COMOS Plant Manager

COMOS – Making data work.

Edition September 2014

SIEMENS

Oil & Gas
Industry
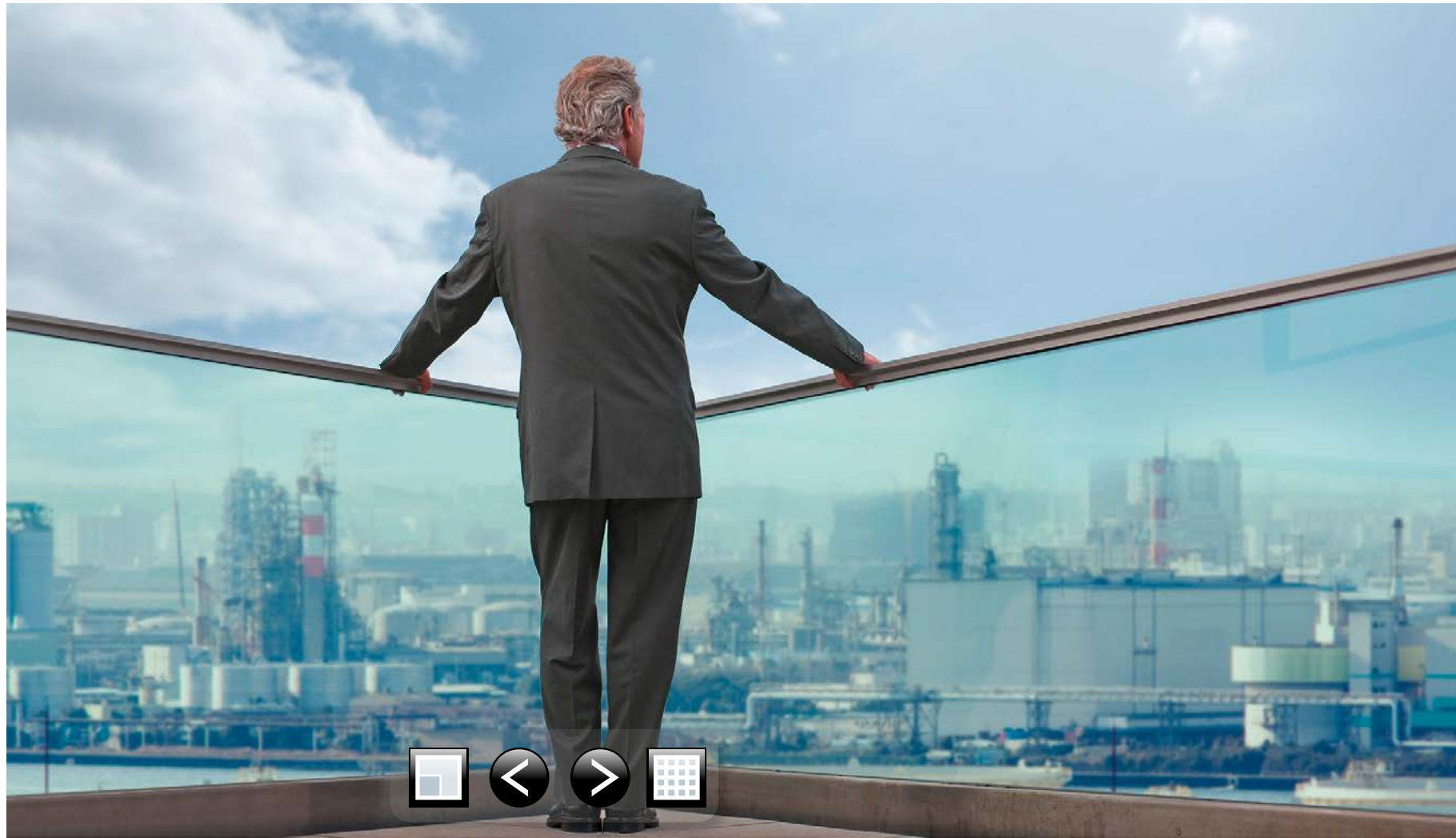Reference Aker Solutions

Process plant
planning
Reference Chemieanlagen-
bau Chemnitz GmbH (CAC)

ARC
White Paper
Improving Profitability
of Life Sciences Industries

Release
COMOS 10.1
Interview with Jan Rougoor,
Head of Product Management

"Internal studies show we have achieved engineering savings of between 8 and 12% by using COMOS software."

Christoph Jauslin
Head of Engineering IT, Novartis Pharma AG, Switzerland

Dear readers,

Content

In this issue you can read about:

Interoperability in plant engineering

A long-term plant engineering strategy supported by efficient engineering software products, that's Aker Solutions approach to the oil and gas industry's demand for continually higher engineering quality and decreased execution time for project developments.

