SIEMENS

Energy and utilities • Industrial machinery and equipment

Zhejiang Fuchunjiang Hydropower

Comprehensive system integration – PLM, ERP and CAPP

Products

Solid Edge, Teamcenter, NX

Business challenges

Data traceability throughout the product lifecycle

Data sharing and design collaboration across sites

Limitations of 2D data in leveraging ERP, CAPP, FEA and NC programming

Keys to success

Successful implementation of Solid Edge, Teamcenter, NX, NX Nastran and NX CAM

User-friendly interface

System flexibility

Powerful sheet metal design and 2D drawing design capabilities

Seamless integration across technologies

Incentives to promote the use of the new solution

Hydropower manufacturer simultaneously deploys integrated technologies, resulting in a strong business process advantage

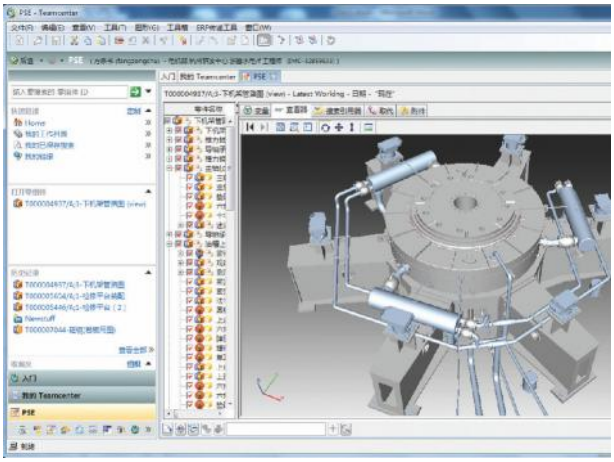
Specializing in water turbine power generating units

Founded in 1970, Zhejiang Fuchunjiang Hydropower Machinery Plant (Zhefu) is state-owned, with oversight by China's Ministry of Water Resources and Conservation. Zhefu developed the first water turbine power generating unit, Fuchunjiang Hydropower Station #3 Unit, which went into operation approximately 40 years ago. The company now specializes in the complete design and manufacture of medium- to large-sized water turbine power generating units. Zhefu is a leading manufacturer in its market segment, with annual sales of ¥*1 billion.

Hydropower equipment must be customized according to each application. There are a multitude of types and specifications. "Each hydropower generating unit must to be designed in accordance with the specific conditions of the power station," says Zhao Zhiqiang, deputy general manager at Zhefu. "Such non-standardization significantly impacts our business process, especially since we need to secure customer orders – get the contracts signed – by means of bidding."

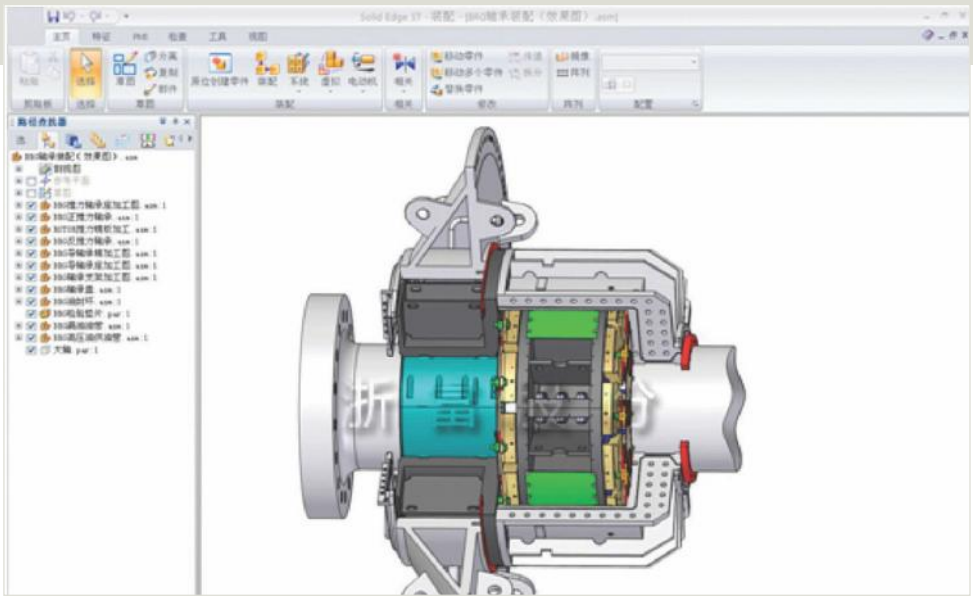
**The Renminbi (sign: ¥) is the official currency of the People's Republic of China. The principal unit is the Yuan.*

Zhiqiang explains, "Hydropower products are first developed by the Design Department, then inspected and approved by the Examination and Approval Department before finally being submitted to the Project Department, where materials are purchased, production begins, and the completed product is delivered and installed. Post-sale services are performed depending on customer requirements, which vary significantly from order to order. Moreover, technical preparation for production and manufacturing can be time-intensive, with many specifications and conditions changing during the process. For such a complex and extended lifecycle, the technologies and knowledge of the past are valuable, but they must be managed using advanced information technology."



View of the lower frame assemblies of this hydropower equipment using Teamcenter.

Assembly of the bearings of this hydropower equipment completed using Solid Edge with synchrous technology.



Results

Shifted from 2D to 3D design within target timeframe

Virtually eliminated assembly and fit tolerance errors

Improved designer productivity

Realized comprehensive system integration – PLM, ERP and CAPP

Overall business processes dramatically improved

Measurably reduced time and costs, with significant improvements still expected

Upgrading R&D for competitive advantage

Zhefu began using computer-aided design (CAD), computer-aided manufacturing (CAM) and computer-aided engineering (CAE) tools years ago. The company applied these tools to product research and development (R&D). However, the applications represented disparate systems from different vendors and were implemented to find immediate solutions to specific development issues. The CAD software was the most commonly used, but it was applied only in a 2D format.

