

# Building on a solid foundation for Russian power projects

By the early 2000s, the economy in Russia had started to grow rapidly, resulting in a huge demand for electrical power. To meet this, the power industry had to dramatically increase production. UralTEP, a company which provides design, project management and engineering services to the Russian power industry, realised that, in order to achieve a considerable increase in production, they needed to move from their existing 2D design system to a 3D solution for planning, design and construction.

**Magnus Feldt**

Industry Marketing Manager, AVEVA

## A more sophisticated engineering system

Yury Bukhanov, General Director of UralTEP explains, 'We needed to work with 3D technology. Earlier, when using 2D technology, we often found that vital production information was missing. This often led to costly rework due to late design modifications. We needed a more sophisticated engineering system. After thoroughly evaluating several systems, we selected the AVEVA Plant solution and, in 2005, AVEVA PDMS was implemented. The installation, training and deployment of the software all went very smoothly.'

## Easy to import design information into AVEVA PDMS

The reconstruction in 2006 of the Strogino district heating power station outside Moscow was UralTEP's first project with PDMS. Installers, builders, technologists and electricians all worked with the system.

'One of the main reasons for selecting PDMS,' continues Yury Bukhanov, 'was that we found it very easy to import design information into PDMS from other systems. Siemens provided 3D models of turbines for the Strogino project and we easily imported these models into the PDMS model of the plant.'

'Today, we use PDMS right from the start of a project, when the first layout of the plant is created, then for all aspects of layout and detailed design, including piping, ducting, equipment, electrical, instrumentation and structural disciplines.'

'All kinds of fabrication and construction drawings, such as piping isometrics and arrangement drawings, together with Material Take Offs for all disciplines, are generated directly from the PDMS model.' Other notable PDMS projects performed by UralTEP included the reconstruction of the Ufinskaya thermoelectric power plant, Novgorodskaya fossil power station and Pervomayskaya combined heat and power plant, and the construction of the Noyabrskaya combined cycle power plant.

The Noyabrskaya plant was the first major project executed by UralTEP using PDMS. Work was carried out on both the integrated design of the main building and the water treatment facilities. This project also gave UralTEP the opportunity to test their communications with third-party organisations, in this case GE, who provided detailed 3D models of the turbines. These models were then used to assist in the design of the pipelines.

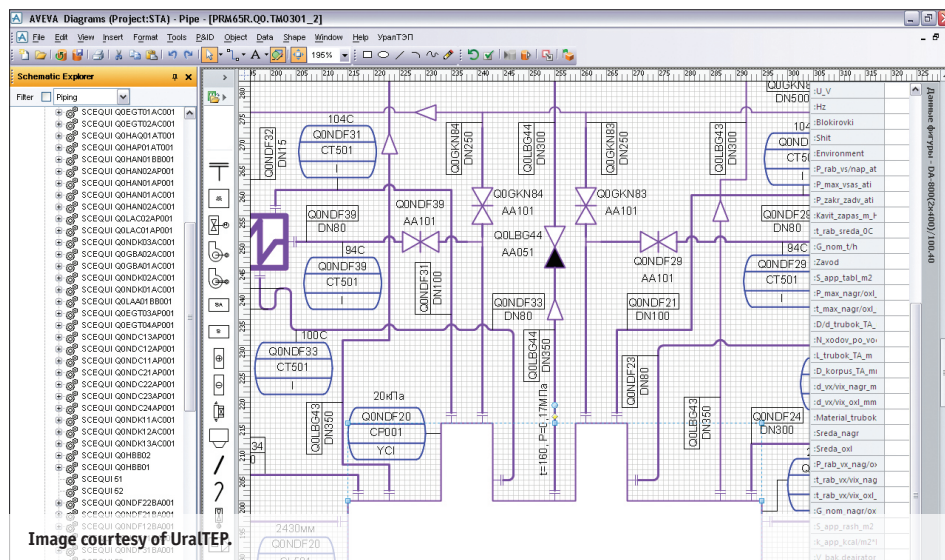


Image courtesy of UralTEP.

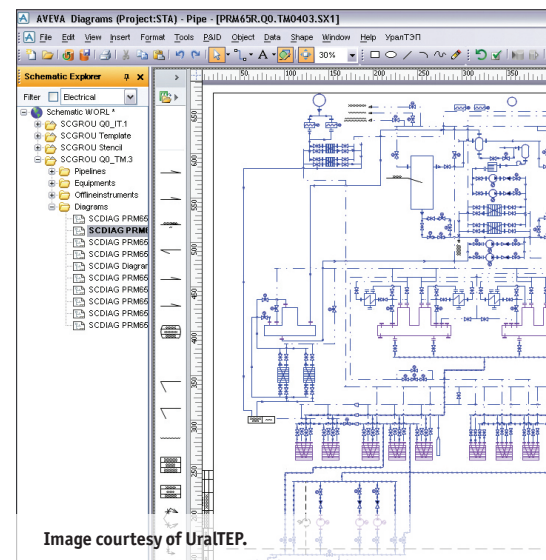


Image courtesy of UralTEP.