As one of the leading engineering companies in the oil and gas industry, Aker Solutions is specialized in delivering complex project solutions for challenging environmental conditions. Via its headquarters in Norway and a network of global branches, Aker Solutions provides comprehensive engineering services and is involved in the engineering design, maintenance and renovation of complex industrial plants for its well-respected customers. Efficient data management and high quality in the data delivered is decisive factors for avoiding errors during construction and operation of a plant, and to ensure that possible problems can be dealt with early. As development of plants and installations become more complex and involve ever greater volumes of data, these challenges are increasing. »

Continuous further development of the plant engineering concept

Aker Solutions have for decades employed innovative IT solutions in their plant engineering, to stay ahead of these constantly growing challenges. These solutions are based on CAE (Computer Aided Engineering) software and have been developed continuously over many years. Today the IT solution for plant engineering is in its third generation.

In the first generation deployed in the early 1980s, the company used 2D and 3D CAD (Computer Aided Design) software in conjunction with a central documentation system.

The second generation was based on a software tool designed by the company itself, where all project data could be managed centrally. This concept followed an object-oriented approach and allowed controlled, simultaneous engineering.

In 2006, Aker Solutions took a decision to replace their own systems engineering software tool with a third party system, COMOS from Siemens. This software solution is a key component of Aker Solutions third generation Engineering IT solution.

Standard software solution as data hub and planning tool

The software solution COMOS forms the basis of Aker Solutions' Project Data Hub, and also delivers integrated engineering tools supporting key stages of the engineering lifecycle. COMOS is based on a uniform data platform and takes an object-oriented approach. In this context, object-oriented refers to the holistic description of a component/object in a single entity in a single database. »

"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
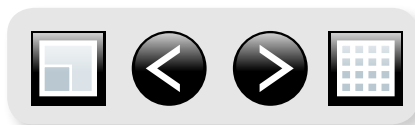
Numerous individual aspects of the various technical disciplines and departments form an overall picture for the specific component. Controlled cooperation between the various disciplines and external companies is achieved through the working layer technology embedded in the software. The open software architecture also allows Aker Solutions to connect other software tools such as weight control software. Flexible bidirectional data exchange with the other software systems is possible via various interfaces. Due to these properties, the software represents the ideal answer for Aker Solutions, allowing them to manage all the engineering data as a central project data hub. The software is also used as an engineering tool in the FEED phase and in detail engineering, for example in the creation of P&IDs (Piping and Instrumentation Diagrams) or the EI&C (Electrical, Instrumentation and Control) design.
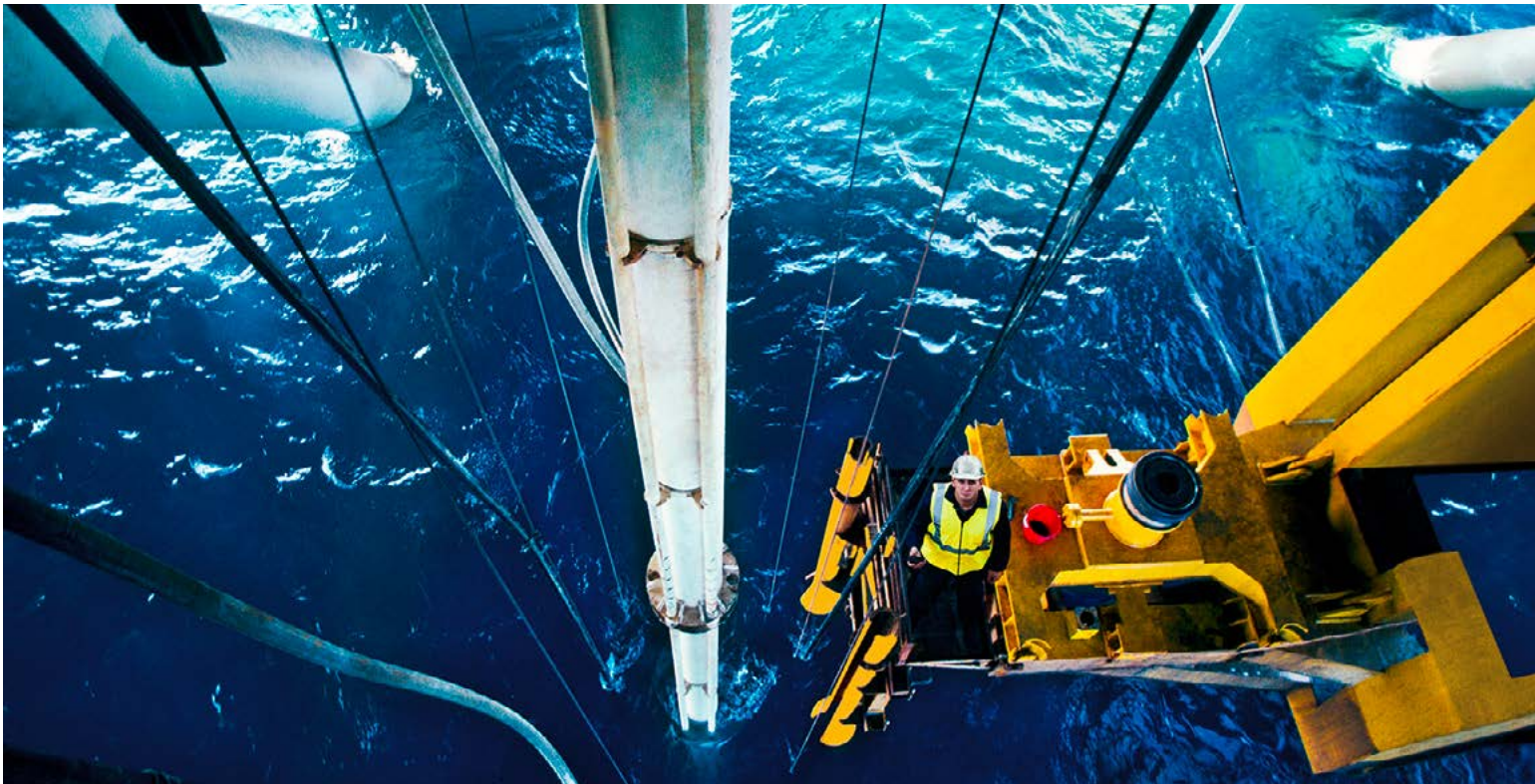
Tried and tested in practice

