TPG
THE PROJECT GROUP

CASE STUDY

Končar Power Transformers Ltd. (KPT)

How the joint venture of Siemens Energy and Končar benefits from Microsoft PPM for production planning and manufacturing

Working with TPG, Končar Power Transformers Ltd. – a joint venture of Siemens Energy and Končar – came up with a novel way to streamline its small-series production line for complex products that are customized for practically every customer. At first glance, advanced project and portfolio management is an unconventional solution to production planning challenges in a factory – but turns out to be exactly what was required at KPT.

KPT's production plans are now automatically coordinated across all departments and rolled up into a master plan, ensuring everyone is using the same information.

Industry	Energy
Department	Production Planning
Components	Microsoft Project Server
	TPG PSLink
	TPG ProjectLink

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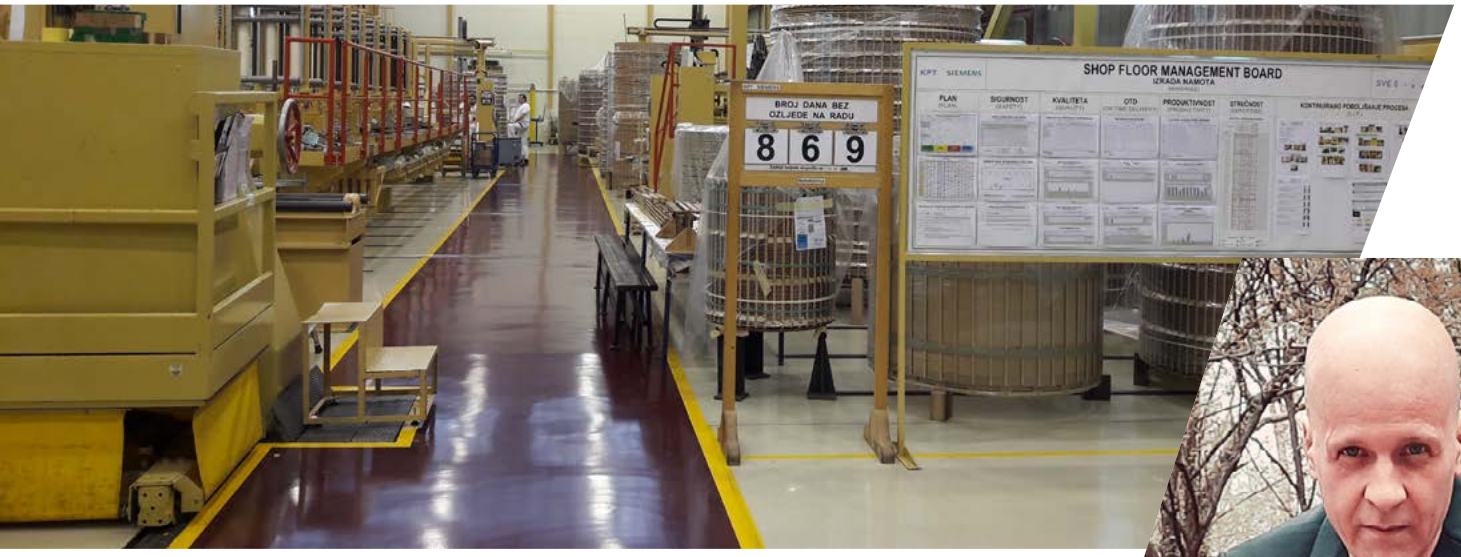

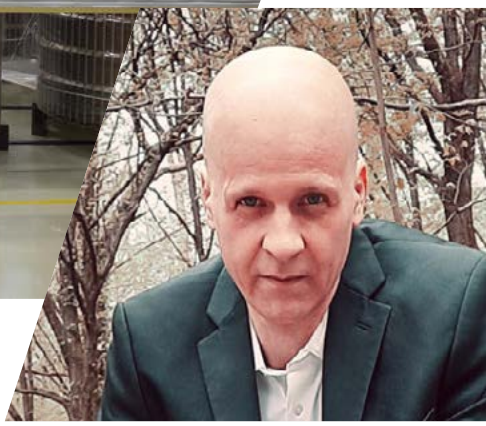

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Domagoj Salaj, Production planning team leader at KPT

THE COMPANY

Končar Power Transformers Ltd. (KPT), a joint venture of Siemens Energy and Končar based in Zagreb, Croatia, specializes in the design, development, production, sale, testing and servicing of power transformers. It has been producing transformers since 1945. KPT makes its products in very small series – sometimes just one unit per customer and seldom more than three. Although the basic construction of a transformer follows the same pattern, there are often many differences depending on how the customer plans to use it.

