SIEMENS

Oil and gas • Industrial machinery

Flovel Group

Leader in hydropower equipment seeks world-class advantage

Products

Solid Edge, Teamcenter, NX, Femap

Business challenges

Reduce time-to-market

Synchronize information exchange between the planning, design, engineering, procurement, quality and production departments

Facilitate simultaneous information retrieval by disparate user communities within the organization

Keys to success

Scalable product data management (PDM) solution augmented with rigorous data security, design innovation and control capabilities

Centralized engineering database

Standardized design processes

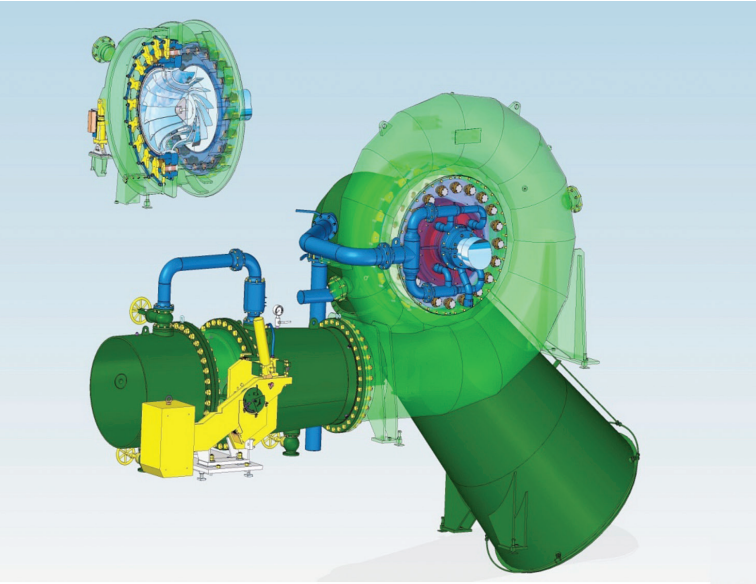
Extended capabilities, leveraging the latest CAD, CAE and CAM technologies, including for CNC machining

Siemens' PLM technology proves instrumental in achieving company's strategic vision; breakthrough gains achieved in time-to-market, cost reduction and cross-business unit operations

Company pursues ambitious vision

The Flovel Group is a fast growing, fully integrated hydropower equipment supplier that provides complete turnkey solutions for small- and medium-sized hydropower projects. Business units include Flovel Energy Pvt. Ltd., which specializes in the entire range of hydropower equipment and services for design, engineering, manufacturing, installation and servicing for all heads and outputs covering all types of turbines, including Pelton, Francis and Kaplan types in both horizontal and vertical orientation; and TB Hydro Flovel Valves Pvt. Ltd., which designs and manufactures a wide variety of inlet, shut-off, regulating and air valves for turbines. Flovel's manufacturing plant is 50 kilometers from its head office at the PALWAL district – Haryana.

Flovel is distinguished by its vision of becoming a world-class technology leader in the hydropower equipment marketplace – a company that outperforms its competitors in the rapid delivery of turnkey solutions. To accomplish this, Flovel's



Francis Turbine.

