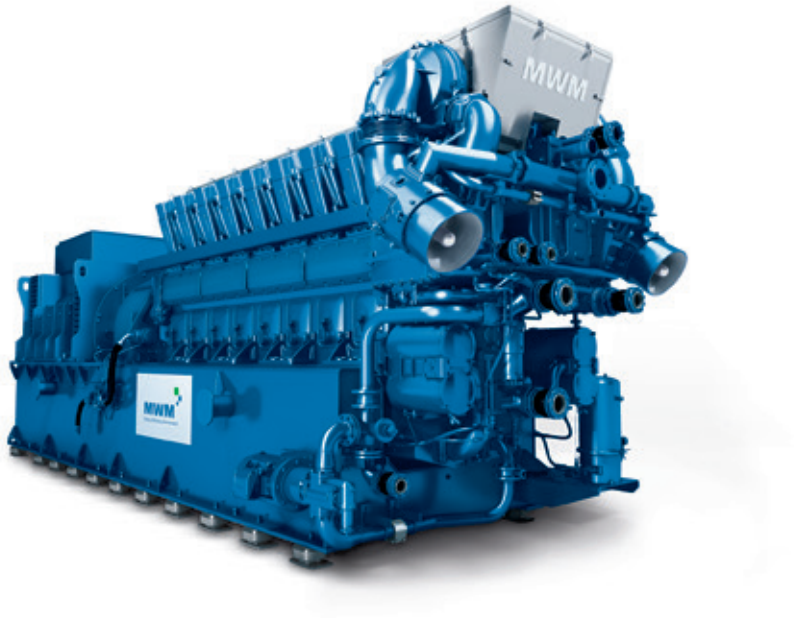

MWM
Energy. Efficiency. Environment.
A Caterpillar Company

SUCCESS STORY

CATERPILLAR ENERGY SOLUTIONS: EVOLUTION IN ELECTRICAL ENGINEERING

WS CAD
ELECTRICAL ENGINEERING

At a Glance:

Customer
- Caterpillar Energy Solutions, Mannheim, Germany
- Manufacturer of gas engines, electricity power plants, as well as CHP plants.

Situation
- Diverse customer requirements having to offer customized solutions
- Sales department work with a configurator
- Time constraints in the electrical design lead to outsourcing of design tasks

Solution
- Coupling of the configurator with
- the electrical CAD software

Used software
- WSCAD SUITE
  - Electrical Engineering
  - Cabinet Engineering Expert
  - Automation Interface (Add-On)

Benefits
- Automatic and error-free creation of electrotechnical documents triggered by the configuration done by sales
- Free resources in the electrical construction
- Tasks do not have to be outsourced anymore
- Extra time to work on new projects resulting in increased business revenue

German Mechanical and Plant Engineering has been successfully automating production and processes for decades and has thus established itself as a global leader. Under the concept Industry 4.0, also known as the Internet of Things (IoT), the industrial sector is now heralding the next phase in manufacturing with self-controlling production. But what exactly is happening in the engineering and design departments, especially in the area of electrical engineering and design? The Mannheimer Caterpillar Energy Solutions GmbH took a revolutionary step forward and is now generating standardized electrical engineering plans, including documentation, directly with their existing in-house product configurator at the touch of a button. Error-free, in the shortest possible time, and with hardly any interaction required from a designer

As part of the Caterpillar Electric Power Division with 64 locations in 20 countries, the Caterpillar Energy Solutions stands for highly-efficient and eco-friendly solutions for distributed power generation, and manufactures gas engines, electricity power plants, as well as CHP plants. Its global customers include, for example, operators of greenhouses, sports facilities, arenas, hospitals and airports as well as production facilities. Optimized for natural gas, biogas and other special gases, such as and cogeneration power plants in the power classes from 400 kW to 4500 kW which are deployed wherever there is no power supply available or where operators want to be self-sufficient. Their modular design enables them to be loaded and shipped in containers to their destination, where they are assembled and put into operation.

The standardization and modularization of the product range is intended to allow customized solutions to be offered for the most diverse requirements quickly and inexpensively. A product configurator created especially for Caterpillar supports and enables the sales team to create complete and customized plants and offers with optimized equipment for specific needs within a very short time frame. However, due to the many aggregates and combinations involved, the electrical design process is not simplified and as a result, but becomes even more cumbersome and complex. While Sales can act and respond quickly by using the configurator, the pressure on the technical departments actually increases. Having more than 20 possible languages for the plans and documentation and the well-known shortage of skills across the board does not al-