WHAT IS A TRANSFORMER?

Put relatively simply, a transformer is a large piece of equipment used to transfer electrical power from one circuit to another. It consists of an iron or steel core made of many sheets of metal stacked on top of each other (this helps avoid wasting energy, which would be a risk with solid iron cores). Each core has two or more sets of coils wound around it, called windings. These are usually made of high-conductivity copper and insulated with special paper or other materials. When voltage is applied to the first winding, it builds up a magnetic field between in the iron core. Magnetic field in the core induces electric current due to electromotive force in the other winding. Depending on the ratio between the primary and secondary coil windings, current can be increased or decreased depending on the application's needs.

KPT transformers – often the size of a truck – are often used in challenging environments, such as to generate power in a desert or a rainforest as well as in heavy manufacturing and other scenarios.

THE CHALLENGE: FINDING A PARTNER WITH THE RIGHT SKILL LEVEL

KPT had already been looking for ways to optimize its production planning in 2010. As it is a joint venture between Siemens Energy and Končar, the Siemens Energy partner in Nuremberg was tasked with trying to find a universal solution that would meet the planning requirements of all the transformer factories making prototypes and small series. Unfortunately, this initially proved to be impossible.

Siemens Energy then set about contacting four service providers to see if any of them could help. The initial solutions from two of the providers were designed for serial production rather than small series or one-off products, so they were rapidly discounted as not being relevant to KPT's business model. The remaining two solutions – developed for the Siemens Energy factories in Austria and Italy – had been customized to meet the specific needs of those facilities and were not suitable for implementation in the KPT environment.

THE IDEA – BASED ON AN EXISTING MICROSOFT PROJECT ENVIRONMENT

Domagoj Salaj, production planning team leader at KPT, is an expert in the integration of planning systems and KPT business processes. Using Microsoft Project, he had already devised a way to streamline and partially automate the planning process. However, he was looking to supplement his solution with additional functionality in order to make it accessible to many more users. As Salaj had in-depth knowledge of each step in the planning process and the issues that can arise, he also believed that a broader-based solution, built on top of his own creation, could be of interest to other subsidiaries in Siemens Energy.

TPG STOOD OUT OF THE CROWD

„At KPT, we started looking for outside firms to help us. We received a couple of names from Siemens Energy and added a few of our own findings, then carried out extensive research on all of the companies ourselves," he explains. „The one that stood out was TPG. Their approach impressed me, and they also offer their own add-in tools that extend the functionality of Microsoft Project," adds Salaj. Around 18 months ago, Salaj contacted TPG to see how its specialists would approach the problem. „We knew exactly what we wanted and didn't want to make any compromises, so TPG was the only logical choice," comments Salaj.

The KPT and TPG teams started work on the project following a test and evaluation phase. This was right in the middle of the coronavirus pandemic, so business travel was impossible and all of the collaboration on the project was conducted via Microsoft Teams. As the project progressed, the collaboration was exemplary despite the difficult circumstances. „TPG was always available to answer any questions, while my colleagues and I helped resolve challenges on our end," says Salaj.

SIMPS IS BORN: DATA SHARING BETWEEN TASKS IN THE PLANNING PROCESS

The result of the project is the Smart Integrated Multi-level Planning Solution (SIMPS). It is based on Microsoft Project Server 2019 along with the product TPG Project-Link and the customized features in the Transformer System Selector (TSS) add-in and web app. TPG ProjectLink is a Microsoft Project Client add-in that is available both on-premise and online. It starts by creating soft links between tasks, enabling the user to change start and finish dates and work between linked tasks without affecting the real schedule. Next, TPG ProjectLink provides enhanced and configurable data sharing between tasks. Users can choose to have this shared information updated automatically across all tasks – and this feature is exactly what KPT required for its planning processes.

IDENTIFYING DEVIATIONS TO REALIGN THE SCHEDULE INTO ONE MASTER PLAN

SIMPS provides an overall master plan covering every phase and segment of KPT's transformer production process. The master plan is based on a universal template. The most important segments include the design phase as well as the assembly and winding processes, which have dedicated segment plans within the overall master to accomplish their operative work. While this work is running, changes may occur and generate a deviation to the overall master. As a result, KPT required continuous data sharing between the dedicated segment plans and the overall master to identify deviations and take measures to realign the schedules. This data sharing function is carried out by TPG Project Link.