Results

Reduced product design time and overall development cycle

Achieved faster, more accurate information searches

Improved cross-discipline collaboration

Significantly reduced design errors

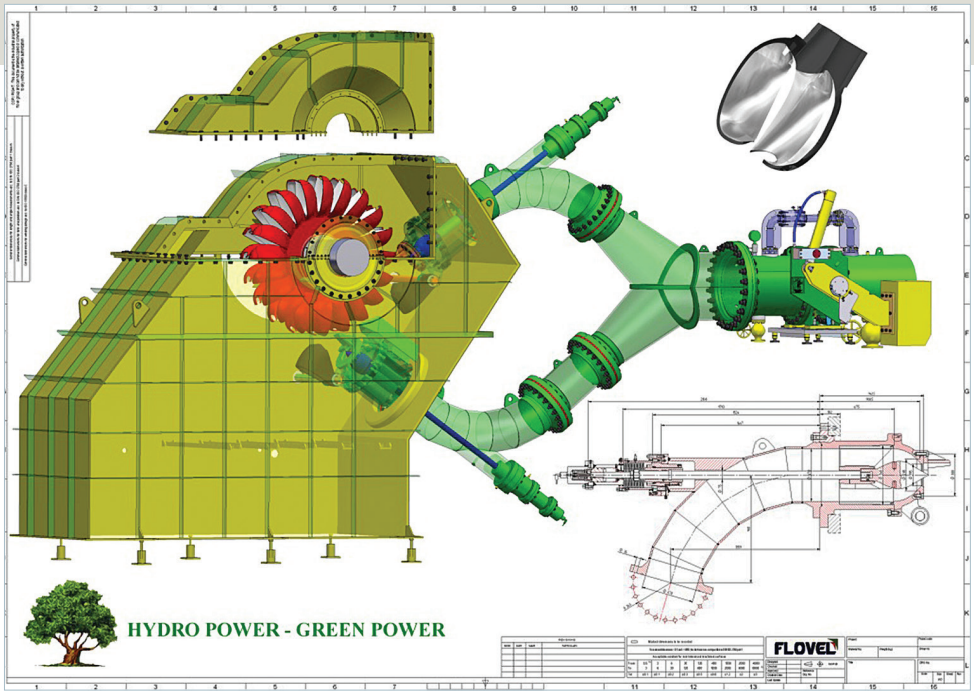
Substantially reduced design costs

New technology roll-outs well underway

Achieving strategic vision of world-class advantage through product development

"Siemens' PLM technology has delivered significant business results, especially in terms of our competitive advantage in achieving the highest quality products and with a global reach."

Arun Gupta
General Manager
Design and Engineering
Flovel Group



Pelton Turbine with BFV Valve.

management began to look for product development technology that was adept at accelerating the release of highly customized, innovative new products to market, while at the same time being able to ensure the high quality and rigorous accuracy required by its customer base.

Just as importantly, Flovel wanted technology that was able to meet two additional requirements. The first was to facilitate close collaboration and information re-use across all of the key disciplines involved in Flovel's product development process (including its planning, design, engineering and production departments), overcoming the physical separation between various functions, such as the design center and manufacturing plant.

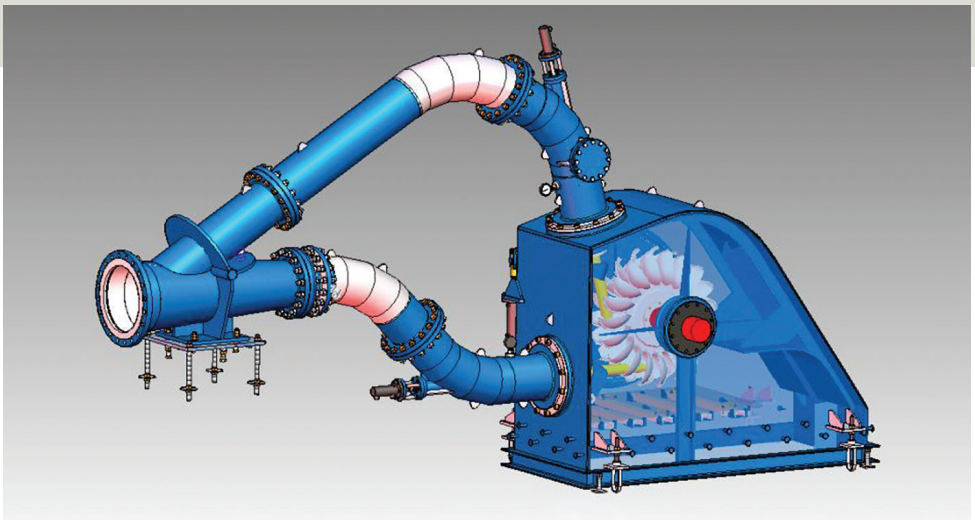
The second was to improve collaboration between Flovel's business units, so that they could share access to released data and leverage their manufacturing facilities to support computer-aided manufacturing (CAM) for computer numerical control (CNC) machining.

