Issue 03|2017

IMPULSE

16TH TECHNICAL CONFERENCE

All about energy efficiency

8–11

INVESTMENTS AT THE VEM LOCATIONS

6/15

SPS IPC DRIVES 2017

See you in Nürnberg
from 28th to 30th November

2–3

SPS IPC DRIVES 2017

NEW VEM FAIR STAND **WITH INNOVATIVE EXHIBITS**

The international exhibition for electric automation systems and components in Nürnberg is the most important date in this year's trade fair calendar for VEM. Customers, partners and all other representatives of the branch will have ample opportunity to experience the attached importance for themselves. This will also be VEM's first public appearance in a modified corporate design. Three innovations from our diverse portfolio of variable-speed drives and drive system will be on show for visitors to SPS IPC DRIVES 2017.

Size 450

With motors in size 450, VEM has extended its low- and high-voltage product range for outputs up to 1 MW and thereby underlined its reputation as an all-round system supplier. The size 450 motors implement a new style of housing and a revised cooling concept with an internal cooling circuit and redesigned housing fins. True to its modular approach, VEM has here built upon the existing size 400 design. The trade fair exhibit demonstrates the possibilities for variable placement of the terminal box for both low- and high-voltage versions.

IE5 motors

VEM has similarly broadened its portfolio with regard to permanent-magnet synchronous motors and now embraces also the highest energy efficiency class IE5 as defined by the latest branch standards. These motors are designed for converter-fed operation and thus achieve higher efficiency ratings. One characteristic benefit of IE5 motors in conjunction with pumps, for example, is enhanced efficiency in the partial load range. The highest system efficiency rating offered by VEM for a combination of motor and converter is IES 2.

Motor monitoring

A simple-to-install system can be mounted on the terminal box to enable the permanent recording of actual load and operating states. Our trade fair exhibit presents an example of how the recorded data can be evaluated and used. The possibilities include energy consumption analyses conformant with the requirements of ISO 50001 and data acquisition to enable preventive maintenance. In the context of Industry 4.0, motor monitoring supports the communication between machine, operator and manufacturer over the whole lifecycle of an installation.

Visit VEM at SPS IPC DRIVES

from 28th to 30th November 2017 in Nürnberg, **Hall 3, Stand 268**.

POWER TO HYDRO ENERGY

Three generators from VEM contribute to modernisation of a hydropower plant in South Tyrol.

A hydropower plant built on the River Talfer near Bozen in the 1950s is currently being modernised by its new operator Eisackwerk GmbH. With an annual capacity of 270 GWh, St. Anton is at present the fifth-largest hydropower plant in South Tyrol.
In 2018, VEM will be supplying three hydropower generators with a rated output of 39 000 kVA each and a rated speed of 600 rpm. Due to their size, the generators must be delivered in parts and then assembled on site by VEM customer service engineers. This represents a major challenge, as space in the cavern is very limited.

With this hydropower project, VEM is once more demonstrating its decades of experience in the field of power generation and can add a modern reference installation to its list of hydropower achievements.

Computer model of the synchronous hydropower generator (39 000 kVA, 13.8 kV, 600 rpm)

NORWAY STANDS BY ELECTRIC DRIVES

New vessels with purely electric propulsion for two important ferry routes – with motors from VEM

When the first vessels for two important Norwegian ferry routes take to the coastal waters from 2018, they will feature a newly developed rudder propeller from SCHOTTEL with electric motors from VEM. The new drive rounds of the portfolio of propulsion specialist SCHOTTEL, whose Combi Drives have already incorporated electric motors from VEM's Dresden location for a number of years.
A compact electric motor with high power density is integrated vertically into the support tube of the EcoPeller® – the name given to the new SCHOTTEL thruster system. The eight space-saving motors to be supplied by VEM are each designed for an output of 1 050 kW at 675 V and a rated speed of 790 rpm. They guarantee an efficiency of 96.9%. The special thing about the new vessels: The main propulsion drive is purely electrical, and the batteries can be recharged at each destination port.

"I ENJOY ASSUMING RESPONSIBILITY"

Kevin Lein is the new head of quality assurance at VEM motors Thurm GmbH.

It may sound a rather sober topic to many, but it is the chosen focus of daily work for Kevin Lein: Quality management. Kevin Lein took up the duties of quality manager in August 2017, enabling his predecessor to prepare for a well-earned retirement next year. To be more precise, he actually applied for the job. "In the eight years that I already worked for our company as a production engineer in operational planning and technology, I realised that I enjoyed assuming responsibility," he explains.

Further concentration on customer satisfaction, optimum planning of company processes and contributions to the prerequisites for optimised production – those are permanent tasks for any head of quality assurance. For Kevin Lein, there is currently one more special challenge.

"Standardisation would enable us to make better use of the common aspects in our organisational and production processes."

He is working on an "integrated management system", which is intended to bring the three VEM locations even closer together. "Greater standardisation in the business processes implemented in Zwickau, Wernigerode and Dresden would enable us to make better use of the common aspects in those organisational and production processes in the future, and that would in the end benefit the customer," he says.

"Even though there will naturally be certain location-specific facets, a common management system represents a foundation for long-term business success."

"A common management system represents a foundation for long-term business success."

The way he says that already reveals that his new duties are by no means a sober topic as far as Kevin Lein is concerned. There is passion in his voice. And that – everyone will agree – is an ideal starting point for the success of a project.

Kevin Lein (33) has worked as head of quality assurance at VEM motors Thurm GmbH since August 2017. He is married and has one son. Once he completes the move back to his home town of Schneeberg, he will also have more time to devote to his favourite hobby, namely table tennis.