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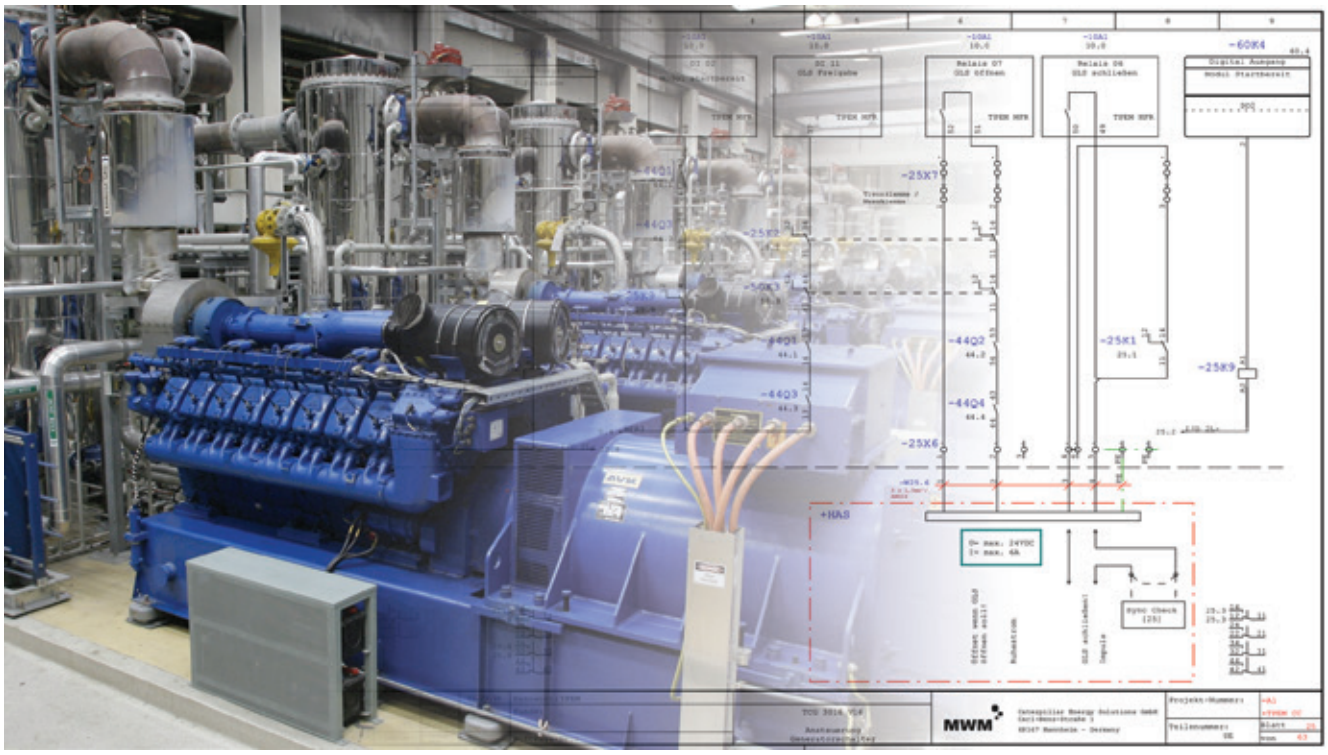
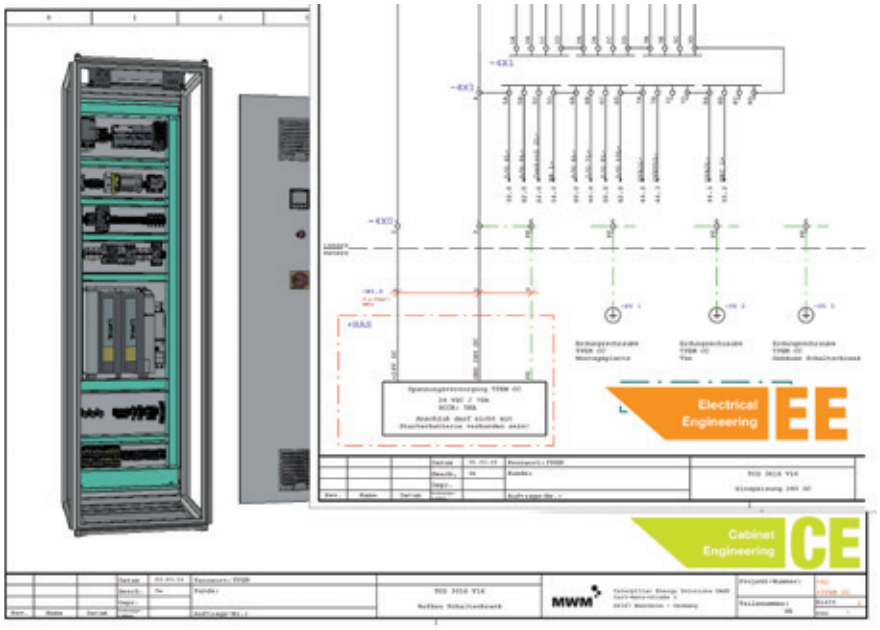


