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Energy & Utilities | Solid Edge

KONAR

# A leading Russian pipeline part producer expands product portfolio and wins new business using Solid Edge

Chelyabinsk, Russia

KONAR reduces design time, compresses change management and improves supplier/customer collaboration

## CHALLENGES

- Reduce product development turnaround
- Cut design errors while increasing product quality
- Increase business relationship with leading companies in the oil and gas industry

## KEYS TO SUCCESS

- Implement Solid Edge and changeover to 3D modeling
- Improve designers' CAD skills
- Increase data re-use
- Escalate collaboration with partners and customers

## RESULTS

- Reduced time needed to design complex products
- Improved speed and efficiency in the change management process
- Delivered new, innovative products for the oil and gas industry
- Organized digital exchange of information with partners and customers
- Increased professional level of specialists
- Won new oil and gas industry customers

## KONAR

KONAR is a highly renowned Russian enterprise that produces quality pipeline valves, flanges, fittings and parts.

http://www.konar.ru

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>
> *Dmitry Pryamikov,*
> *Leading Design Engineer KONAR*

## PARTNER HIGHLIGHT

PLM Ural

Complete solutions for industrial enterprises automation

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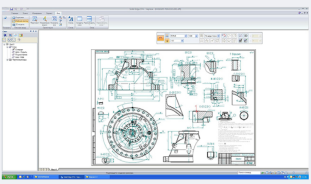
>
> *Evgeny Bodrov,*
> *Head of the Engineering Center KONAR*

## Business strategy aimed at drawing new customers

Established in 1991 and located in the Chelyabinsk region, KONAR is well-known in Russia for developing and producing quality pipeline valves, flanges, fittings and parts. Among KONAR's customers are large Russian oil processing plants, including Gazprom Neftekhim Salavat (Bashkortostan), Tuapse Oil Processing Plant, and Transneft. Among a long list of significant achievements, the company recently completed a large-scale joint project with Transneft, creating special pipe supports for Russia's tundra and permafrost regions.

KONAR's business strategy, which is aimed at attracting the leading oil and gas companies, necessitated a totally new approach to design preproduction, one of the most important areas of the company. After analyzing ways to improve this area of its operations, specialists at KONAR decided that the company needed to modernize its design technology, including introducing 3D-modeling, parametric design and a new generation of highly integrated computer-aided engineering (CAE) software.

"Working for oil and gas industry enterprises, we need to design products with a solution that utilizes a branched structure and complex geometry, as well as makes design re-use easy," notes Yevgeny Bodrov, the head of the enterprise's engineering center. "Upon completing a design, we have a large number of two-dimensional drawings, which are ineffective at visually presenting the final form of the product. Moreover, in making corrections, it's very difficult to simultaneously change a large number of drawings using a 2D CAD system because, very often, changing small parts results in the need to change ten or more product components. There is no such problem using three-dimensional (3D) modeling, because the whole set of drawings is closely related to the 3D product model. Changing the model automatically changes the drawings."



## Accelerated modeling, design data management, simulation and so much more

Having agreed that a 3D modeling system was essential to realizing its business strategy, KONAR's specialists set up a list of requirements for the system. In addition to specific computer-aided design (CAD) requirements, the list also included general requirements, including ease of implementation, national standards support and a user-friendly interface.

In assessing both domestic and international software solutions, KONAR experts enthusiastically favored Siemens Digital Industries Software's Solid Edge® software, especially after learning that the system is widely used at international enterprises that specialize in similar endeavors.

Bodrov spoke in detail about the advantages of the system: "Solid Edge undoubtedly has a lot of advantages: easy-to-use interface, speed, and the ability to build assemblies with unlimited nesting. Moreover, there are several unique features that favorably distinguish Solid Edge from other systems in its class. First, using the 3D modeling tool of Solid Edge, unlike using a system with a traditional history tree, allows designers to design in the familiar environment of the product structure. Second, the unique synchronous technology capabilities of the software provide the power of parametric design with the flexibility of direct geometry editing and ad hoc modifying. Third, the built-in tools of design data management and embedded mechanisms of finite element analysis (FEA) make Solid Edge not just a means of 3D model construction, but also a tool for managing the design process and performing simulations."

Dmitry Pryamikov, lead design engineer at KONAR, adds, "An important factor in the choice of Solid Edge was its excellent localization for Russian applications. Design drawings generated using Solid Edge are fully compliant with Russian ESKD (unified system of design documentation) standards."

At the final stage of the selection process, KONAR held an open test in which the company's specialists made 3D models of several test products using different CAD systems, comparing their speed, productivity and ease of use. The best results were demonstrated using Solid Edge.

With Siemens Digital Industries Software partner PLM Ural in the region, the company felt that a decision to go with Solid Edge would be augmented by high-quality implementation services, training at the partner's education center and consistent system support, including on-site technical consultation.