Nowadays, almost 1000 users work with the COMOS software at Aker Solutions. This group is further expanded by suppliers/subcontractors who exchange their project data with the COMOS project data hub. Significant numbers of FEED (Front End Engineering Design) projects and multiple detailed engineering projects have been executed. "With our innovative engineering concept and the use of the COMOS software, we are able to perform work sequences simultaneously with higher data quality", says Stein Schjerve, CIO of the engineering division at Aker Solutions. COMOS is the primary source electronic data handover to Owner Operators. But even with these good results, the company is already working on further developments of their plant engineering concept, in which the COMOS software solution will continue to play a key role. «

Improving Profitability of Life Sciences Industries Using Good Asset Information and Compliance Management Practices

Squeezed between pressure from consumers and regulators alike to increase drug quality and safety, and from governments to reduce healthcare costs, the life sciences industry must transform the way it develops, manufactures, and commercializes new drugs. This challenge also represents a tremendous opportunity for the industry.

Companies such as Sanofi and Novartis have pioneered new ways to improve process development, plant engineering, asset management, and compliance management, yielding impressive results. Both companies have used one of the Siemens software solutions, COMOS, to help streamline their process for maintaining asset information used throughout development, engineering, operations maintenance, and compliance management processes. Combined with other process streamlining activities, this helped reduce engineering effort by between 10 and 20 percent. ARC Advisory Group also »

estimates that these process streamlining efforts can help reduce the time it takes a drug company to move from drug development to operational readiness for full scale production by around three to seven months to help reduce investment risk and improve profitability.

As we'll also explore in this paper, in the coming years, leading life sciences companies will also implement modular production technologies and modular engineering processes to further reduce the development and engineering phases. These will help them to anticipate and adapt rapidly to changes throughout a drug's lifecycle. COMOS software provides an "asset data hub" for process design, engineering, maintenance, operations and compliance management. This provides life sciences manufacturers with close to real-time visibility into engineering information, asset state, and asset health. This is paramount to help accelerate development and engineering processes.

The solution links operational risk assessment to asset requirements and test plans, accelerating certain regulatory approval tasks. It also enables accurate and timely decision making during operations and maintenance and helps ensure up-to-date plant documentation. In addition to cost and time benefits in R&D; business benefits include reduced operational and safety risk; increased productivity of engineering, maintenance and operations; in certain cases faster operational readiness of assets and operations personnel; and more accurate and less costly regulatory compliance. «

Click here to download the complete version of the white paper.

COMOS Best Practice:
ARC and Siemens Webinar on Efficient Engineering and Operations of pharmaceutical plants

Platform for a consistent engineering workflow

The planning of process plants is an interdisciplinary process that is firmly based on a division of tasks and has extensive dependencies in its organizational and data structures. Rising demands in terms of quality, safety and environmental impact, high cost pressure and the customer's desire for a shorter time-to-market are forcing plant designers to optimize their process and work processes continuously. Consistent data management and a rising level of standardization by means of an integrated software solution is a practical way of raising efficiency in this respect. Chemieanlagenbau Chemnitz GmbH has successfully been following this path and profiting from its advantages for many years.

For several decades, Chemieanlagenbau Chemnitz GmbH (CAC) has had to deal with the fact that the path from the initial feasibility study to the finished plant is occasionally long and seldom straight. Under this name, the engineering, procurement and construction company (EPC) has been successfully implementing projects for customers worldwide since 2004. The roots of this company, however, extend as far back as 1811. As there has been a plant construction division in Chemnitz since the 1960s, the people here know all about the changing requirements affecting plant engineering. Frank Pölitz, who has known the company from its days as the plant construction division of VEB Germania, Karl-Marx-Stadt, and who today heads the IT Services at CAC, can confirm from experience: "Building a sulfuric acid plant in the 1980s probably called for the same engineering input as today. The tools and the project conditions, however, were quite different in those days." Before computers found their way into planning offices, all documents were prepared by hand and calculations were usually performed on a pocket calculator. Any changes to the design involved enormous expense. By comparison, plant design and engineering has now become a much more dynamic process: Global invitations to bid, prices updated on a daily basis, and efficient communication options mean that changes are part of the daily routine for EPCs. But because there is a demand for ever shorter project runtimes, tools for improving efficiency and methods for data integration across plant unit boundaries are a mandatory requirement for survival in the market. »

