Siemens PLM Software

Oil and gas

Delivering innovative, safe and reliable products and operations

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The oil and gas industry operates in a very complex environment. Large capital expenditures required to fund prospecting and production are forecasted to rise in the next 20 years in line with the demand for energy. This spike in demand will require the oil and gas supply chain to react with speed and precision while delivering the highest return on investment.

In this mission-critical industry, innovation has become a core driver. As new sources of hydrocarbons are found, new engineering methods must be created to drive growth, performance and profitability – not only for your company, but also for your customers. You need to accelerate the delivery of safe and reliable products. These goals are compounded by the fact that it now takes hundreds of decision points and parallel workflows to deliver on your product development initiatives.

Siemens PLM Software addresses these realities by providing product lifecycle management (PLM), an integrated technology platform that enables your company to flourish in this complex business environment, ensuring that you make smarter decisions that lead to better products.
Adapting to changing conditions

Oil and gas field services and equipment manufacturers are constantly challenged to adapt to new circumstances. Manufacturers face new requirements to ensure products can perform in deeper water drilling operations, oil sands or shale gas fields that require new exploration techniques and production processes.

Project timelines compress development and delivery windows, and equipment must remain operational as close to 100 percent uptime as possible. Given these challenges, the following questions become key business issues:

• How do you deliver faster, safer, more reliable oil and gas products and operations?

• How do you deal with mounting pressures to improve the operational performance of your products while meeting escalating customer and compliance requirements?

• How do you improve productivity of your product development process and extended teams so they can operate faster and deliver better and more constant product quality while minimizing lifecycle costs?

• How do you ensure a safe work environment for your employees and extended supply chain?
Seizing new opportunities

Globalization
New and emerging market opportunities have enabled the oil and gas industry to develop higher quality and more reliable products. Equipment manufacturers have responded either by following their customer base to these new markets, or by forming new global sales and service partnerships and extended value chains to support these global customers. You must deliver products in more compressed time-frames and respond to customer requests in a highly competitive global marketplace.

Optimization
Optimized performance requires smarter engineer-to-order and make-to-order processes and innovative design-anywhere, make-anywhere solutions. Accurate customer alignment and on-time product delivery depend on total visibility into the status of your initiatives, the impact of change and identification of potential bottlenecks before they result in irreparable delays. Optimization of the plan-to-production process is essential for you to manage innovation complexity.
Rapid innovation
Product innovation involves multiple work processes that require the participation of many disciplines working across organizational boundaries and collaborating with outside vendors. Continuous technological innovation and customer demand for this technology combine to place extra pressure on today’s oil and gas field services and equipment manufacturers. These pressures require you to add new features and capabilities to your products at a very rapid pace – with “little margin for error.” These time-to-market requirements and the need for quality, highly reliable products compound the complexity of today’s product and production lifecycles.

Sustainability
Sustainability is a key concern for the oil and gas industry. Sustainability means excellence in exploration and production as well as in product performance, environmental and worker safety. Innovation in sustainability means equipment with longer lifecycles that use less energy or natural resources in operation. Today’s manufacturers also want to establish a sustainability strategy to enhance their competitiveness and meet compliance requirements. All of these considerations combine to increase the complexity of product design, testing and manufacturing processes.
Enabling faster, safer, more reliable oil and gas products and operations requires innovation in product design, testing, manufacturing and service. These innovations can only be delivered with a lifecycle software solution. With industry-specific solutions from Siemens PLM Software, your company can begin the PLM journey at any step along the way, improving your productivity right from the start. These solutions ensure greater certainty in the development of your equipment and machines, resulting in shorter commissioning times and more immediate productivity. These solutions support each step in the product development process in the following ways:

- **Design:** Optimize product designs to meet customer performance and compliance requirements
- **Simulation:** Leverage analysis to ensure reliability and product performance throughout the lifecycle
- **Assembly:** Optimize the assembly process with good manufacturing assembly planning
- **Production:** Link virtual product development to the physical manufacturing environment
- **Supply:** Identify and validate suppliers from around the world
- **Support:** Energize ongoing operations and maintenance with lifecycle information

**Ensure greater certainty in the development of your projects**
Accelerate product delivery
With the help of PLM, you can deliver reliable, high-quality products more rapidly by capturing best practices re-using proven designs. Managing information and data in a structured PLM environment is an effective strategy that integrates requirements, projects, documents and process management.

A global leader in automation technologies uses PLM to speed up work processes and reduce product errors. Stakeholders gain continuous access to the latest product information. Users are enabled to make real-time changes that can be reviewed and audited.

Process standardization
PLM enables you to streamline your design and manufacturing process to improve operational performance and deliver innovative products with lower cost of ownership. You can leverage PLM knowledge capture and workflow capabilities to ensure your company’s information assets are being re-used wherever feasible.

