OKB Aerospace Systems uses NX and Teamcenter to dramatically increase productivity

Innovation takes off
OKB Aerospace Systems (OKB Aerospace) is located in the Dubna, Moscow Region, one of Russia’s innovation clusters. The company is fostering innovation in the design of pneumatic aircraft systems by using NX™ software for advanced computer-aided design (CAD) and Teamcenter® software for complete product lifecycle management (PLM). Both solutions are from Siemens Digital Industries Software.

OKB Aerospace develops electronic airborne equipment and provides electric system architecture design, product development, manufacturing and operational documentation. Customers include leading Russian aircraft designers and manufacturers, including Irkut Corporation, Ilyushin Aviation Complex, Sukhoi and Kazan Helicopters.

Like much of the global aerospace industry, Russian companies are becoming more and more specialized and now outsource many tasks to subcontractors. The information exchange needed to support supplier collaboration requires a unified environment. This helps assure that the documentation meets customer requirements and complies with international standards.

The choice of NX and Teamcenter
“To be competitive, we needed to reduce development time and costs, which required us to introduce CAD and PLM systems on a large scale,” says Ilya Pizik, IT (information technology) department head, OKB Aerospace. “The primary
Results (continued)
Notably reduced product development time and costs, including eliminating multiple physical prototypes
Designed more compact, lightweight products
Delivering Russia’s first outsourced aircraft cable network

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OKB Aerospace engineers tested several commercial CAD and PLM systems, considering such factors as user experience, close integration between PLM and CAD, management of data authored using third-party software, requirements management capabilities, support for various project data formats, multi-user support, and integration with third-party CAD systems.

Based on their analysis, the company chose solutions from Siemens Digital Industries Software. “We considered multiple CAD systems for the highly special tasks our designers perform,” says Pizik. “Yet, most of the systems we tested lack the capabilities we need. Among the systems that did meet our requirements, NX offered the best performance and value.”

The company deployed the solutions using a multi-stage process. The initial software installation on personal computers (PCs) and servers, plus setup and testing, took about two months. The engineers used NX to perform new design projects at the same time they were training on its use and Teamcenter was being implemented.

“We are establishing business processes that meet company needs, customer demands and regulatory requirements,” says Pizik. “We decided to not only implement NX as a CAD system for developing digital mockups, but also Teamcenter as a product data management (PDM) system to establish a virtual development environment. It was important to customize the system to fit our organization and activities. We used Teamcenter to manage collaboration, streamline the multi-user development process and introduce the concurrent design approach to improve design efficiency and product quality.”

OKB Aerospace is completing the integration of the E3.series dedicated electronic CAD system with the Siemens Digital Industries Software solutions environment, enabling engineers to synchronize the data created using both technologies in real time.
“Thanks to NX, we no longer need to make multiple, expensive physical prototypes to check whether parts will fit, connect and operate properly.”

Pavel Vorobiev
Design Department Deputy Head
OKB Aerospace

Eliminating multiple physical prototypes
NX is used to create 3D models suitable for cable-length standardization and layout planning so that making multiple physical prototypes is no longer necessary. “NX is powerful enough to handle complete digital product mockups, which serve as a data source for developing design documentation for manufacturing the product,” says Pizik. “Digital models are then refined and product specifications and physical properties are analyzed.”

“Thanks to NX, we no longer need to make multiple, expensive physical prototypes to check whether parts will fit, connect and operate properly,” says Pavel Vorobiev, deputy head, design department, OKB Aerospace. “The final 3D model is 99 percent similar to the actual product, so almost no onboard rework is required. Changes to product models are made online and stakeholders can access any changes. We have found that this helps lead to smarter decisions and better products.”

Teamcenter helps OKB Aerospace manage product development and engineering changes from the initial requirements stage through product delivery. All information is stored in the system, with data access easy and secure. With the multi-site functionality of Teamcenter, OKB Aerospace is also using the system to exchange data with its customers.

During systems deployment, the company developed dedicated libraries and reference documents, including reliability and fault safety assessment procedures. The procedures have been integrated into the development process so that quantitative product reliability indicators can be obtained even during the earliest stages of design. Any deviations from requirements are identified in real time and the models are then modified accordingly.

Significantly reducing time needed to make product changes
“Using NX helps us dramatically reduce the time and effort needed to make project changes,” says Pavel Vorobiev, design department deputy head, OKB Aerospace. “We estimate that making project changes using NX is 85 percent faster than making such changes manually. When we do build a physical prototype, we don't have to.

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Ilya Pizik
IT Department Head
OKB Aerospace
Customer’s primary business
OKB Aerospace Systems
designs, upgrades and integrates electrical, hydraulic and pneumatic aircraft systems.
www.aerospace-systems.ru

Customer location
Dubna, Moscow Region
Russia

“‘The solutions from Siemens Digital Industries Software enable us to develop projects much faster.’”
Alexander Akimov
Vice Director General
Design Department Head
OKB Aerospace

measure the length of cables manually, which saves time and improves accuracy.”

“We have gained extraordinary experience and value using NX and Teamcenter,” says Alexander Akimov, vice director general, design department head, OKB Aerospace.

“The system we have established is ‘aware’ of every design detail and operational condition. The development process – from defining initial data to the complete design documentation release – is now fully automated. As a result, development and manufacturing time and costs have been reduced. Our products have become more compact and lightweight, and our systems meet quality and reliability standards and comply with electromagnetic interference (EMI) and strong radio frequency (RF) resistance regulations. We have also standardized manufacturing processes. The solutions from Siemens Digital Industries Software enable us to develop projects much faster, give us confidence on our future projects and help us expand into new areas of competence.”

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