Experienced partner for engineering services: Chemieanlagenbau Chemnitz GmbH (CAC) assumes all tasks from the planning and construction to the commissioning of complex plants and plant sections. (Source: SIEMENS AG)

COMOS provides a database for all plant sections

CAC offers all services for constructing new process plants, or converting and expanding existing plants, and executes engineering, procurement and construction projects worldwide in the industrial sectors of oil and gas, petrochemicals and inorganic chemicals.

More than half of approximately 250 people employed at Chemnitz work in process engineering or in an engineering discipline such as plant, construction or equipment engineering. In everyday work, each specialist department relies on specific software tools. When selecting the planning software, the company complies with the ideas and requirements of the customers wherever

possible. The IT environment overseen by Pölitz and his team is very varied, in line with the tools that are used. Across the boundaries between plant sections, COMOS – the Siemens software solution for integrated plant management – acts as a linking element to which all employees have access. The advantages for plant engineering are evident in several respects: The impressive software solution is the result of an open system architecture which permits the integration of data from other software applications across the entire planning process. What is more, the software is the perfect engineering platform for CAC, thanks to its object-oriented data storage and the use of a single database for all plant units. The EPC uses the software solution as a central, multilingual data hub during the project work.

During design and engineering, each component is specified as an object in the COMOS database – from insertion into the first process flow diagram to the commissioning of the plant – with a growing amount of information. The integrated software solution offers the individual departments specialized applications for the respective planning stages, e.g. for the piping and instrumentation engineering, for the electrotechnical engineering and for the function planning. As already mentioned, all departments involved in the planning, even external service providers, have access to the same database at all times. This means that the latest changes to objects, or to documents linked to these objects, are always available to every user. All technical disciplines are able to work on the project at the same time. The consistency of data made possible by COMOS reduces to a minimum the possibility of an error-prone data exchange, duplicated manual inputs, or waiting times while transferring data between the individual plant sections.

The typical flow of information

After the customer has handed over the process documentation, the first step is always to simulate the process. Whereas only a few simulation runs were previously possible with manual calculation, almost any number of variants can be calculated today with the aid of process-engineering simulation tools from AspenTech, Invensys or ChemStation. Even in projects for which the EPC does not perform the basic engineering themselves, but are

provided with the data, the input is thoroughly tested by means of process simulations. The media data, material flows, variables, etc. can then be imported into COMOS. The expert knowledge and experience of personnel, however, remains essential for this stage.

The imported volume of data serves as a basis for basic and detail engineering. For example, all necessary data sheets and lists or material information, but also overview plans such as process flow diagrams or piping and instrumentation diagrams (P&IDs), can be generated. When designing equipment such as valves and piping, CAC uses specialized applications whose data is also imported into COMOS. The data and information that is created in COMOS in this way forms the basis at CAC for the work of the subsequent plant sections such as installation planning and pipework planning, but also for purchasing. Since the plant management software enables all the latest information to be held centrally in a database, any changes that are necessary can be implemented with great flexibility. The process engineering frequently sets the pace in this respect. Requirements arising from the process, such as the delivery rate of individual pumps or tougher material requirements to comply with specifications, as well as requests from the customer, such as the specification by the pump manufacturer, call for modifications to components already specified. If a change now occurs, all plant sections affected by it are informed immediately due to the dependent relationships and can then adapt their design data accordingly. In addition, the data sheets and material extracts that can be »
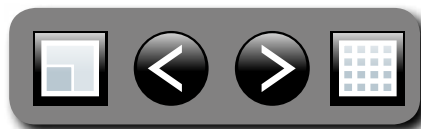
generated from COMOS are necessary documents for the purchasing of fittings, apparatus, machines and piping systems.

Greater transparency and higher level of standardization

COMOS was introduced at CAC in 2004 and since then has developed into the central data platform of the engineering. The use of the software solution gave the Chemnitz EPC two additional and crucial advantages: greater transparency and a higher level of standardization. Before the company was able to profit from this, all engineers were called upon to implement the software solution concept in Chemnitz. If data is stored in a central database, it is public. "That is quite a different type of transparency than forwarding infor-

mation with comments to selected colleagues on request", recalls Pölitz. This mode of working demands trust, responsibility and communication in all directions. The familiarization period was characterized by uncertainty and the parallel maintenance of data in the old systems, but was swiftly surmounted because colleagues soon recognized the potential of the new working method: the implementation of shorter and shorter project runtimes.