Companies can be creative when applying resources, and Zhefu certainly is one such organization. The company was quite effective in juggling its assets, but management realized it had reached a point of diminishing returns and new tools would be needed to maintain its competitive position. "We knew that our product R&D process needed to be upgraded," says Zhiqiang. "We could see the industry evolving and we were determined to stay at the forefront."

So the company evaluated its product development environment, considering its entire scope and keeping an open mind to what would best meet its needs. "We wanted product data that is traceable during the entire product lifecycle, from R&D through design, processing, installation processes and post-sale service," says Zhiqiang. "And we wanted to be able to transmit the data across processes and across sites automatically and concurrently. Our objective was truly collaborative design. Then there were the unique product lifecycle management (PLM) needs of our hydropower equipment sector."

Considering its objectives, the company decided to fully implement PLM, enterprise resource planning (ERP) and computer-aided process planning (CAPP) systems, setting up a special center to advance integration between the systems as well as to facilitate its electronic business processes, which included automated data transmission. Zhefu was especially interested in building a completely digital product R&D platform.

Zhiqiang explains, "The requirements for the product R&D platform were clear and simple, that is, to upgrade the 2D CAD design system to 3D, standardize both national standard parts and enterprise standard parts, improve the quality of drawings and reduce costs. This, of course, meant requiring that the new product R&D platform be integrated across PLM, CAPP and ERP."

Strategic PLM project

In April 2009, Zhefu signed a long-term agreement with Siemens PLM Software, formally announcing the implementation stage of Zhefu's strategic PLM project. At that time, Zhefu management felt the company needed to significantly improve its administration of product data and its design change process, as well as to unify and optimize its CAD and CAE environments. The company viewed its challenges as a net positive in that it planned to implement the complete set of integrated solutions in one installment – Solid Edge® software, Teamcenter® software, NX™ software including NX CAM and NX Nastran® software. The company viewed Siemens PLM Software as the best technology partner to get the job done.

Like many other enterprises that implement PLM technology, Zhefu encountered the problem of introducing change across operations in which individuals were firmly entrenched in their work habits. While the company expected the new processes to result in remarkable productivity advantages from the enterprise perspective, it also realized that the departments and individuals affected would need to disassociate themselves from habits developed over the years and fully engage the new approach, especially important during the initial implementation of the PLM system.

"There wasn't any hesitation or rethinking about our technology decision," says Zhiqiang, "but we knew that we needed to convince the employees of the value of the new approach. Therefore, we formed a team of our most outstanding and experienced engineers, who completed the design of a set of products within a short period of time. This brought tangible evidence that the new system reduces the error rate, solves the problems of part assembly and breaks down the BOM data for rapid transmission; that data can be easily queried; and that multiple projects are readily integrated. Our immediate and measurable success encouraged engineers to use the proven Siemens-based product development environment. Within a short period of time, all engineers had mastered the skills relevant to their expertise. To foster adoption of the new system, we developed a practical roll-out plan that included various training methodologies, from self-paced to instructor-led."

Complete integration, fast implementation, outstanding results

"Due to the ease of use and flexibility of the Siemens PLM Software products, Solid Edge, Teamcenter, NX, NX Nastran and NX CAM were implemented smoothly," says Zhiqiang. In fact, Zhefu quickly and completely shifted from 2D design to 3D design. With the product data manage-

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Deputy General Manager
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Solutions/Services

Solid Edge
www.siemens.com/solidedge

Teamcenter
www.siemens.com/teamcenter

NX
www.siemens.com/nx

Customer's primary business

Zhefu is a specialist in the complete design and manufacture of medium- to large-sized water turbine power generating units, with annual sales of ¥1 billion.

Customer location

Hangzhou
China

Partner

United Digital Systems Co. (UDS)

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Deputy General Manager
Zhefu

ment (PDM) capability in place, Zhefu's entire development department was carrying out design work based totally on the integrated PLM solution. Zhiqiang adds, "With this system, not only is all of the data standardized and managed effectively, but we have also achieved effective integration with our ERP and CAPP systems. This is enabling PLM data to add significant value in terms of speed and process advantage to our other foundation technologies."

Zhefu is now able to turn NX 3D data into 2D drawings directly, thus ensuring accurately proportioned designs and minimum errors. Using the analysis tools provided by Solid Edge, engineering and technical personnel can perform acute interference analysis, avoiding assembly errors. And by using the processing function after assembly, fit tolerance errors are avoided.

"Reliable and seamless coordination between Solid Edge and NX provides Zhefu with a product line of the highest cost/performance ratio," notes Zhiqiang. "We use Solid Edge for conventional product design and drawing, and NX for the design of complex models and large assemblies, product analysis, processing and manufacture. All data can thus be shared, an improvement that not only enhances design efficiency, but also meets our design requirements at different levels, therefore creating more value."

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A real business process advantage

Zhiqiang concludes, "Modern enterprises operate under a backdrop of fierce global competition. Therefore, sharing the latest knowledge immediately across diverse sites, storing knowledge for easy access and repeated use, and integrating personnel, processes and knowledge in an organic manner has become critical to competitive viability. Siemens PLM Software's technology, with Teamcenter as the core of our PLM platform, enables us to maximize knowledge re-use and collaboration across disciplines throughout our organization. Teamcenter made a seamless integration with ERP and CAPP possible. With Siemens' technology, we have achieved a real business process advantage for the long term."

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