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Domagoj Salaj

DATA SHARING BETWEEN MASTER AND SUB-PROJECTS, PORTFOLIO AND SUB-PORTFOLIOS

The overall master and the associated segment plans encompass the delivery of one order, which is often for a single transformer but sometimes a small series. However, KPT has many orders that need to be planned for the design department, the production facilities, purchasing and other departments. This is why the overall plans and the segment plans are integrated into what KPT calls the consolidated master. In technical terms: subprojects are uploaded into a master project and the portfolio of all plans is divided into sub-portfolios. KPT works with a consolidated master for short term, mid-term and longer-term planning aimed at different user groups. The TSS add-in is the tool that provides the interface with the necessary information, enabling users to select the right overall master and segment plans within the right consolidated master plan. To give an example of how this works, the planning manager for the design department can use the TSS add-in to see which orders and transformers are planned for design in the next six months. The planner can select these projects by highlighting them and uploading them simultaneously into a consolidated master.

FINDING INFORMATION QUICKLY AND EASILY

The Transformer System Selector (TSS) web app provides a graphical overview of the whole order portfolio (the consolidated overall master plan) and for the segments (the consolidated segment plans). The TSS web app is the platform that planning managers use to provide the required information to the department staff. It provides configured charts for the company's management as well as for department managers and staff, especially the design, winding and assembly segment departments.

„The idea behind the system is accessibility," says Domagoj Salaj. "It enables the end user to find information quickly and easily. Data can only become information when it is accurate and available at the right time to the person or people who need it."

At its core, SIMPS is a centralized, database-driven and high-performance system for all users and roles. „SIMPS prevents the unnecessary duplication of work and minimizes data inconsistency, while increasing efficiencies in our core processes," adds Salaj.

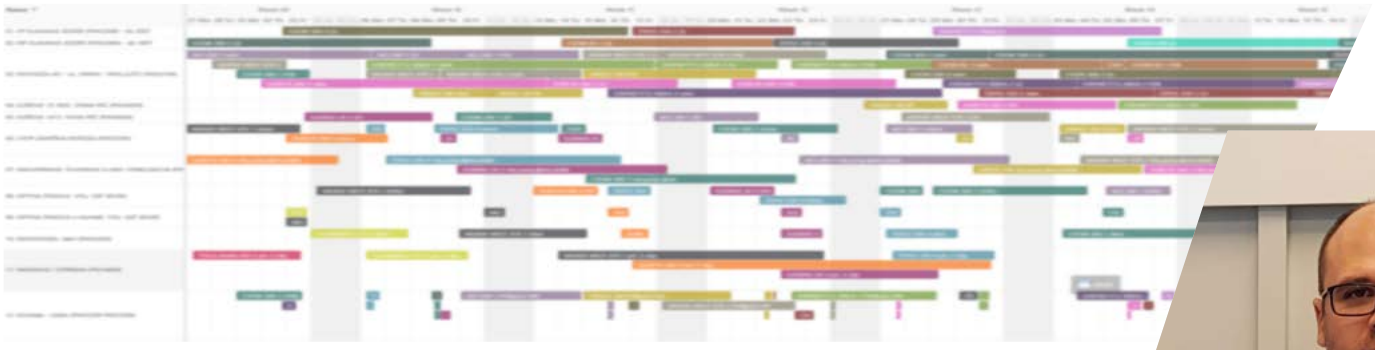
TRANSPARENT OVERVIEW AND WHAT-IF ANALYSES

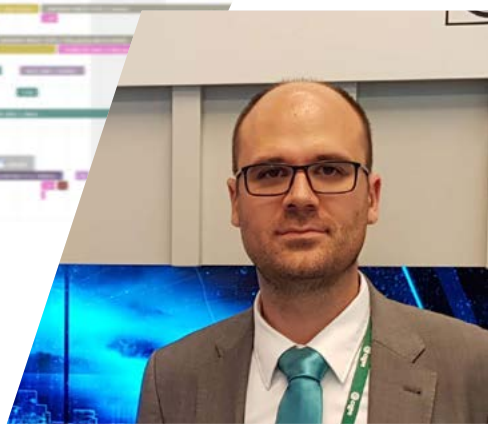
Salaj comments: „We now have a complete overview, which we call the consolidated master plan, and can drill down into the details of each project. We can even do what-if analyses. If something in one project is changed, we can see how the modification will affect each of the other projects and the master plan as a whole." For example, his team can now see how long transformer X has been in production, what stage transformer Y is at, when transformer Z is due to move from the design phase into production, and more. Staff can also conduct tailored searches, such as finding out which production steps are due to complete in the next X weeks.