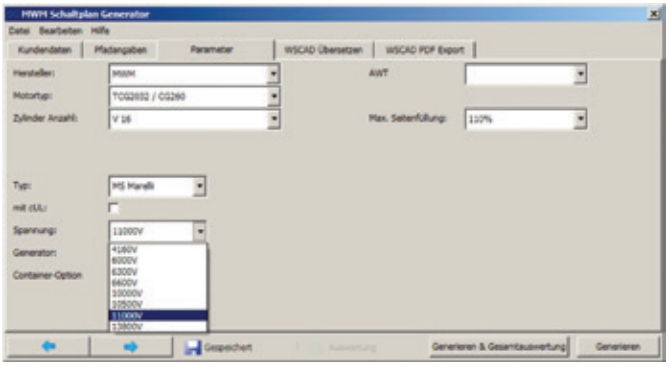
Seven MWM gas gensets from Caterpillar Energy Solutions provide power for the water supply of the 3.7 million metropolis Melbourne. The electrical engineering planning and documentation for the machines and systems are done with the electrical CAD solution from WSCAD.

leviate the situation. The efforts by Caterpillar to automate the development and construction process go back a long way. In the first step, the use of macros and macro variants reduced the lead time for an average project with several hundred pages from several weeks to about one week. In addition to the electrical CAD solution from WSCAD, the Project Wizard add-on also allows the automatic creation of plans, the processing time was reduced further to about one day. But even these six to eight hours could not resolve the bottleneck in the long run: new series and products needed to be developed, and the responses to changing customer requirements had to be significantly faster. Another issue that the designers faced was the fact that they had to collect and record many of the details from the sales and project management processes as well as already existing data in the organization for electrical engineering. "Our objective was simple and clear: we were looking for a solution with which we could create the overall electrical planning and documentation without manual intervention and with minimal effort", said Andreas Dworzsak, electrical engineer and developer at Caterpillar Energy Solutions, when describing the initial situation.

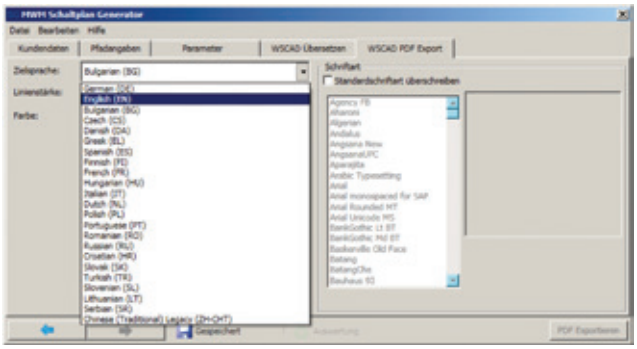
As a possible solution, the favored idea was to get the electrical CAD



Circuit diagrams, control cabinet assemblies and much more: The complete electrical engineering planning and documentation of the cogeneration power plants occurs with the respective disciplines from the WSCAD software.



Configuring instead of designing: All electrical plans, including the documentation of several hundred pages for an individually configured CHP are created in the background in the WSCAD software directly from within the product configurator at the push of a button within seconds.



In addition to the technical parameters, even the target language of the documentation is set in the configurator and sent to the WSCAD software to generate the electrical engineering documentation at the touch of a button.

software to prepare all plans and documentation fully directly from within the product configurator. With this requirement in hand, Caterpillar initially turned to a well-known vendor on the market. Their solution was short and sweet: to replace the customized configurator that was individually created for Caterpillar by their own proprietary product. But this would have meant the entire transfer of know-how from the currently used tool to the new product in addition to the purchase of a new configurator. Too time-consuming and too expensive. Especially since a transition from the WSCAD software to the electrical CAD solution of the new provider, including all documents, would have been mandatory. In the second attempt, Caterpillar Energy Solutions therefore approached WSCAD and were welcomed with open ears. The Management and Development at WSCAD recognized the need immediately and agreed to create, in close cooperation with Caterpillar, an interface to which the currently used product configurator can dock and initiate the fully automatic preparation of plans and documentation through the WSCAD software. The result, a year later, is now a new addon product called the Automation Interface. This upstream interface to the WSCAD software is the connection to any product configuration system on the market. Whether the configurator is in the ERP or PDM system or a special software program such as that from Acatec, or the custom development of Caterpillar, is totally irrelevant. At the touch of a button, the configured