Our customers say that PLM helps them leverage innovation throughout their organizations, delivering visibility to new ideas and technology platforms that enable them to quickly deliver products with unique improvements.

Reduce build costs
You can reduce product costs and increase product quality by virtually building and testing your equipment prior to production.

One of our customers removed non-value-added functions from its lifecycle processes and collapsed its product delivery cycle by leveraging PLM to adopt knowledge-driven manufacturing and re-usable templates.
Linking processes, products, projects and people

Reliable oil and gas equipment enables successful and profitable projects. Manufacturers must operate efficient individual operations, but also collaborate effectively across the value chain. The entire supply chain is only as strong as the weakest link. Making smarter decisions on risk, time, cost and quality are the keys to determining success or failure on a project. Critical decisions need to be made every day in this industry. But how can you improve decision making through high-definition information?

Through a secure integrated information environment, Siemens PLM Software helps you link all your product data, processes and people across your global value chain. Information is shared to support collaborative decision making at all levels, removing time and error from the capital project development process.

The need to deliver transformative solutions is forcing oil and gas companies to re-examine innovation processes. Successful organizational transformation requires you to facilitate innovation, enable collaboration both inside and outside your organizational borders and instill discipline across your lifecycle processes. Siemens PLM Software provides a PLM platform especially designed for oil and gas equipment manufacturers that unifies both the product and production lifecycles.

Siemens PLM Software is setting the pace with a future vision that delivers a new level of value to companies around the globe. By leveraging best-of-breed technologies for the product development and production lifecycles, your company will be able to share both product data and process knowledge while leveraging simulation models to ensure optimized and reliable lifecycles.

This strategy is especially valuable for equipment manufacturers who can leverage new PLM-enabled technologies such as world-class simulation technologies to virtually verify every aspect of any machine before you build it. This innovation has a tremendous impact on your ability to lower your organizational costs and deliver safe and reliable products for industry.
Simulating products virtually

The effective use of simulation can help you reduce downstream costs and risks.

OEMs must improve their engineer-to-order processes
Model-based engineer-to-order equipment design

Strong global demand for oil and gas has boosted the demand for reliable equipment. To succeed at delivering innovative products that can operate under diverse conditions, OEMs must improve their engineer-to-order processes.

The effective use of simulation can help you reduce downstream costs and risks. Also known as computer-aided engineering (CAE), simulation enables engineers to understand, predict and improve product performance digitally. Siemens PLM Software provides NX™ software, a world-class computer-aided design and simulation solution that facilitates:

- **Concept design and styling.** Develop concepts using the most appropriate modeling approach including standard parametric and freeform techniques. Virtual prototyping enables rapid concept evaluation and iterative design validation.
- **Reverse engineering.** Generate CAD models from scanned physical objects by mapping surfaces and curves to the polygon mesh. Rapidly evaluate the data’s usability.
- **Re-usable processes.** Take advantage of knowledge-driven CAE as a unified part of the digital product development environment.
- **Multidiscipline solutions.** Employ integrated multiphysics, multidiscipline finite element analysis (FEA) and computational fluid dynamics (CFD) solvers, and design-integrated multibody motion simulation.
- **Test and simulation.** Ensure reliability of equipment with virtual testing and simulation solutions.

Information and process management

New products are increasingly developed by global design and engineering teams. Teams need to track project schedules, resource allocations, customer specifications and all of the product/process knowledge generated by the distributed value chain. The oil and gas industry is using PLM technology to help establish a flexible collaborative environment that improves information sharing and process standardization.

Siemens PLM Software provides Teamcenter® software solutions to enable you to build an open and collaborative global engineering and manufacturing environment that facilitates:

- **Globally distributed product development.** Enable widely dispersed team members to work together in a highly iterative and systematically managed process.
- **Flexible manufacturing.** Leverage manufacturing knowledge and capabilities within the product development process.
- **Global supplier collaboration.** Seamlessly connect suppliers.
- **Virtual simulation and product performance.** Enable your teams to perform product reliability by testing both behavioral and functional perspectives.
- **Open support for industry-standard data exchange formats.** Siemens PLM Software supports open standards, including the JT™ data format, an ISO international standard for viewing and sharing lightweight 3D product data.
- **Compliance and audit trails.** Manage hazards (HAZOP) and risks with traceability to measures and requirements.
Integrating manufacturing and the supply chain

Digital manufacturing and supply chain integration
Siemens PLM Software provides comprehensive digital manufacturing solutions to address a variety of manufacturing disciplines. Manufacturers can minimize capital investment and maximize long-term ROI through increased planning accuracy and efficiency. You can shorten time-to-production through the analysis of product manufacturability and process development; enhance the logistics and performance of entire production systems; optimize resource utilization; and accelerate product launches with proven solutions for process optimization that cross multiple departments and disciplines.

