



**SIEMENS**

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Integrated engineering and operations to  
increase efficiency in the oil and gas industry

COMOS – Making data work.

Answers for industry.

# Foundations for growth

Oil and gas still are the main sources of energy for the global economy – in fact, the demand for fossil fuels is expected to grow and the prices for oil and gas are predicted to increase over the next years. At the same time, easy-to-develop deposits are nearly exhausted and the existing production and refining infrastructure has often reached the limits of their capacity. This is complemented by an increasing awareness for the potential health, safety and environmental risks associated with operations in the oil and gas sector. Moreover, the methods used for exploiting oil and gas reservoirs are becoming more and more complex.

In order to benefit from the opportunities of this growing market, the industry has to find ways of reducing the costs and risks associated with developing new fields in deep sea or extreme climates. New plants have to be designed to allow for speedy commissioning as well as flexible and safe operation. Existing facilities need to be modernized to accommodate for novel exploration techniques and situations. Plant operators need to find ways to handle the increasingly complex requirements of maintaining and upgrading their existing infrastructure in an ever stricter regulatory environment.

## **Beyond today. Beyond tomorrow.**

What the oil and gas industry is facing is nothing less than a shift in perspective – from exploitation to management of fields, resources, assets, and knowledge. A drilling rig may be designed to operate for 40 years, but with a view to rising prices for oil and gas, it might pay, and pay soon, to invest in a new or enhanced rig to better exploit the field. Being able to flexibly and timely satisfy the market demand means being able to turn volatile prices into solid earnings. Plants and assets are no longer static – they grow and change with the market. For plant engineering and operation, this means that ensuring data consistency and data quality is a job for a plant lifetime. Data has to be handed over from engineering to operation in a consolidated, maintainable way. Data has to be modified and updated throughout the entire plant lifecycle.

And all these changes have to be documented and tracked in a timely fashion to ensure safe and efficient operations for now and for years to come.

With COMOS, Siemens helps oil and gas companies to rise to the challenges of this dynamic market environment – by integrating engineering with operations and ensuring data consistency across the entire plant lifecycle.



How to shorten the engineering cycle?

How to manage complexity and changes?

How to achieve operational excellence?

How to keep and transfer knowledge?

How to decrease the total cost of ownership?



### From well to well done

While the general market environment is the same for all segments, some requirements are unique to specific processes.

Upstream plants are faced with operations in challenging conditions, such as in deep-sea drilling or in the arctic. Key issues are strict regulatory requirements, extending platform life and efficient extraction of hydrocarbons.

Downstream facilities have to be able to flexibly adapt capacities and processes to satisfy an increasingly volatile market while delivering consistent product quality obtained at minimum cost.

EPCs have to shorten project runtimes, enable a collaboration platform for global teams working with different engineering systems – and ensure an efficient handover of the plant to the operator.

Plant owners and operators need to ensure both plant availability and environmental and workplace safety. For this, they need consistent data and documentation.

## COMOS answers.

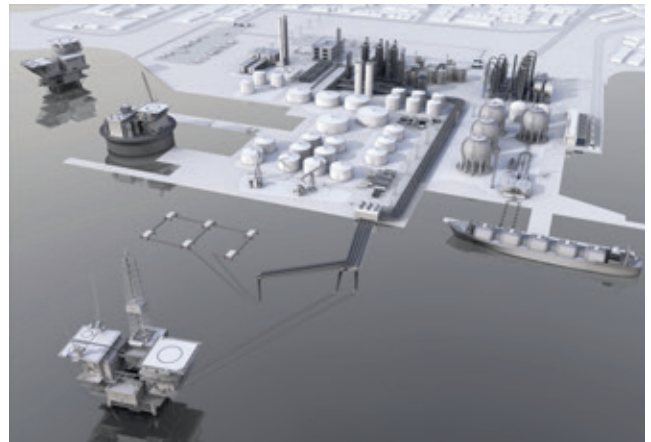
Enable effective supply chain collaboration and sourcing to streamline engineering and planning in global teams.

Compile all lifecycle and engineering information in one common data base to efficiently manage increasingly complex data.

Track and manage asset data and documents to ensure better regulatory compliance and optimum availability.

Attract, retain and efficiently deploy human resources by providing a consistent knowledge base of engineering and plant information.