EARLY WARNING OF BOTTLENECKS IN THE PROCESS

In addition, TPG developed further functions for KPT that are not available in the standard Microsoft Project solution. Completed by a detailed yet clear and easy-to-use interface, the result is the TSS. It is available both as a web app and as a client. „The TSS add-in gives us an enormous amount of insight we didn't have before," says Salaj. „We can see exactly what stage we're at with the core stacking operation and whether there's a threat of bottlenecks anywhere in the process." TSS enables his team to standardize the planning process and provides a wealth of information, such as deadlines, manufacturing schedules for months or even years ahead, and which resources will be available or unavailable during those times.

About 15 people use the solution currently, of whom four are planners and use it more intensively. As it matures, Salaj plans to make it more widely accessible across departments. User feedback and acceptance has been very positive.





„The TPG solution makes our planning process much more efficient.“

Žarko Janić, Head of Operational Excellence at KPT

MORE CONTROL OVER, AND VISIBILITY INTO, THE RANGE OF PROJECTS AND PORTFOLIOS

„The TPG solution makes our planning process much more efficient,“ notes Žarko Janić, Head of Operational Excellence at KPT. „As we make each transformer to order, each product is different. That's why we wanted to achieve variant planning that included what-if possibilities. For example, we needed to know how the overall plan would be affected if we received X new orders and that is easy to do now. We have produced a strategic plan for management looking several years ahead, a tactical plan for the mid-term, and a scheduling plan for the shop floor. As a result, we have much more control over – and visibility into – our range of projects and portfolios now.“ Janić adds that the three must-have requirements they had identified – multi-variant and multi-user planning capability; an interconnected Gantt chart of the consolidated master plan with the ability to drill down into individual production steps; and custom views for various types of internal user – have all been achieved.

PRODUCTION PLAN IS ALWAYS ACCURATE ACROSS ALL DEPARTMENTS

„We now have the confidence that our production planning is always accurate,“ adds Janić. “If one due date is changed all the others are too, and the stock inventory is also connected to the plan. The bottleneck situation has improved dramatically since we've been using this solution.“ They now no longer have to send out weekly PDFs with this information, which was already out of date after a couple of days.

For the planning team leader Domagoj Salaj, working with TPG has made the multi-user capability of Microsoft Project easier to use and manage. „People from different departments can work with it now – and that was too complicated before,“ he notes. „The reporting solution is web-based, enabling users with the relevant permissions to drill down into individual plans without losing sight of the overall, consolidated plan.“

He adds that KPT had been using Microsoft Project since 2003 but is now able to benefit from it on a higher and more professional level.