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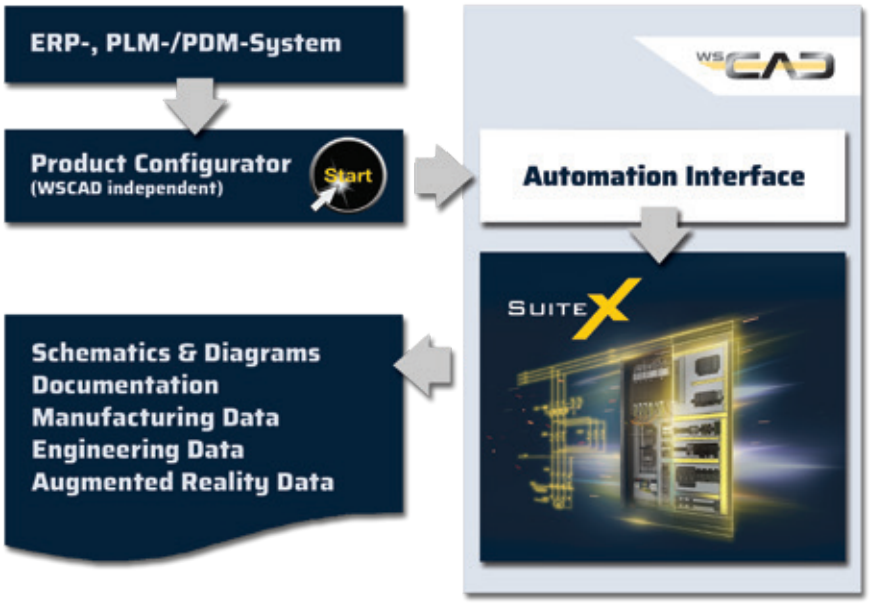

In addition to the technical parameters, even the target language of the documentation is set in the configurator and sent to the WSCAD software to generate the electrical engineering documentation at the touch of a button.

The Automation Interface at a glance

- Interface between a product configurator and WSCAD software
- Freely selectable product configurator such as SAP, Teamcenter, Acatec or proprietary developments
- Information from the configurator is converted into a command language valid for the WSCAD software
- Complete plans, including documentation, are created for standardized scopes in virtually no time at all and at the touch of a button
- The entire process runs as a background process in "silent mode"
- No interaction required by the user
- Plan preparation overnight
- Special support services available from WSCAD for the introduction and implementation

product with all the relevant data for the electrical engineering process is passed to the WSCAD software and converted into a valid command language for the WSCAD software. As if by magic, the complete documentation is created effortlessly. It is possible to do exactly what can be done manually with WSCAD. The entire process runs as a background process in "silent mode". The WSCAD software does not need to be started, and even the users themselves need not be present during the creation of the plans. Configuring rather than programming – or software controlling software – a step toward Industry 4.0 or the Internet of Things in engineering. If time is scarce, the requisite knowledge for connecting any configurator to the Automation Interface can be procured from WSCAD as a service.

Following the successful completion of the test phase, the new type of electrical design at Caterpillar Energy Solutions is now being introduced in the production phase. Plans, including documentation, are created in the set languages at the touch of a button. The generated PDFs and lists are placed in the predefined directories. "We can now plan without having to be familiar with WSCAD" says Andreas Dworzsak. "Just push the button, and WSCAD generates the complete documentation for any configuration in the desired language. So we now have more resources free for design and do not have to outsource design tasks to the previous extent. In addition, we can focus more on special solutions for upcoming projects that are not standard and require a major design effort. This enables us to win new orders."

WSCAD is part of the Buhl group with more than 800 employees. WSCAD has been developing electrical CAD solutions for three decades. Customers include medium-sized companies, international corporations and engineering service providers. More than 35,000 users rely on WSCAD software as their electrical CAD solution. The software is based on one core platform that covers six engineering disciplines: Electrical Engineering, Cabinet Engineering, Piping and Instrumentation, Fluid Engineering, Building Automation and Electrical Installation. Any change made to a component in one discipline immediately reflects in all the other disciplines. WSCAD methodologies for standardization, reuse and automation significantly reduce engineering time from several weeks to just a few hours or even minutes. At the same time, these practices also ensure a much higher quality of work.

wscaduniverse.com is by far the largest electrical CAD data library on the market offering over 1.4 million parts from more than 380 manufacturers. It is the only digital library that supports both WSCAD and Eplan* users alike as well as 3D CAD data. Use and provision is free of charge for all users and manufacturers of components and equipment. Maintenance engineers and service personnel are now able to scan devices and components within a control cabinet by using the WSCAD Cabinet AR App on their smartphones or tablets. This provides them instant access to the schematics, device tags, part data, 3D views and even the original data sheets from the manufacturers.

The WSCAD portfolio is completed by eleven seamlessly integrated service offerings from WSCAD Global Business Services such as: engineering and migration checkups, consulting and training, digitization of paper documents and conversion of third-party electrical CAD formats.

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