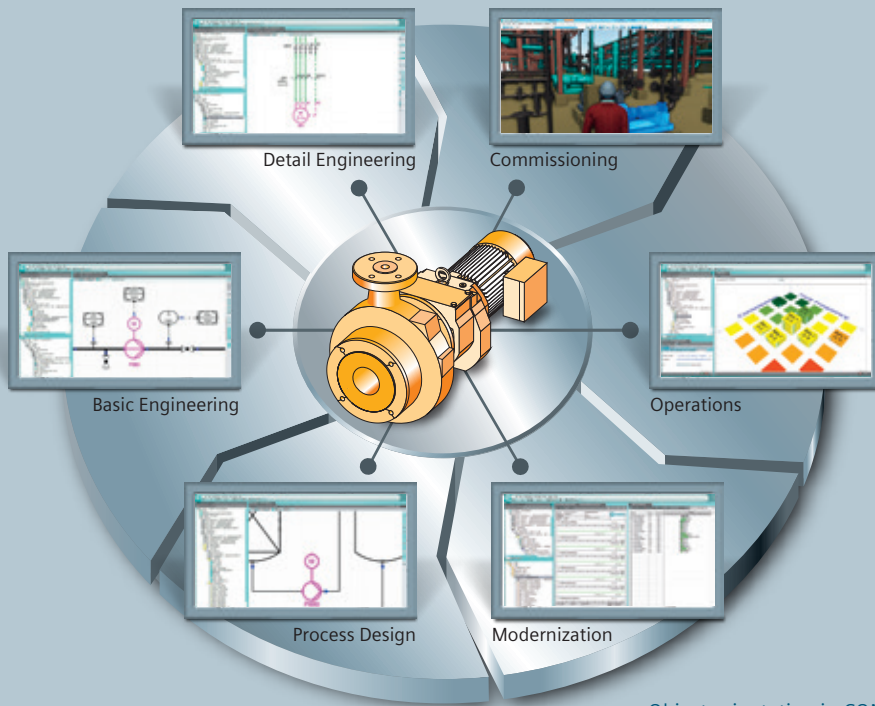
Create and maintain a consistent plant and project documentation to support efficient and effective maintenance and modification.



### COMOS – Making data work.

With COMOS, Siemens offers a truly unique and comprehensive software solution for the integrated management of plant and project data. COMOS provides a single data base for all plant and project data. The open software platform comprises solutions for all stages of the plant and project lifecycle and can be easily tailored to perfectly match the specific requirements.

COMOS ensures that engineers and operators can access data anytime, anywhere to speed up engineering times, optimally exploit available resources and to facilitate the creation of custom designs for specific technical requirements. And finally, it creates a collaborative environment for teams across sites and disciplines to increase work efficiency and safety.



Object orientation in COMOS:  
All object specifications are  
available everywhere and at  
all times.

- Process Engineering
- Piping
- Isometrics
- 3D Integration
- Electrical, Instrumentation & Control
- Automation
- Control System Planning
- Pneumatic & Hydraulic Planning
- Training & Simulation
- Maintenance
- Shutdown & Modernization Planning
- Project & Plant Documentation

# COMOS – a solid base for perfect collaboration

The first step towards higher efficiency and flexibility in plant lifecycle management is ensuring spotless data quality throughout all phases of the plant lifecycle. Data has to be transferred smoothly from engineering to operations and vice versa, documentation has to be updated to always reflect the as-built state.

### Integrated plant and information management

With COMOS, Siemens provides the perfect answer to these challenges with a software solution that integrates all data across the entire plant and project lifecycle. The oil and gas industry can benefit from a software solution that ensures a seamless flow of information across all involved disciplines: from process design, basic and detail engineering to commissioning, operations and modernization.

### True-to-life plant simulation

Additionally, COMOS provides a tailored set of solutions that support efficient commissioning and operation. For example, COMOS Walkinside instantly links a virtual reality model with current plant information. The software solution displays the current status of a plant with a 3D simulation that is virtually true to life. The advanced 3D visualization supports plant commissioning and operator and staff training by providing a virtual reality environment. COMOS helps plant operators meet health, safety and environment (HSE) requirements by facilitating specific training sessions as well as emergency drills. And finally, solutions for service and maintenance management as well as shutdown, modernization and inspection management make sure your installation keeps up with the market requirements.