To meet its requirements, Flovel selected key products from Siemens PLM Software's portfolio, including Solid Edge® software, Teamcenter® software (preconfigured for rapid deployment and fast return on investment), NX™ software and Femap™ with NX Nastran® software.

Solid Edge improves product design

As the first step in its initiative to improve product development, Flovel selected

Using Solid Edge, Flovel has significantly improved its overall design methodology and cut costs.



Pelton Turbine.

"Our new processes, based on Siemens' solutions, are ideally suited to meet the needs of our organization in bringing complex, customized turnkey solutions to the marketplace quickly."

"We consider the Siemens PLM portfolio instrumental to our strategic vision."

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General Manager
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Solid Edge as the platform for its design process. Specifically, Flovel wanted to use the powerful computer-aided design (CAD) capabilities of Solid Edge to design complex turbine parts. Flovel's management representatives based their decision on the software's ability to handle sophisticated designs, its production-proven 2D functionality, and its superior sheet metal handling capabilities.

Equally important, Flovel's procurement team was impressed by the system's proven low cost of ownership and by the excellent feedback from industry counterparts who were current Solid Edge users.

Therefore, Flovel implemented Solid Edge as its base CAD platform. Based on the selection criteria and excellent value, Solid Edge is proving management's decision was the right choice. In fact, management is already looking to leverage Solid Edge in other areas, including CAE, CAM and product lifecycle management (PLM).

Using Solid Edge, Flovel has significantly improved its overall design methodology (concept to prototype to product) and cut costs (due to a better understanding of 3D conceptual prototypes). The company cites outstanding ease of use compared to traditional approaches to design, noting that the user-friendly Solid Edge is fostering idea generation and innovation. Flovel also gives Solid Edge (in conjunction with Teamcenter) high marks for superior searching options for making assemblies, and points out that the visualization capabilities of Solid Edge measurably accelerates the handling of large assemblies.

Teamcenter advances collaboration

Once Solid Edge was in place, Flovel implemented the second step in its product development initiative by adopting Teamcenter as its collaborative product data management (cPDM) solution. The goal was to establish a scalable cPDM solution that would facilitate collaboration between all of the key disciplines in the company's product development operations. The procurement team selected Teamcenter for a variety of reasons, including its superior visualization and collaboration capabilities, its strong multi-CAD and multi-site support capabilities and its ability to streamline the company's entire design process.

With Teamcenter, the company wanted its planning, design, engineering, and production departments to establish a synchronized engineering database with design information that users could easily access, share and exchange on a secure and controlled basis. Mission accomplished.

The company wanted its users to use Teamcenter to establish drawing number controls and materials codes, identify the latest versions of their design information, and disseminate this information in stan-

dard workflow-driven design processes. The company specifically wanted standard, up-to-date information, such as what is contained in product catalogs, quality standards, manuals and plans, to be kept in Teamcenter for immediate user access. On both counts, mission accomplished.

Beyond this, Flovel engaged Teamcenter to manage released design information, so that it can be leveraged by all of the company's business units and their manufacturing operations for purposes of improving its CAM/CNC machining processes. Again, mission accomplished.

PLM delivers excellent results

Working with Siemens PLM Software's local partner – Ryanus Consulting (P) Ltd. – Flovel implemented its initial Solid Edge solution in two months. Flovel experienced similar success with its Teamcenter deployment.

"Siemens' PLM technology has delivered significant business results, especially in terms of our competitive advantage in achieving the highest quality products and with a global reach," says Arun Gupta, general manager, design and engineering, Flovel Group. With both a new design process and a new engineering change process in place, the company is re-using product designs on a far more effective basis, and its CAM/CNC operation and time-to-market turnaround are already tangibly improved.

