital operations. The 3.75 megawatts (MW) of electrical power from the onboard generating plant is fed to medium and low-voltage networks throughout the vessel with Siemens transformers and distribution switchgear. Safety-critical services are backed by uninterruptible power supply (UPS) systems. Siemens also provided direct current supplies for specialized equipment and motor controls for all major electric drives. The same is true of the state-of-the-art automation systems for the process control and safety systems, including emergency shutdown (ESD) as well as fire and gas (F&G) detection and control. Standard Siemens power management and information management systems were installed together with an onboard simulator for operator training. In addition, Siemens contributed the comprehensive telecommunications equipment for CCTV, video conferencing and entertainment, radio and satellite communications, telephone, paging and public address systems, as well as the FPSO navigational aids and general administration network.
The information provided in this brochure contains merely general descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

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