#### Your benefits with COMOS in oil and gas industry:

- More efficient processes throughout the entire plant lifecycle
- Access to consistent and actual plant information at all times
- Greater reliability in decision-making
- Global collaboration and parallel engineering in distributed teams
- Paperless lifecycle management

#### A single source for information

COMOS is based on an object-oriented concept. Each process or equipment object exists only once in the uniform COMOS database. All relevant engineering and lifecycle data as well as documentation is directly linked to this object. This enables standardization and prevents data duplication.

Plant and project documentation is stored and maintained in a secure, central database, providing access to authorized staff from all over the world while protecting know-how and safeguarding investments.

#### Effective collaboration support

Any changes made within plant engineering are immediately available to all other disciplines and departments without the need for interfaces. This affords you optimum transparency and interoperability – over the entire plant lifecycle. Serving as a central data hub, COMOS enables site-wide and even global standardization of engineering

and compliance standards, templates and documents. Changes can be managed, reviewed and released using workflows and working layers, ensuring change control and visibility.

The open software architecture facilitates optimum integration of third-party systems. Data can be exchanged using open standards such as XML and ISO 15926, ensuring easy integration into existing electronic data processing landscapes.

#### Streamlining engineering and operation

All together, COMOS provides an environment that enables intelligent data management for highest plant availability and safety. The oil and gas industry will benefit from an effective management of their processes and operations throughout the entire lifecycle and in full compliance with regulations – from upstream to downstream, from process design to engineering and commissioning to maintenance and overhaul.

# Our most treasured asset – the trust of our customers

In developing our products, we work closely with our customers, taking on board all of their input, questions, challenges, praise and criticism, to gain valuable hints for constantly fine-tuning our work. Our clients help us to design optimum solutions tailored to their particular needs. Customers around the globe trust our concepts for professional asset management. Read how our clients from the oil and gas industry benefit from COMOS.



## **Total S.A.**

“After only a short time, we have already managed to increase efficiency. This includes the data handling, data reliability, revision management and document management.”

**Philippe Prigot**

Service Manager for electrical engineering and instrumentation  
at Total Normandy refinery, Total S.A.



## **Aker Solutions**

“With our innovative engineering concept and the use of the COMOS software, we are able to perform work sequences simultaneously with higher data quality.”