The steps toward standardization ensured common understanding and the optimization of the exchange of knowledge across departmental boundaries. From around 10,000 attributes used in house as characteristic values of apparatus and equipment, just 3000 remained after eliminating different versions and duplicates. These now form the common "language" of all engineers. For example, the attribute "operating pressure" is now uniformly defined throughout the company, has the same abbreviation, and is always accompanied by the appropriate unit of measurement. To each object type, graphical representations corresponding to the respective planning document are assigned that conform to international standards, but can also be adapted at the customer's request. The corporate standards permit the exchange of data across plant sections with little loss, while promoting the exchange and the reuse of know-how and they are an important component for a functioning overall entity.

"COMOS is the central data hub for every engineering activity in our company and, at the same time, its introduction has brought more order to our project business."

Frank Pölitz,
Head of IT Services at CAC

Document management retrofitted

CAC introduced the next stage of standardization in 2010: The COMOS PQM document management system has since ensured an even more structured project documentation. This concerns not only the documents that are generated from the plant management software, but also the documents that are not created in COMOS, such as descriptions, calculations, drawings and correspondence that occur in every project in a variety of file formats. The external documents are now assigned to the database objects concerned, instead of being stored in folder structures. In addition, the solution has a version and revision management. For each document, the history, author, test stages, responsibilities, etc. can be displayed. This all ensures greater traceability and transparency. The implemented test and release procedure not only simplifies the work: When the project is handed over, the customer also receives consistent and up-to-date documentation.

Better quality and organization in project business

Life at CAC would now be unimaginable without the integrated software solution from Siemens. Frank Pölitz affirms this: "COMOS is the central data hub for every engineering activity in our company and, at the same time, its introd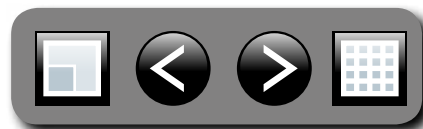uction has brought more order to our project business. It is a solution that enables us, despite conditions that are becoming more dynamic, not only to maintain the quality of our engineering at its current level, but to improve it even further." «

NEWS

Siemens at the Hannover trade fair 2014

»

The futuristic exhibit attracted flocks of visitors with almost nobody wanting to miss the opportunity to take a virtual walk through the plant model. The great interest in COMOS Walkinside resulted in lively discussions between the visitors and the COMOS team.

Working with COMOS Walkinside provides you with significant added value.

As one example, it is possible to train personnel in occupational safety and in trouble-free working procedures even prior to commissioning; in other words while the plant is still being developed or is being built. This plays a major role particularly for companies in the oil and gas industry and refineries that that have to adhere to strict regulations relating to occupational safety, environmental protection and documentation. The user can play with an avatar and walk-through the entire plant from one end to the other up and down stairs, past pipes, pumps and other equipment in real time. This familiarizes personnel with the plant even before it is actually put into operation. In addition to this, training can take place anywhere in the world making it more comprehensive, safer and cheaper.

The great strength of COMOS Walkinside is, however, not only in the 3D visualization of the plant. COMOS Walkinside allows access to the entire plant data throughout the entire life cycle starting with the engineering continuing through efficient operation right through to dismantling of the plant.

Even in the engineering phase, COMOS Walkinside can be used to visualize the current planning status. All members of the project can check the feasibility of the plant model together regardless of their location or specialist discipline. This means, for example, that everyone involved can see immediately where a pump is being installed, where a valve is located, where pipes are being laid and whether passages are adequately large and have been planned to meet the safety regulations. This allows planning errors to be avoided and eliminates costs that would result from modification or adaptation in a later phase of the project or even after the plant is put into operation.   «

Learn more about COMOS Walkinside:

"How 3D gaming technology creates entire industrial plants in virtual reality" – Marketing manager Manuel Keldenich answers all your questions in the interviewt

"COMOS Walkinside - Powerful 3D Virtual Reality Visualization" – Marketing manager Manuel Keldenich reports live from the Hanover trade fair

Further release of COMOS Generation 10

The next level

The COMOS software solution administers project-relevant data, offering the ideal foundation for higher productivity when planning and operating process control plants. With the software version, which has been available since the end of the last year, the enhanced COMOS Generation 10 provides the process industry with a major increase in efficiency.

The COMOS 10 software generation is a model of integration, interoperability, and innovation. The current release of this solution now offers even greater interoperability of disciplines and software, and, thanks to its innovative technology, allows the virtual inspection of plants from the very first planning stages. The COMOS enterprise platform has been further developed with this current release, COMOS 10.1. The integrated data hub is adaptable to the requirements of specific industries, ensuring that the ever-increasing amounts of project data will be edited quickly and managed securely in the future, too. The user benefits from reduced customizing expenditures and simpler installation, and consequently from a significant competitive edge.

Easier integration of pdf documents in P&ID

The newly released COMOS Generation 10 also increases the level of integration in pipeline and instrumentation design (P&ID). Pipeline and instrumentation flow diagrams in pdf format can now be simply linked with a process flowchart in COMOS P&ID or even transferred as a complete file. All the data from the pdf design are then available in COMOS and can be matched to existing rule-based objects. When necessary, the components in the COMOS data bank can be reedited, which significantly reduces the effort for inventory transfer. For systems engineers, who often take over pipeline and instrumentation flowcharts from subcontractors, manual mapping is greatly simplified or even becomes unnecessary thanks to the new import function in COMOS.

