

Siemens' COMOS FEED Solution Increases Engineering Efficiencies

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Summary

In today's dynamic market environment, plant engineering companies face increased competition for projects not only from traditional regional competitors but, increasingly, from international competitors. Additionally, their customers are pushing them to reduce project pricing and to accept compressed project schedules, all the while maintaining the highest levels of engineering integrity and quality.

ARC estimates that approximately 80 percent of plant capital costs are fixed in the early stages of a design, positioning an optimized approach to front end engineering and design (FEED) as a key function to reduce these costs and provide significant business benefit across the engineering lifecycle.

ARC 's recent Process Engineering Tools Worldwide Study identified **ease of use, data quality, data consistency, data transparency** and **product support** as important features that users look for when selecting front end engineering design (FEED) tools. The Siemens COMOS FEED solution helps ensure consistent engineering data using an object-oriented infrastructure to provide "a single version of the truth."

The Siemens COMOS FEED solution is unique as it can be used either in conjunction with the total COMOS integrated software portfolio or as a standalone engineering solution to improve data transparency, data consistency, and engineering knowledge management.

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Asset Lifecycle Management

Companies in nearly every vertical industry have invested in building new assets or revamping existing assets to meet shifting market demands. This is especially true in the energy-related segments, particularly in emerging economies like Brazil, India, and China. ARC expects this to continue over the next few years, putting collective pressure on EPCs and



Key decisions made in the FEED stage significantly affect process capabilities and determine downstream engineering activities. **Approximately 80 percent of the total cost of a project is fixed during the FEED stages.**

owner/operators to improve engineering efficiencies, shorten project schedules, reduce costs and assure regulatory compliance. To this end, virtually all process industry segments use process engineering tool (PET) applications. Engineering companies that utilize PET solutions can achieve key business differentiations such as

faster, more efficient and innovative project execution through global project work share. These companies can also find a distinct competitive advantage through the application of reusable designs.

Creating, expanding, and operating an asset across its lifecycle entails specific engineering functions at each stage.



Asset Lifecycle Management

Conceptual design is where the scope of the project is defined and alternative process scenarios evaluated. Preliminary engineering work is performed to determine the feasibility and economics of each option. Evaluating alternatives typically involves process design, simulation, and economic analysis to establish the most viable process approach. The most common deliverables are project definition, process flow diagrams (PFDs), and preliminary project cost estimates.

Basic engineering expands upon conceptual design and includes greater detail and more refined cost estimation. This includes P&IDs, detailed process engineering, equipment lists, and functional diagrams.

Because the early phases of the engineering project are so important, users place considerable emphasis on integrating the workflow and information from the conceptual and basic design phases to improve quality and design and compress schedules.

Benefits of an optimized FEED approach include improving engineering efficiencies, compressed schedules with reduced construction and operations costs, and increased availability and consistency of plant data. In the end, this should lead to an overall reduction in the capital cost of the asset.

Siemens COMOS

Siemens COMOS was designed to support end-to-end plant asset management (PAM) across the complete lifecycle. The central COMOS data platform can provide plant design engineers, plant operating personnel, company management and solution partners with a continuous flow of

data across all project phases, helping to improve workflows, productivity, and data quality.

Siemens COMOS provides an integrated software solution that supports process engineering, automation, and operations using object-oriented data management. The complete plant information is stored in a central database. As a result, all disciplines and departments involved in the engineering and operating phases always access the same data for a given object. Changes to objects or documents are thus available to every user directly within the relevant engineering document.



The Siemens COMOS Solutions Concept Spans from Integrated Engineering to Integrated Operations

Siemens COMOS maps the full lifecycle of today's plants or equipment, enabling access to project assets across the complete lifecycle of an industrial plant and its equipment. The platform provides plant engineers, construction companies and operators with a seamless information flow of all project-relevant data.

Siemens COMOS incorporates asset lifecycle management (ALM) into four areas. The COMOS Platform provides the infrastructure for the application

suite. This enables use of common components for the COMOS Process, Automation, and Operations solution modules.

Siemens COMOS Front End Engineering Design (FEED)

The Siemens COMOS FEED solution inherits all the capabilities built into the COMOS platform. This enables consistency of data and speed to process design. Other features include:

Object orientation in the Siemens COMOS environment describes an existing component and its true-to-life graphical representation. The graphical and alphanumeric manifestations within the database constitute a single entity – the object.

- **Knowledge management** enables information and engineering intelligence to be imported from multiple sources and includes mechanisms and rules that identify any data inconsistencies.
- **Workflow and workflow management** controls the individual steps within a workflow in accordance with the schedule stored and provides or requests the data required for this purpose.
- **Automated data transfer** allows for the ability to generate P&IDs with integrated intelligent symbols and also includes the ability to manage data and knowledge by bringing data and graphics from the PFDs to the P&IDs.
- **Third-party interoperability** allows data to be imported and managed from many leading simulation programs. The COMOS FEED solution can be used to determine the quality and reliability of the integrated data by providing a knowledge base for checking data that the user imports.
- **Standardized user interface** for simulation and calculation tools enables process engineers to import or enter the correct information the first time. The use of standard interfaces saves process engineers from doing re-work.
- **Data reuse** allows users to easily compile the desired scope of reusable data, including the structure and rules from one document or project to another.
- **Data consistency** means data is entered only once and is then available to all stakeholders anytime and everywhere depending on the user rights (e.g., read-only, read/write, and invisible). Any changes made to



FEED Offers an Integrated Approach to Data for Accuracy, Quality, and Integrity

an application are immediately available to everyone. The software incorporates intelligent rules for identifying inconsistencies early on in the project so that errors in the downstream engineering process can be avoided.

- **Data integration and verification** bring information together from various data sources for constructing a common data with a standard structure including a sophisticated case and variant management.
- **Parallelization and working layers** enable different views of the same plant data. Thus, engineering data and plant objects can be processed by several users in parallel, without changing the original database of the plant. Mutually independent activities can be processed concurrently and interdependent work steps can be overlapped while exchanging information to help accelerate process engineering.
- **3D integration** is available as an additional option. This helps ensure data integrity between 2D deliverables and 3D engineering graphics with the COMOS 3D integration products.
- **3D visualization** is available as an additional option, enabling integration with downstream engineering and allowing information to be displayed in 3D.

Conclusion

Increasingly, today's EPCs and owner/operators recognize the importance of taking a lifecycle approach to managing both industrial assets and the information associated with those assets. The consistent, object-oriented approach of the Siemens COMOS FEED Solution combines high efficiency with advanced ease of use, helping to ensure superior engineering data quality. By adopting solutions like Siemens COMOS FEED, engineering firms and owner/operators can help optimize both asset lifecycle management (ALM) and asset information management (AIM).

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