**Stein Schjerve**

CIO of the engineering division  
at Aker Solutions

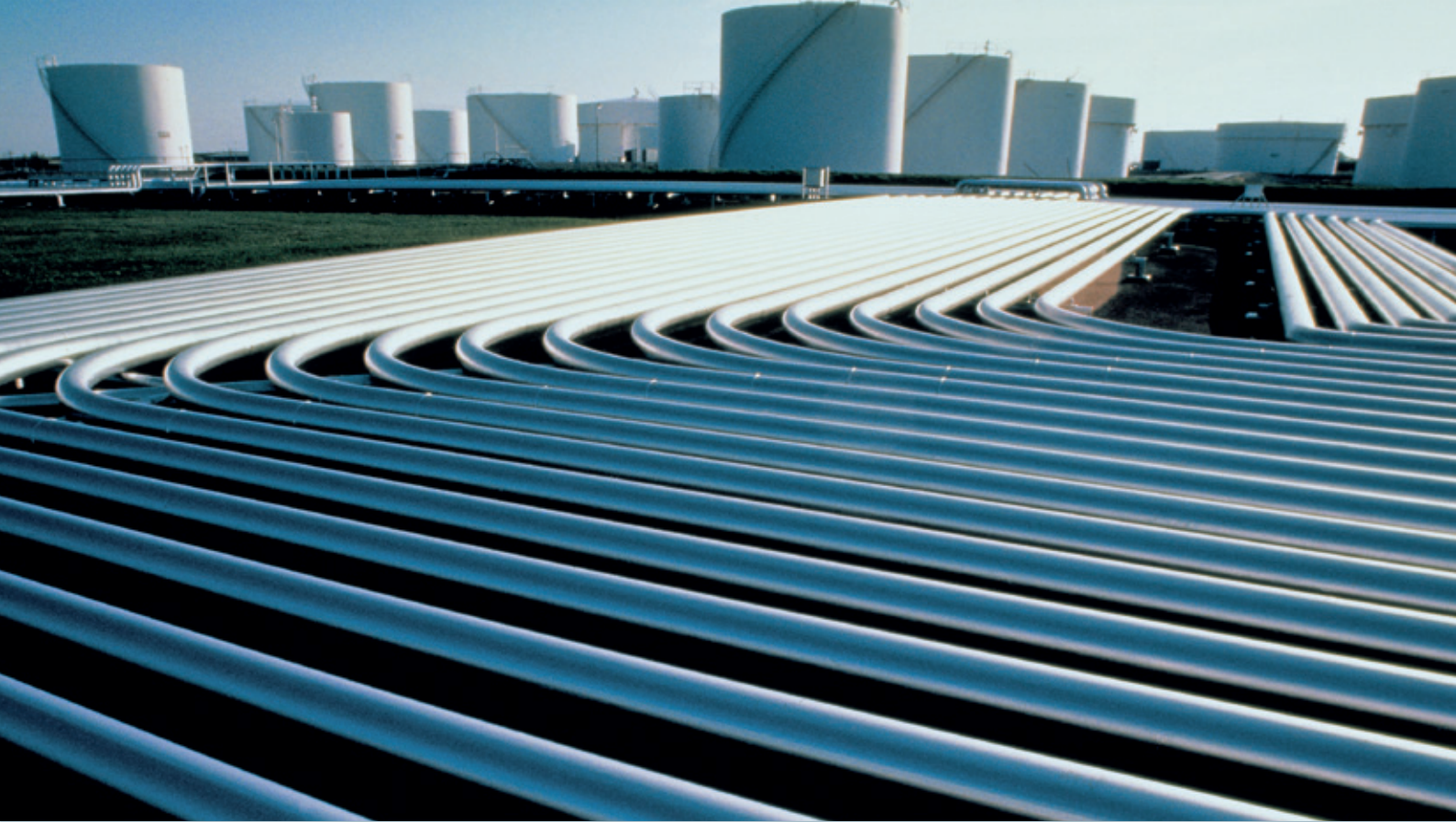


## **Sinopec Engineering Incorporation**

“Above all, it was the object-oriented database structure of COMOS that convinced us. This directly met many of our requirements for an integrated process development platform. Using this approach, we can supply even better products to our customers.”

**Zhu Chuntian**

Sr. Vice Director  
at Sinopec Engineering Incorporation



# Short and to the point

We hope you now have a good idea what COMOS can do and we have sparked your interest in our pioneering solutions for more efficient plant lifecycle management. Here is a brief explanation of some of the terms used in connection with COMOS.

## Data consistency

Data is entered only once and is then available to all stakeholders anytime and everywhere. Stringent inheritance and linkage mechanisms provide all stakeholders involved in a project with access to up-to-date and consistent data from any location and at all times.

## Data integration

Data integration brings information together from various data sources to construct a common data model with a standard structure. In software engineering, data integration extends from linking different applications up to the central provision of data and services on a unified user interface.

## File transparency

The integral function-oriented mapping of the plant enables standard communication across all levels. Consistent data is available to everyone involved in the project on a uniform data platform without any data loss. The complete documentation can therefore be reproduced at any time.

## Global collaboration

Everyone working on a project has constant access to a consistent database that is always up-to-date, independent of time zones and in real time. This reduces time-consuming and data-intensive exchange processes. All work processes between different locations are sped up and optimized.

## Interoperability

Interoperability is the ability of mutually independent systems and technologies to smoothly collaborate by complying with common standards. Information can be efficiently provided without the need for specific inter-system arrangements. This facilitates quick and reliable worldwide decision-making around the clock.

## Object orientation in COMOS

In COMOS, all data relating to the same component (a pump, for example) form a unit – an object. Changes to object specifications are stored in the central COMOS database so that the updated data is available everywhere and at all times.

There's more to it  
[www.siemens.com/comos](http://www.siemens.com/comos)

## COMOS – Making data work. For you too!

We are quite certain that your plant data and information are the key to unlocking your potential. If you like to know why we are so sure about this, you should speak personally to one of our experts.

Just get in touch with us. We are there for you at all times!

For more information, scan the QR code.



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