The COMOS product solutions integrate with each other and support the user with intelligent tools throughout the complete lifecycle of the plant

Information flows across software suites

The planning of process plants involves many disciplines and specialties. Interoperability is the key for effective operating sequences. Data and documents must be exchanged easily and securely between different software applications, locations, and teams. COMOS makes this possible with its open system architecture and standardized interfaces. Innovations to COMOS PipeSpec provide improvements such as simplified and accelerated data exchange with third-party programs and an update to XMpLant import possibilities.

Here, the compatibility with Probad, IBM's calculation software for the design of pressure parts, has been expanded. Bidirectional data exchange of pipeline specifications, including revision management, now allows for a further increase in data quality and engineering efficiency.

The new process data interface ensures improved information exchange between product and system design, with which the user can more efficiently synchronize　**»**
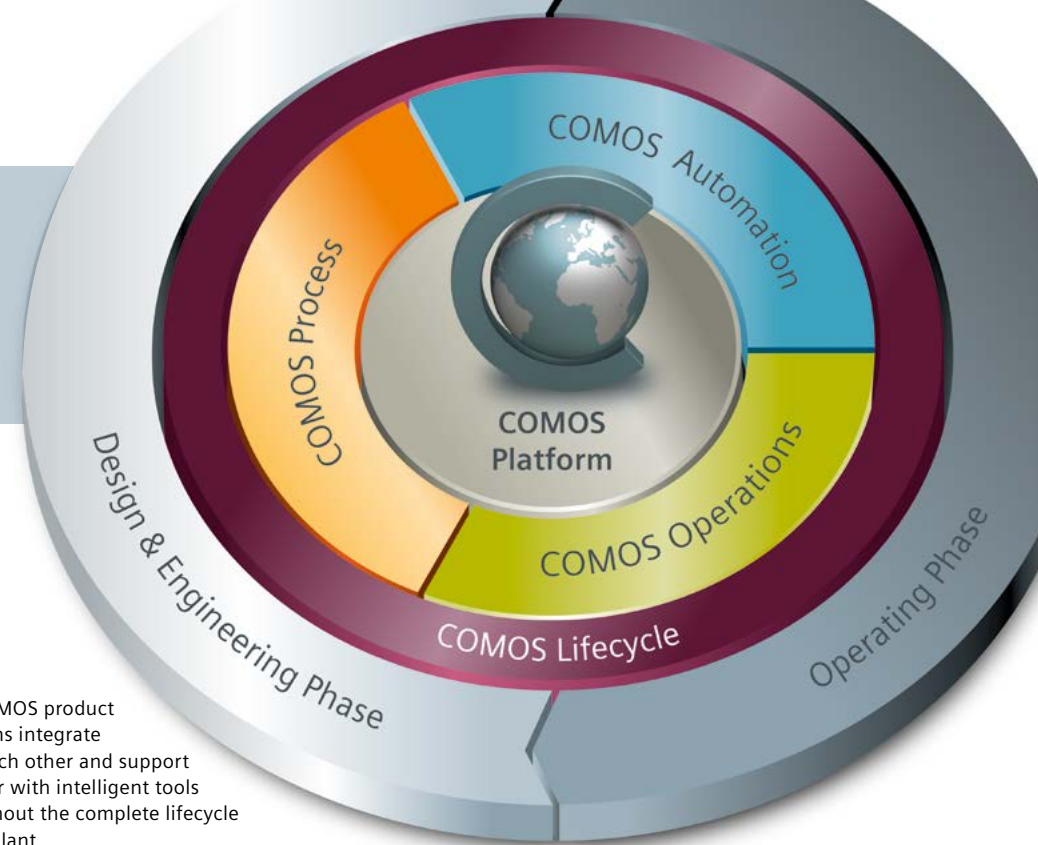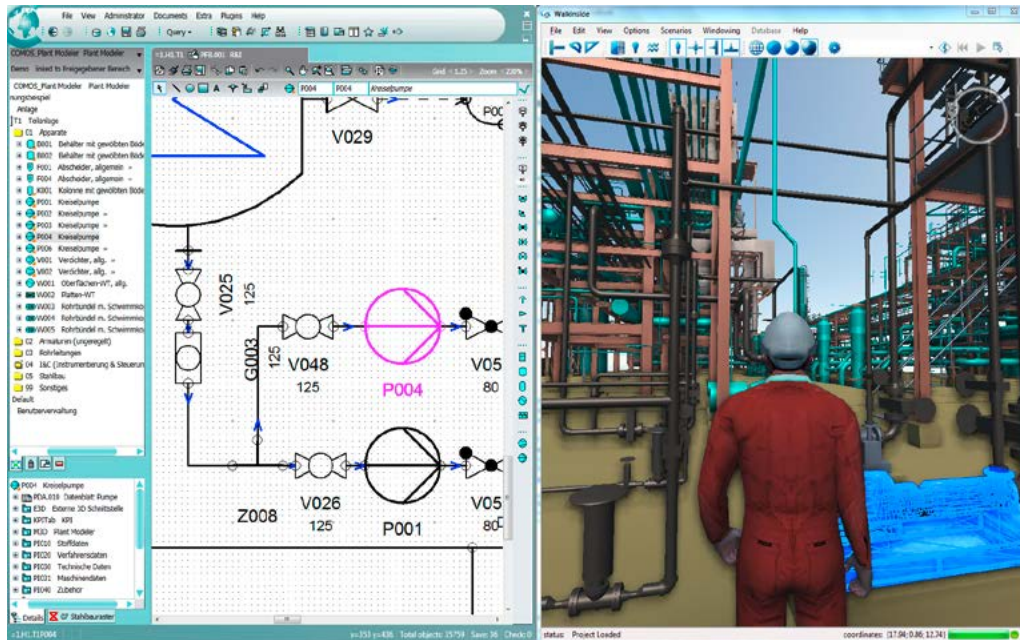
In Comos Walkinside, it is possible to navigate directly from the virtual image of a component to the display of that same object, on the P&ID, for example