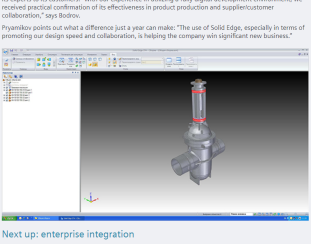
For these reasons, KONAR selected Solid Edge.

## Implementation leads to achievement of enterprise targets

"Successful implementation of automation tools takes not only the desire of management and IT (information technology), but the desire of the entire team of designers involved in the process," says Bodrov. "To be successful, we need to have a clear idea of what we want to get from a given software product and how it will solve the business tasks of a specific endeavor." According to Bodrov, management felt it was essential to engage the active participation of its designers in introducing the new software, with training deemed vital to this engagement. So even before course instruction began, a number of preparatory steps were taken. These included assessing the level of its designers' computer skills, with the training coursework adjusted based on the results of this evaluation. The training was also tailored to the KONAR's production processes, with the hands-on training based on real projects. The assessment and training were conducted by PLM Ural at its Yekaterinburg facility.

KONAR then established new best practices aligned with its new digitally driven 3D CAD system. User interaction protocols were created. The effective transmission of the 3D model into a specialized analysis software package was confirmed. Also successfully tested was the conversion of models developed in other systems to a format supported by Solid Edge.

KONAR then developed a unified methodology across the design process. In this final stage of the software implementation, the company utilized a balanced approach to full roll-out, leveraging a high degree of software functionality while allowing for a "period of system familiarization." In this way, the enterprise quickly evolved to maximum production capacity. The company's new best practices and operating procedures were reflected in an enterprise standards guide, which includes specific instructions based on an individual's job responsibilities.



## Results after one year

The training was deemed highly effective. Two months after the system was deployed, KONAR specialists used Solid Edge to design its DN 700 PN 80 gate valve. "Valves for pipelines are characterized by non-standard geometric shapes, complex profiles and a large number of junctions," notes Pryamikov. "Solid Edge with synchronous technology helps accelerate our design process. Using Solid Edge, we soon realized just how quickly and effectively we could design valve parts from scratch, such as valve covers, which have highly complex surfaces."

Pryamikov was impressed with the software's capabilities for speeding up the change management process. He notes, "With Solid Edge, making changes is easy and fast. Importantly, use of the software considerably speeds up product development and project transfer to manufacturing."

Users have mastered the system and are putting its highly flexible CAD functionality to use across virtually every aspect of their jobs. Pryamikov explains, "Our specialists particularly value features that foster productivity, such as the assembly family/parts family capability, which enables users to quickly form an array of parts corresponding to given loads. Solid Edge is packed with features that boost productivity."

Using Solid Edge, KONAR has completed a comprehensive new library of fasteners. The fastener project was expedited as data developed with other systems was readily transferred for use via Solid Edge.

Designers emphasized the convenience of working with models imported from other CAD systems, made possible by Parasolid® software, the 3D solid modeling component used by Solid Edge and many of the world's leading independent software vendors (ISVs). Applications based on Parasolid, also from Siemens Digital Industries Software, enjoy seamless two-way data compatibility.

The company's challenge of building a model requiring a non-standard weld has also been resolved. PLM Ural consultants taught KONAR's designers to build the custom welds using the automatic mode. Now, while creating similar models, designers can evaluate how much material (electrodes) will be required to produce welded constructions.

It's been a highly productive year. Three new valve products, which differ in size and pressure specifications (to accommodate different environments) were developed using Solid Edge. Data developed on prior pipeline parts is also being re-used with Solid Edge.

With the most complete hybrid 2D/3D CAD system that uses synchronous technology, project data is now sent to production units electronically. 3D models are transmitted digitally to KONAR's partners, including the Italian enterprise Cividale Group, which is collaborating with KONAR on casting fixtures. Bodrov explains, "Integration with our European partners became to be a big plus for us. In Western countries, it is small and dynamic companies manufacturing components for the largest corporations that forms the foundation of the machinery industry."

Furthermore, KONAR's designers are now exchanging digital files with customers, including for the coordination and demonstration of technical solutions. Replacing the traditional paper-based mode, 3D data sharing has significantly increased the attractiveness of the company and elevated the importance of its experts to its customers. "With our experience in utilizing a fully digital development environment, we received practical confirmation of its effectiveness in product production and supplier/customer collaboration," says Bodrov.

Pryamikov points out what a difference just a year can make: "The use of Solid Edge, especially in terms of promoting our design speed and collaboration, is helping the company win significant new business."

## Next up: enterprise integration

KONAR plans to continue improving its processes and products using Siemens Digital Industries Software technology. For example, the company plans to launch operations in cooperation with Cividale Group for the manufacture of castings for pipeline fixtures. The casting equipment will be modeled using Solid Edge. Soon, Solid Edge will be integrated with the company's common, digitized information source, enabling data created using Solid Edge to be easily exchanged with its enterprise management systems.

Bodrov concludes, "We plan to keep enhancing our development/production environment, so that we can keep improving our responsiveness to the unique requirements of our customers and deliver ever more innovative, high-value design solutions."