



FACTS AT A GLANCE

Company: Sinopec Engineering Inc.

Website: www.sei.com.cn

Description: China Petrochemical Corporation (Sinopec Group) is Asia's largest oil refining and petrochemical enterprise and the world's seventh biggest company in terms of revenue. One of Sinopec Group's ventures is Sinopec Engineering Inc. (SEI). SEI is a leading engineering firm performing PMC and EPC projects and offering professional project management services.

Revenue: \$261.5 million

Employees: More than 2,200 employees

Industry: Oil and Petrochemical

Country: China

PRODUCTS USED

- SmartPlant 3D
- SmartPlant Foundation
- SmartPlant Instrumentation
- SmartPlant Materials
- SmartPlant P&ID
- SmartPlant Reference Data
- SmartPlant Review
- PDS®

KEY BENEFITS

- Design integration
- Optimized workflows
- Complete 3D plant intelligence model

SINOPEC TAKES THE NEXT STEP

INTEGRATION WITH SMARTPLANT® ENTERPRISE ENHANCES WORKFLOWS

IDENTIFYING GOALS

SEI recently used SmartPlant® 3D to lay out the structure, equipment, and piping models, including more than 1,000 pipelines, for the Maoming 300,000-ton polyethylene project.

Next for the Central Plains 60,000-ton OCC propylene project, SEI began a pilot project of the SmartPlant Enterprise software suite. SEI chose SmartPlant 3D to build the entire factory model. It generated 700 to 800 one-pipe isometric maps. The integrated applications included SmartPlant 3D, SmartPlant Foundation, SmartPlant P&ID, and SmartPlant Instrumentation.

In both projects, SEI also used SmartPlant P&ID to draw a flow chart and map the SmartPlant P&ID drawings. This helped SEI to complete about 200 flowcharts in the OCC project.

OVERCOMING CHALLENGES

Sinopec Shanghai Research Institute of Petrochemical Technology (SRIPT) and SEI worked in cooperation to develop the Zhongyuan OCC project, featuring a C4 olefins catalytic cracker to produce 60,000 tons of propylene. There were more than 50 equipment units, including compressors, and more than 400 pipelines. The project included process, piping, almost all engineering structures, containers, pumps, instrumentation, electrical, and waterways. This made the project very suitable for a software integration pilot program.

REALIZING RESULTS

SEI enjoyed the flexibility that SmartPlant P&ID offers to develop the P&IDs. The process department used SmartPlant P&ID to draw 18 intelligent P&IDs in the integration pilot project. SEI customized some special symbols, reports, and properties. It inputted the equipment, pipelines, instrumentation, and other attribute data into the P&IDs. From SmartPlant P&ID, the team could output the P&ID drawings, equipment data sheets, pipeline table, instrument index table, and other finished products, to ensure that the data was accurate when sharing the finished products.

Piping professionals used many SmartPlant 3D features to meet project needs, but thanks to the depth of the integrated software, they could go a step further. The OCC project used SmartPlant 3D for smooth piping database creation and

maintenance. The software handled equipment, piping, instruments, and structures, plus cable tray layout design.

Users reported that SmartPlant 3D is more intelligent and easier to use than older systems introduced in the 1970s and 1980s.

SEI can establish a more complete 3D plant intelligence model to generate nozzle platform diagrams, single-line diagrams, piping layout, equipment layout, and other items required for a variety of conditions and the finished model. Users can also perform collision checking and create an output materials report.

In addition to further deepening the development and use of design software, SEI found that design integration was one of the most important benefits of SmartPlant Enterprise. The test strategy for an integrated environment included phased implementation of the integration capabilities to the standard software to develop a customized solution, supplemented by gradual improvements.

The default out-of-the-box environment opens up the integration between the various solutions. The process data from SmartPlant P&ID passes through SmartPlant Foundation and then goes to SmartPlant Instrumentation for instrumentation design. The instrument geometry data from SmartPlant Instrumentation goes to SmartPlant Foundation and is then passed to SmartPlant 3D to create the instrument components model. The process data from SmartPlant P&ID can also pass through SmartPlant Foundation and then to SmartPlant 3D. Users can click on the P&ID to see the pipeline data for the effective design of piping, valves, and other components. They can also click on the P&ID to see the SmartPlant 3D materials database.

The customized systems integration environment helped the team successfully perform pipe grading, insulation/heat tracing levels, fluid codes, and the expansion of user attributes, such as pipeline levels. With the P&ID, the team benefitted from version updates, 2D and 3D calibration, and data updating that were convenient, efficient, and accurate.

Concurrent testing of integrated applications enhanced the depth of understanding of the workflow design software for the professional collaboration and the integration of some deep-seated features. In taking a look at the existing division of labor, the team could further adjust and optimize the division of professional labor and collaboration.

Integrated applications can significantly improve design efficiency, especially in design revisions. When versions are updated, the system automatically checks to ensure that the design is complete, efficient, and accurate.

As the project progresses, the team will further test the functionality of the integrated system, including expanding the scope of integration and testing the integration between AspenTech Zygad and Microsoft® Excel®. SEI will optimize integration with front-end design and data input into the business management functions and will integrate its system with other software, including PDMS, Documentum, and in-house software.

MOVING FORWARD

SEI expects that SmartPlant Enterprise solutions will play a greater role in engineering design, changing the traditional design of organizational models and processes. SEI looks forward to closer collaboration with Intergraph and increasing its usage of SmartPlant Foundation, gradually establishing best practices in SEI to take full advantage of SmartPlant Enterprise.

ABOUT INTERGRAPH

Intergraph is the leading global provider of engineering and geospatial software that enables customers to visualize complex data. Businesses and governments in more than 60 countries rely on Intergraph's industry-specific software to organize vast amounts of data to make processes and infrastructure better, safer and smarter. The company's software and services empower customers to build and operate more efficient plants and ships, create intelligent maps, and protect critical infrastructure and millions of people around the world.

Intergraph operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I). Intergraph PP&M provides enterprise engineering software for the design, construction, operation and data management of plants, ships and offshore facilities.

Intergraph SG&I provides geospatially powered solutions, including ERDAS technologies, to the public safety and security, defense and intelligence, government, transportation, photogrammetry, and utilities and communications industries. Intergraph Government Solutions (IGS) is a wholly owned subsidiary of Intergraph Corporation responsible for the SG&I U.S. federal business.

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