world in real time. All object-related data records, such as parameters, safety reports, maintenance information, handbooks with P&IDs, function charts, and so on, can be accessed directly from the virtual object. This visualizes information and simplifies the processes for everyone involved in the engineer-

ing and operation of plants. New features, such as the easy segregation or color marking of objects in the virtual model or the simulation of fires or gas leaks, expand the already numerous possibilities of this software solution. «

components and catalogues between COMOS and the Siemens Teamcenter PLM (product lifecycle management) software. System structures from 2-D systems engineering with COMOS are cross-matched and exchanged in a consistent manner with 3-D design in NX, the product development solution based on Teamcenter. Teamcenter allows company-wide, global access to product information throughout the complete system lifecycle.

Innovative 3-D system visualization

The new software release offers an innovation in plant management with the further

development of COMOS Walkinside. The high-performance 3-D visualization software virtually but realistically maps systems of any complexity before their commissioning. The software draws directly on the data stored in COMOS. The 3-D image of the system is always kept up-to-date, throughout the complete lifecycle, by means of logical combinations of geometric objects with engineering data. The use of headmounted devices (HMDs – virtual reality glasses) and gamepads for the control of virtual characters creates an almost perfect impression of being inside the actual plant.

For every component in the plant, from valves to pipelines to pumps and motors, actual information can be accessed in the virtual

Interview with **Jan Rougoor,** Head of Product Management COMOS Industry Solutions

Even more efficiency – with the version COMOS 10.1

Plant Manager: The version COMOS 10.1 was published at the end of the last year – which highlights do our customers have available?

Rougoor: One important highlight of the current COMOS version is the new industry database COMOS iDB that was further developed based on our COMOS Enterprise platform. It is designed for sector-specific requirements in a wide variety of industries. New projects can be installed quickly and easily, because fewer customer-specific adaptations are required. This ensures fast data processing and reliable data management even with a growing volume of project data.

Another highlight is the further development of the integration of COMOS with our Siemens process control system SIMATIC PCS 7 that allows planners and plant operators central data management from planning and automation right through to operation. The great advantage here is the consistent and bidirectional exchange of information between the two systems that significantly reduces the time and costs of the overall plant planning. For example, sequential controls, types and

instances functionally engineered in COMOS can now be transferred to a plant-specific automation function.

We must also not forget all the new functionalities of COMOS Walkinside such as a complete „out-of-the-box" framework for the integration of COMOS and COMOS Walkinside or various HSE effects, for example for simulating fault situations that can be activated directly by the instructor during operator training.

Plant Manager: You have already mentioned the integration with SIMATIC PCS7 - are there other Siemens-internal developments?

Rougoor: Indeed there are. To improve the exchange of information between product and plant design, there is a new process data interface with which our customers can synchronize components and catalogs between COMOS and Siemens PLM (Product Lifecycle Management) software team center. Plant structures from the 2D plant engineering with COMOS are consistently matched and exchanged with the NX solution for 3D product design based on the team center.

Plant Manager: We have heard that in May another new COMOS innovation was released this month. What can you tell us about this?

Rougoor: That's right. The significance of smartphones and tablet PCs for efficient plant management has grown enormously in recent years. Our new product family „COMOS Mobile Solutions" is the response to these developments and allows work to be performed worldwide within the framework of plant projects throughout the entire value added chain. Mobile data management using tablets and Web-based access to all relevant information ensure that all stakeholders can communicate with each other optimally at all times. In short: COMOS Mobile Solutions simplifies worldwide cooperation and access to COMOS data and documents thanks to slim solutions with a high degree of usability. Even unpractised users have fast and reliable access to COMOS information. In addition to this, significantly reduced release cycles ensure that new innovative features can be brought to market even earlier.

Plant Manager: This really does sound like development in the fast lane. What can our customers expect in the future?