"Our new processes, based on Siemens' solutions, are ideally suited to meet the needs of our organization in bringing complex, customized turnkey solutions to the marketplace quickly," says Gupta. "Using Solid Edge, we have substantially reduced our design time and the overall length of our design cycle for developing new products. And with Teamcenter, users across all of the company's disciplines are now able to find the design information they need much more quickly. With Siemens' technology, manufacturing costs have decreased as design errors are caught earlier in the product lifecycle, virtually eliminating the negative ripple effect that errors cause on downstream productivity." Gupta notes, "Most importantly, using the integrated products of Siemens' PLM, we are achieving our vision of becoming a world-class technology leader in the hydropower equipment marketplace."

> "Siemens' technology has proven itself highly beneficial to both our short-term and long-range goals."
>
> Arun Gupta
> General Manager
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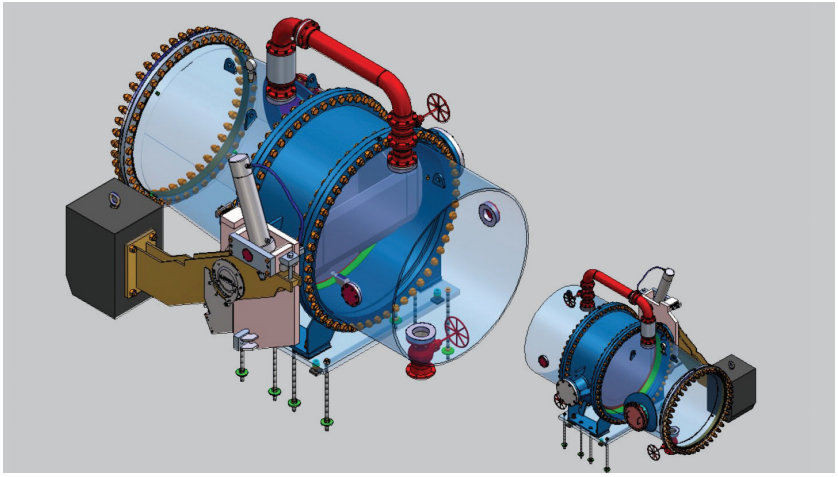
Capabilities extended with NX and Femap with NX Nastran

Flovel has extended its design process capabilities by implementing NX, which is enabling designers to model difficult surfaces like runner blades more easily. "We



Butterfly valve.

Solutions/Services

Solid Edge
www.siemens.com/solidedge

Teamcenter
www.siemens.com/teamcenter

NX
www.siemens.com/nx

Femap with NX Nastran
www.siemens.com/plm/femap

Customer's primary business

The Flovel Group provides an entire range of hydro-power equipment and services for designing, engineering, manufacturing, installing and servicing for all heads, output devices and valves for a wide range of turbines, including the Pelton, Francis and Kaplan type. It also provides renovation and upgrade services for these turbines.
www.flovel.net

Customer location

Faridabad
India

Partner

Ryanus Consulting (P) Ltd.

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are particularly impressed with the sophisticated freeform shape modeling capabilities of NX," says Gupta. "Moreover, Solid Edge and NX provide a great balance, depending on the project. We view them as quite synergistic."

The company has also implemented Femap with NX Nastran. Femap is a robust finite element modeling pre- and postprocessor application that is tightly integrated with NX Nastran, a well known industry-standard CAE modeler and solver. The intent of this deployment is CAE design optimization.

Currently, Flovel is using Femap with NX Nastran to analyze complex components, which Gupta notes isn't feasible using conventional calculation tools. The company is performing finite element analysis (FEA) on turbine components for customized applications and operating conditions, as well as using the software to verify designs developed using conventional design tools. Finally, it has engaged Femap with NX Nastran to continuously achieve a highly advanced, efficient and integrated design/analysis environment.

In addition, Flovel plans to extend its use of Teamcenter to other organizations, as well as integrate the company's enterprise resource planning (ERP) system into its product development initiative.

"Siemens' technology has proven itself highly beneficial to both our short-term and long-range goals," explains Gupta. "We consider the Siemens PLM portfolio instrumental to our strategic vision."

Siemens Industry Software

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