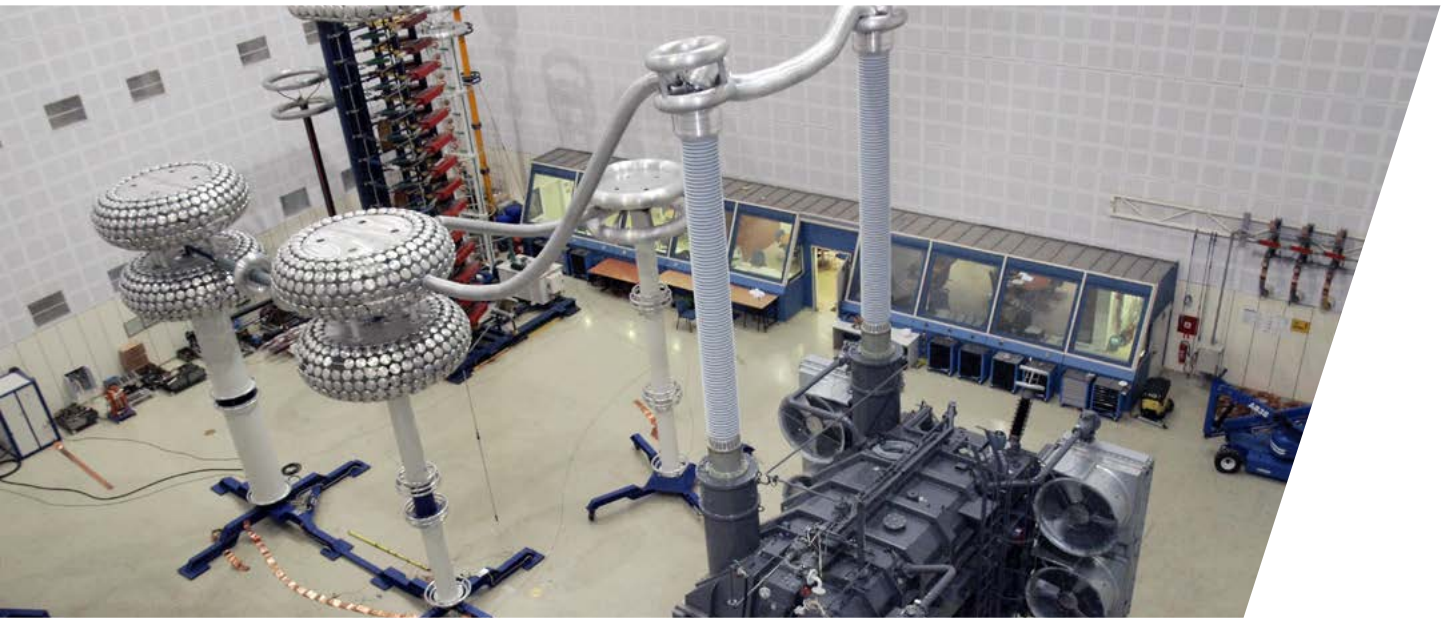
FUTURE PERSPECTIVES: SAP INTEGRATION

Janić says that TPG is currently implementing its TPG PSLink solution to enable bidirectional data sharing between SAP and Microsoft Project Server. „We're busy with transitioning our systems from legacy to SAP S/4HANA at the moment, so we'll interconnect our ERP with MSP and the TPG solution as soon as we can,“ he notes.

KPT is also working with TPG on expanding the current permissions system in order to enable more users to benefit from the solution, but only on a need-to-know basis.

As for Domagoj Salaj, working with the new solution is inspiring him to think big. „We're still at the early stages – the TPG solution has only been operational for a few months – but it's progressing fast and the more I work with it, the more ideas I have about ways to improve it even further and add new functions!“ And the specialists from TPG will certainly be on standby to help make these ideas a reality and boost the efficiency of KPT's production planning even further. There may also be the potential for KPT to present its SIMPS solution to other Siemens Energy factories struggling with production planning issues and help them implement it.

For KPT, there are clear benefits to the use of professional project and portfolio management for production planning in its manufacturing environment – even if this is an unusual example of how PPM is used. Complex challenges sometimes require unconventional solutions – and this may well be a useful tip for other manufacturing companies with similar issues.



SHORT PROFILE

THE COMPANY

Končar Power Transformers Ltd. (KPT), based in Zagreb, Croatia, specializes in the design, development, production, sale, testing and servicing of power transformers. KPT is a joint venture of Siemens Energy and Končar. The company has been producing transformers since 1945. Today, its products span step-up transformers up to 550 kV/1000 MVA; network and auto transformers up to 550kV/1000 MVA; HVDC transformers up to 550 kV DC; and shunt reactors up to 550 kV/250 MVAr.

THE CHALLENGE

KPT wanted to streamline and optimize its production planning processes while ensuring that all its departments were working from the same information base. It had been collecting plan information from them, then sending out a PDF which was out of date almost immediately. KPT had developed an in-house solution that went some way to solving the problem, but had difficulties finding a service provider that understood the issues and had the right skill sets to solve them.

THE SOLUTION

The result of the project is the Smart Integrated Multi-level Planning Solution (SIMPS). It is based on Microsoft Project Server 2019 along with the product TPG ProjectLink. TPG ProjectLink is a Microsoft Project Client add-in that is available both on-premise and online. TPG also developed some customized features for KPT and implemented them in an add-in and web app known as the Transformer System Selector (TSS).

THE BENEFITS

Continuous data sharing between all stages of the planning process give all departments a unified and easy-to-use overview of the information they need. In addition, the TPG solution provides users with far more extensive insight than they had before, supporting faster decision-making and more efficient planning. They also have early warnings of potential production bottlenecks. Users from management to the shop floor also benefit from better visibility and more accurate control over their projects and portfolios.

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