

Aerospace and defense

JSC LEPSE

Russian aerospace firm significantly improves productivity using solutions from Siemens PLM Software

Products

Solid Edge, NX, Teamcenter

Business challenges

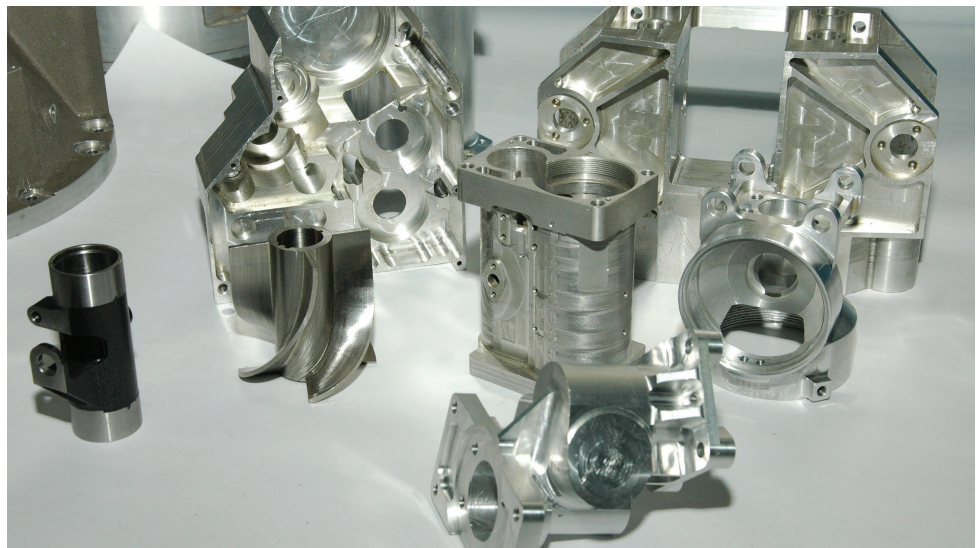
Improve product quality
Reduce the time it takes to manufacture products
Create a common information database at the enterprise level

Keys to success

Integration of Solid Edge, NX CAM and Teamcenter with ERP system
Modernization of design preproduction
Implementation of concurrent engineering processes

Results

Reduced design time and improved production quality
Optimized use of enterprise information technology resources
Upgraded milling equipment efficiency
Substantially improved collaboration
Enhanced innovation



Reducing design time while improving innovation and quality

Aircraft electrical equipment specialist

The JSC Electric machine building plant LEPSE (JSC LEPSE) manufactures aircraft electrical equipment that can be found in every Russian production aircraft. The plant manufactures more than 600 types of aircraft electrical components, such as alternating and direct current generators, electric motors, multiplexing equipment and electric motor starting systems. JSC LEPSE takes products from design and manufacturing to testing and after-sales service.

Software of choice

During the dynamic development of JSC LEPSE in the early part of the century, the company realized it needed to enhance its competitiveness by improving quality and reducing production schedules. The company recognized that having the right computer-aided design (CAD) system was critical to this effort. "We analyzed several solutions with three criteria in mind," says Dmitry Emelyanov, deputy head of the JSC LEPSE Information Technology Directorate. "The CAD system needed to support the full product lifecycle within the framework of a unified software solution; it needed to be compatible with the computer-based documentation format used by our outside

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Dmitry Emelyanov
Deputy Head of Information
Technology Directorate
JSC LEPSE



contractors; and as we wanted to integrate it with information management and control systems at the enterprise level, it needed to be feasible that we could integrate it with our ERP (enterprise resource planning) system.”

Based on the evaluation, JSC LEPSE determined that the best approach to meets its needs would be to adopt product lifecycle management (PLM) technology from Siemens PLM Software. Solutions included Solid Edge® software for new product and die mold development, NX™ software for computer-aided manufacturing (CAM) to manage numerical control (NC) machines

and Teamcenter® software for complete product lifecycle management.

“Siemens PLM Software’s products are the standard for the aircraft industry in Russia,” says Emelyanov. “The largest aircraft manufacturers in Russia as well as many of our suppliers and partners have been operating very effectively with NX and Teamcenter for a long time.”

Getting off to a solid start

NS Labs Company (located in Nizhny Novgorod), a Siemens PLM Software partner, is the systems integrator for JSC LEPSE. NS Labs has significant experience

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in implementing software solutions in the aerospace industry. "We started with Solid Edge," says Emelyanov. "It was quickly adopted without any problems. The product is fully localized. Also, the specialists for the CAD implementation organized training to teach us the new technology. The 'trainers' were our employees, who completed full-time authorized training coursework with certified NS Labs instructors."

Alexander Struchkov, general director of NS Labs, notes, "Our company always trains the customer's personnel to operate the system and implement its required components. We conduct regular training and provide curricula for engineers of JSC LEPSE, taking into account the specialties of electric machine building production."

Reducing errors

After the CAD training was completed, the full-scale pilot project for the design of components for Russian military aircraft was launched at the enterprise level. Its purpose was to use Solid Edge to implement design techniques, including the technical documentation approval process. As a result of the pilot project, engineers became confident that Solid Edge would allow them to more efficiently create simulation models of parts, assemblies and tooling.