Rougoor: After publishing version 10.1, version 10.2 is now on our roadmap. We are also permanently working on general further development of COMOS. What is important to us is to maintain the identity of COMOS, the so-called „object-oriented approach"; in other words there is a data object in the database that corresponds to every process object and on which the process object can be mapped. We are also reacting to the needs of the market by keeping our „as is documentation" up to date to be able to guarantee the latest data at any time. COMOS will react to this optimization requirement appropriately. But I don't want to give you too much detail; we need to keep something back for the next editions of Plant Manager.

Watch the video „The COMOS Mobile Document Review App"

Read the press release of COMOS Mobile Solutions

Tips and tricks – ask Doc COMOS

COMOS Snapshots – for fast data access

As of COMOS Version 10.1 Release 2, there is a new method of accessing data in COMOS quickly and efficiently: COMOS Snapshots.

With COMOS Snapshots, you obtain an image of a COMOS query that has already been created. This image is stored separately and allows you fast access to COMOS data. You can reach the snapshots in different ways: One way is to use a plug-in in the COMOS menu or directly using the relevant query. Or you start COMOS Snapshots using a separate application that ships with COMOS without starting COMOS. With the separate application, however, you can only display the data.

The advantage of COMOS Snapshots: You can create the images manually or auto-matically.

A manually created snapshot is a one-time image of your COMOS data. Since the exe-cution time varies depending on the size of the underlying query, you have the option here of having the creation of the snapshot

run in a separate process so that the entire application is not blocked during the time required to create the snapshot.

The automatic creation of snapshots provides you with further options: You can specify a creation period. This is either the time at which the snapshot is created daily. Or you specify a number of hours/minutes after which the snapshot will be created.

To prevent a large data collection of snapshots accumulating, you can store a runtime for each individual snapshot.

With the plug-in, you have the option of navigating from a selected snapshot to the original query in COMOS.

You also have the option of navigating within the snapshot from a line to the relevant object in COMOS.

And you can also edit single or multiple objects using COMOS snapshots.

The basic technology such as filters and sorting is, of course also available.

The following video shows you:
- How to create a manual and an automatic snapshot.
- An overview of the snapshot directory.
- Working with snapshots
  – From the plug-in
  – From the query
  – Navigating to objects
  – Editing objects

Video: (3:20 minutes)

Event Calendar 2014:

Numerous events covering all aspects of COMOS take place around the world all through the year. Just have a look at our current Event Calendar and pick out the right event for you. You can find more detailed information on each event under "more".

We're already looking forward to your visit!

September			
FIATECH Member Meeting	Sep. 29. –Oct. 01.	Hotel Monaco, Philadelphia, PA, USA	> more
October			
GetEnergy VTEC Global	Oct. 06.– 08.	Lone Star College, Houston, TX, USA	> more
Digital Plant Congress	Oct. 07.– 08.	Vogel Convention Center, Würzburg, Germany	> more
Scanautomatik& Process Technology 2014	Oct. 07.– 09.	Gothenburg, Sweden	> more
COMOS Day Salvador	Oct. 16	Hotel TBD, Salvador, Brazil	> more
November			
Enterprise Asset Management 2014	Nov. 11.– 12.	Copenhagen, Denmark	> more
Jahrestreffen der ProcessNet-Fachgemeinschaft "Prozess-, Apparate- und Anlagentechnik" (PAAT)	Nov. 17.– 18.	Seminaris Hotel, Luneburg, Germany	> more
SPS/ IPC Drives	Nov. 25.– 27.	Nuremberg, Germany	> more
December			
Spar Europe	Dec. 08.– 10.	Amsterdam, Netherlands	> more

If you would like to receive detailed information regarding an event, please do not hesitate to contact us.

Your opinion is important to us!

We would like to continuously improve the quality of the COMOS Plant Manager. Therefore the feedback of the readers is very important to us.

Which article suits you well and which article did not fit your expectations? Do you have special contents we should report about? Please send us your feedback. Either you tick one of the faces ☺ = very good article, ☺ = article was interesting, ☹ = article did not fit my expectations, or you write us your comments in the specified field. Afterwards click the send button and your feedback is on the way to us. Thank you for your cooperation.

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☺ ☺ ☹ | ⊠ Process plant planning: Reference CAC

☺ ☺ ☹ | ⊠ ARC White Paper

☺ ☺ ☹ | ⊠ The COMOS Business Value Calculator

☺ ☺ ☹ | ⊠ Hannover fair 2014 in retrospect

☺ ☺ ☹ | ⊠ New Release COMOS 10.1

☺ ☺ ☹ | ⊠ Tips and tricks – ask Doc COMOS

☺ ☺ ☹ | ⊠ Event Calendar 2014

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COMOS Plant Manager
September 2014

COMOS Plant Manager

COMOS – Making data work.

Edition September 2014

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Oil & Gas Industry
Reference Aker Solutions

Process plant planning
Reference Chemieanlagen-bau Chemnitz GmbH (CAC)

ARC White Paper
Improving Profitability of Life Sciences Industries

Release COMOS 10.1
Interview with Jan Rougoor, Head of Product Management

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www.siemens.com/comos