The Pervomayskaya project involved 45 UralTEP specialists. Work was started in 2007 and the station was put into operation in 2010. PDMS was implemented on the project and used for the construction of the 3D model and checking for conflicts, as well as for the production of working documents using the PDMS Draft and Isodraft modules.

Yury Bukhanov explained, 'UralTEP migrated to AVEVA PDMS 12 in late 2009, to gain access to the new functionalities and to allow us to use new products such as AVEVA Diagrams, AVEVA Schematic 3D Integrator and AVEVA Cable Design.

'By using PDMS, we have considerably shortened design times, and improved the quality of our design and construction information. PDMS's ability to generate clash-free designs is very important. This saves both time and money by avoiding costly modifications at the construction site. We have further increased efficiency in the design process, enabling concurrent working between different design disciplines, with the ability to manage large quantities of data.'

#### **AVEVA NET improves communication with the client**

For the Pervomayskaya combined heat and power plant project, UralTEP wanted to improve their communication with the client and the construction contractors. So, in 2007, they implemented AVEVA NET.

'During the design process,' Yury Bukhanov told us, 'we regularly updated the plant model in AVEVA NET. Our client and the construction contractors could then monitor the actual status of the project via the Internet so that they could understand how the design was progressing. We also used AVEVA NET during video conferences so that everyone, in every location, could see and understand the latest design and construction information.'

All production information derived from PDMS was delivered to the construction companies via AVEVA NET. This simplified communication between UralTEP, the client and the construction companies, and resulted in significant improvements in both quality and efficiency, leading to genuine savings in both time and money during construction. AVEVA NET is also being used in the Noyabrassku project, where the 3D model is published together with references to the drawings and documents. The functional portal integrates all the technical information and provides access to all users, which accelerates the adoption of technical solutions.

#### **AVEVA Diagrams – quick and easy to use**

AVEVA Diagrams was implemented in 2009 for the combined auxiliary building of the Pervomaiskaya thermal plant in St. Petersburg. Using this new software, UralTEP quickly completed the technology segment of the project. Heating, ventilation and air conditioning, together with water supply and sewerage parts were completed, as well as P&IDs and diagrams of the cable lines.

'Our users found the product very quick and easy to use,' Yury Bukhanov continues, 'and they especially liked the Visio-based diagramming user interface. AVEVA Diagrams is built on the same technology platform as PDMS, which brings many advantages. All of the system administration, customisation and configuration functionality was already familiar to all our administrators. We were able to deploy the product very quickly with almost no additional administrative overhead.

The implementation of AVEVA Diagrams was closely followed by the introduction of AVEVA Schematic 3D Integrator, which also allowed UralTEP to achieve significant gains in time, cost and quality. Using the Integrator they are able to check consistency of design between the P&ID and the 3D model, and even between the ductwork schematics and the PDMS 3D model.

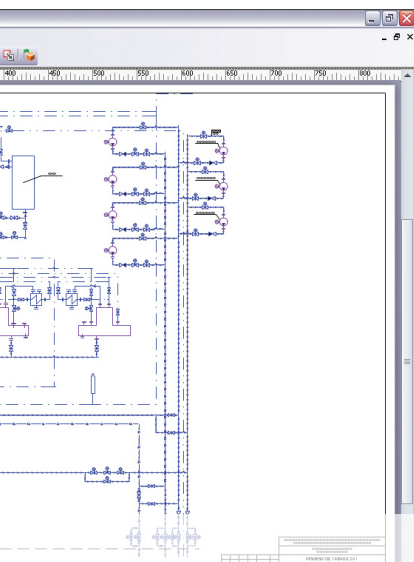
'The successful use of AVEVA Diagrams and Schematic 3D Integrator undoubtedly resulted in reduced rework in design and construction,' concludes Yury Bukhanov. 'Another important result was that the process and detailed design departments are now able to work together in a much more integrated way.'

#### **About UralTEP**

UralTEP was founded in 2003. Since 2008, the company has been owned by OAO Energostroyinvest Holding, one of the leading companies in the Russian energy sector. With its head office in Ekaterinburg, UralTEP currently has more than 350 employees.



Over the past seven years, UralTEP has completed many thermal power engineering projects as general designer, and many other plant modernisation and reconstruction projects. Visit [www.uraltep.ru](http://www.uraltep.ru) for more information.



Yury Bukhanov, General Director of UralTEP.

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