"The 3D simulation methodology worked out during the pilot project established

the fundamentals for creation of 3D models and associated release of drawings," says Emelyanov. "Moreover, we optimized the principles of interaction between divisions in the course of design preproduction."

JSC LEPSE was able to implement an enterprise-wide master model during the deployment of Solid Edge. The master model drove tooling design, NC programming machines and engineering evaluations. All required projections are generated based on 3D models.

"This approach enables our specialists to significantly improve the quality of their work," says Emelyanov. "Application of associative links significantly reduces the quantity of errors during design planning, design updates and modification development."

The LEPSE Plant is designing and manufacturing other products using Solid Edge. For instance, the firm developed a medical device for extraction of ozone from oxygen in cooperation with Vyatsky State University. It is supplied to Russian medical facilities.

Optimizing resources

"During the first year the system was in use, about 20 products were developed and substantial data was accumulated," says Emelyanov. "Developing a common product data bank and establishing a

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General Director
NS Labs Company



timely process for change management became vital issues, so we used Teamcenter to create a common information source.”

The use of Teamcenter enabled JSC LEPSE to standardize its process for filing engineering documents. As the product lifecycle in the aircraft development field frequently lasts 30 or more years, official records (design, assembly, shipping) need to be kept for a long time.

“We worked jointly with NS Labs specialists to develop the module that provided the

transfer of parts, material reference books and other information from our home-grown, enterprise-level ‘Saturn’ management system to Teamcenter,” says Emelyanov. “Data is transferred automatically and the process is synchronized. A common, digitized information source has been created in the plant.”

New part libraries, which are used in design preproduction, are integrated into the PLM system. Particularly, tooling, standard product and material reference books have been developed.

The implementation of Teamcenter helped significantly improve the efficiency of JSC LEPSE’s allocation of manpower: The PLM environment enables teams of specialists, such as designers, process engineers, and NC machine programmers, to work on a project in parallel.

“While the designer is working with the assembly and making updates, the process engineer may already start the tooling design,” says Emelyanov. “At the same time another specialist can prepare the NC

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Solutions/Services

Solid Edge

www.siemens.com/solidedge

NX CAM

www.siemens.com/plm/nxcam

Teamcenter

www.siemens.com/teamcenter

Customer's primary business

Joint-Stock Company Electric machine building plant (LEPSE) is one of the largest enterprises in Russia focused on manufacturing aircraft electrical equipment. Virtually all Russian airliners are equipped with products manufactured by the LEPSE Plant. www.lepse.com

Customer location

Kirov
Russia

Partner

NS Labs

www.nslabs.ru/software/sapr

programming. By adopting this concurrent process, we are able to minimize the need for corrective actions, such as updating complicated production tooling, and ensure improved product quality."

Increasing machine efficiency

Using Teamcenter helped enable LEPSE plant management to consolidate their designers, process engineers and tooling department into one integrated team. With milling operations based on 4- and 5-axis NC machines, use of the NX application programming interface (API) enabled the company to fully automate its programming process.

JSC LEPSE's plant engineers and NS Labs' specialists carried out the full range of projects for development, adjusting post-processors in compliance with the enterprise equipment. Their work was simplified by use of the special capabilities of NX CAM for the development, setup and editing of postprocessors.

Facilitating innovation

Siemens PLM Software's solutions enabled JSC LEPSE to significantly improve its manufacturing operations.

The use of Solid Edge enabled the replacement of 2D drawings with 3D models. The associative master model created by the designer became the basis for the concurrent sharing and operation of other departments. This approach reduced the preproduction period and substantially increased product quality due to fewer errors and tight project development.

The use of Teamcenter provided a common information framework for the enterprise. Using Teamcenter in conjunction with the company's "Saturn" ERP solution provided access to new standard

product and material libraries. This resulted in optimized resources, saving JSC LEPSE's specialists' time and making cooperation with the plant partners more efficient.

The use of NX improved the quality of operations across the design, engineering and tooling departments, because the company was able to fully automate program creation for NC machines.

"Using product lifecycle management technologies from Siemens PLM Software releases designers and process engineers from routine work and encourages innovation and the search for new solutions, while improving motivation and professional growth," says Emelyanov.

NS Labs believes another notable reason for JSC LEPSE's success was its decision to take a systemic approach to software: "Our team covered all core fields of design preproduction, including CAD, CAM, CAE, PLM and the automation of NC machines," says Struchkov. "By using Siemens PLM Software's products, we were able to address any issue holistically. That takes a lot of the worry out of integrating systems."

Struchkov notes that JSC LEPSE considers its collaboration with Siemens PLM Software to be a critical component of its plans for developing successful products and maintaining a marked operational edge going forward. Currently, JSC LEPSE, together with NS Labs, is launching the manufacturing capabilities of Teamcenter to automate its engineering process. The work includes developing a standard electronic model of technological processes and creating material reference books of equipment, technological operations and more.

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www.siemens.com/plm

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