Siemens PLM Software provides a production-proven solution to increase manufacturing planning and execution productivity. Advantages of the solution include:

• The ability to re-use certified processes and reduce capital equipment costs by capturing and managing manufacturing knowledge within a single system
• Detect and eliminate problems within production systems that would otherwise require time-consuming and cost-intensive corrective measures during production ramp-up
• Reduce assembly planning tasks, planning time and associated costs
• Share and analyze information within a digital environment to provide insight into the various stages of process development and the impacts of those processes
• Streamline communications so you can adapt to customer demands more rapidly, with decisions based on facts
• Guarantee traceable and auditable contractual and regulatory compliance even after many changes that occur during the project or product lifecycle
Field services project management
Teamcenter helps you integrate your extended enterprise across all stages of a project. Everyone involved has the latest information reflecting the most recently approved changes. Solutions to support project execution in the field include:

• Enabling you to record and categorize capabilities for use in finding, selecting and monitoring suppliers and contractors
• Helping you standardize the RFP data collection process
• Leveraging simulation capabilities using Tecnomatix® software to improve onsite assembly safety and efficiency

Operations and maintenance
Assets operate under harsh conditions, yet maximum uptime is essential. Teamcenter helps you:

• Manage knowledge about your equipment throughout its lifecycle
• Use configuration-driven operations and maintenance planning to stay in compliance with the many changes that occur during the project or product lifecycle
• Enable service personnel to easily and accurately obtain the information they need
• Provide visual instructions for equipment training, operations and repair

Employee health and safety
The oil and gas industry is committed to ensuring safety and security, and adhering to national and international compliance standards. Siemens PLM Software provides innovative solutions for employee health and safety including:

• Process simulation solutions to optimize safety, timing and planning processes
• Virtual training solutions for pre-job briefings to help workers visualize tasks
• 3D human simulation to study worker tasks for ergonomics and safety
Reaping the benefits of product lifecycle management

Scalable
Siemens PLM Software’s enterprise PLM solution provides a platform that can scale to thousands of users and suppliers.

One of our customers provides heat transfer, separation and fluid handling systems. The long distances between its employees used to delay the product development process. Today, a dispersed workforce is a competitive advantage. By using PLM to integrate its global development teams, the company now enjoys a more productive, around-the-clock development process.

Proven
Oil and gas equipment manufacturers rely on our software to help improve products and processes.

Experts at leading oil and gas equipment manufacturers use advanced structural-thermal solutions that enable analysis flexibility. One company uses Siemens’ simulation solutions to design sensors to comply with regulations. The solution has allowed the company to bring FEA analysis in-house, saving valuable time and cost.

Open
Siemens PLM Software supports the ISO 14306 industrial data exchange standard. Our service-oriented architecture (SOA) helps you deploy more business capabilities, reduce IT complexity and accelerate IT implementation.

Siemens PLM Software enables integrations with CNC and shop floor applications. This helps reduce time-to-market and manufacturing costs by closing the gap between engineering and manufacturing teams, significantly reducing nonproductive re-equipping time on your machine tools.

With its unique range of products and solutions plus decades of experience, Siemens is a technology partner for the oil and gas industry. We stand for reliable, innovative, efficient and environmentally friendly software, systems, products and solutions throughout the engineering process. We closely align R&D activities with business strategy, hold key patents and are successful on a global scale by operating in more than 190 countries and employing over 400,000 people. This scope and experience provides Siemens with a unique understanding of the oil and gas equipment industry’s global business requirements.

Siemens PLM Software is helping companies deliver increasingly more complex equipment and solutions in a marketplace that requires high reliability, shorter delivery cycles, lower product development costs and improved total cost of ownership. Our unified, open and strategic information management platform delivers these strategic advantages by providing innovation capabilities tailored for oilfield services and equipment companies.

Our foremost goal is the lasting success of our customers. We strive to provide answers to society’s most vital challenges, enabling us to create sustainable value worldwide.

For more information about Siemens PLM Software, contact your local sales representative or visit www.siemens.com/plm/oilandgas.
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About Siemens PLM Software
Siemens PLM Software, a business unit of the Siemens Digital Factory Division, is a leading global provider of software solutions to drive the digital transformation of industry, creating new opportunities for manufacturers to realize innovation. With headquarters in Plano, Texas, and over 140,000 customers worldwide, Siemens PLM Software works with companies of all sizes to transform the way ideas come to life, the way products are realized, and the way products and assets in operation are used and understood. For more information on Siemens PLM Software products and services, visit www.siemens.com/plm.

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