MORE FLEXIBLE IN PRODUCTION

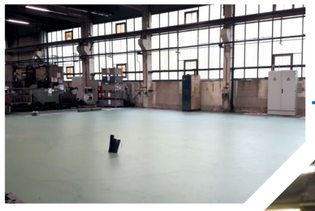
New rotor machining centre commissioned at the VEM factory in Zwickau.

There were smiles all round at the VEM factory in Zwickau last month. Preparations for the installation of a new rotor machining centre had lasted two years; the new centre was finally commissioned in mid-October. Project manager Tony Franke is happy to point out the benefits for the production department and – at the end of the day – also for VEM customers: “We are now much more flexible when it comes to re-tooling, which means that much smaller batches can still be machined economically. At the same time, it is no longer necessary to hold as many parts in our stores.” That applies both for standard and special motors. The new machining centre enables VEM motors Thurm to stay abreast of a growing trend. The market is demanding smaller batches of products for specific applications. The specialists in Zwickau viewed the carefully planned investment as a complex task from the very beginning.

The previous production line, which was removed to make way for the new machining centre, occupied much more space than the new one. “We have gained a great deal of extra floor space and were thus able to restructure our rotor manufacture,” Tony Franke reports. “As a result, we could spruce up our entire machinery base, and that has been really beneficial for our production processes.”

The previous rotor line

Plenty of extra space in the hall after removal of the old production line



Subsequently, the floor was also renewed.

And this is how the VEM production hall in Zwickau looks now.

HOW CEMENT MILLS GRIND MORE

VEM develops vertical asynchronous motor for new MAX 6000 gear unit.

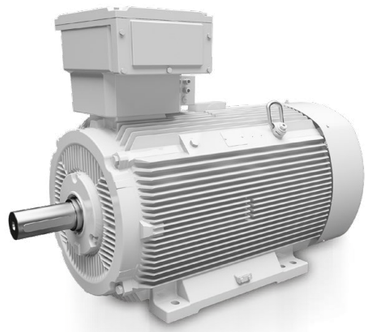
The leading manufacturer of cement mills is currently developing concepts to raise the throughput of its vertical mills. VEM can point to longstanding success as a supplier of drives for cement plants, including many for the FLSmidth group in Copenhagen. In cooperation with group company FLSmidth MAAG Gear in Winterthur/Switzerland, a vertical asynchronous motor with an output of 5.9 MW has now been developed for the new MAXGear system. Two of these motors will in future drive each mill gear unit.

The motors were designed specifically for this application. As a first step, the full width of the available installation space was exploited in order to keep the machine height as low as possible. The second step was targeted adaptation of the motors for converter-fed operation. That improves utilisation and serves to minimise the volume of the motors. The result is a slim drive which is relatively immune to vibration, despite its vertical construction.

IE4 ASYNCHRONOUS MOTORS FOR LOW VOLTAGES

With 2- and 4-pole versions for outputs from 75 to 400 kW, VEM is expanding its range of IE4 asynchronous motors. This enhanced efficiency classification enables not only reduced energy consumption, but also lower winding and bearing temperatures.

The shaft height-to-output assignments correspond to those of IE3 motors from VEM.



FIT FOR CONVERSION

Stock motors can be modified to customer specifications and supplied at short notice.

A new service introduced by VEM permits customers to realise their desired modifications of certain stock motors without undue waiting times. This service is offered initially for the output range from 7.5 to 500 kW. The modified motors are ready for shipping within no more than 36 hours.

Information on the modifications which are possible can be obtained from your sales partner. Orders are then submitted in the usual manner. Outside normal business hours, you can in future contact us by telephone on +49 3943 68-3000 or – with immediate effect – by e-mail to lagermotoren@vem-group.com.

This service is VEM's response to a market which expects to be able to order specified motors also in smaller numbers. Deliveries are realised not only at short notice, but naturally also in the same high VEM quality to which users are accustomed.

Conference

16TH TECHNICAL CONFERENCE – A RESOUNDING SUCCESS

Energy efficiency was a central theme throughout the two-day event.

After last year's 15th Technical Conference had moved future-oriented concerns into the spotlight under the heading of "Industry 4.0", the organisers returned the focus of the latest get-together in October 2017 to trends in classic electrical engineering and electric machine manufacture. Some 220 participants gathered at the Harzer Kultur- & Kongresshotel in Wernigerode to listen to a total of 19 presentations given by experts representing industry and research, the universities and practical users.

A very broad spectrum of topics was embraced. One analysis, for example, assessed the outcome of plans to reduce carbon emissions through the use of energy-efficient motors. The conclusion: There have been no relevant savings to date. Another presentation on the possible use of 3D printers in the manufacturing of electric machines met with particularly great interest.

All about energy efficiency

A thread which ran through the whole two-day event was the discussion on enhanced efficiency and ever stricter energy efficiency classifications. Here, too, the speakers and their audience were generally of the same opinion: More is not necessarily better, and higher degrees of efficiency can also be achieved without new energy efficiency classifications. In this context, integrated consideration of the complete drive system continues to gain in importance. With regard to the designing of innovative drive systems, modern drive controllers and motor technologies already constitute a state of the art with which practically all demands can be satisfied.

Revised standards and improved materials, such as new metals and insulation systems, support the further optimisation of individual components. Software tools enable drive solutions to be adapted perfectly to specific tasks. This year, the event did not end in the usual manner with an announcement of the dates for the next Technical Conference. Instead, Wernigerode is to be the venue of the first CEMEP Conference on 13th and 14th September 2018. Everyone who is interested in participating can register via their national branch associations, which in Germany means the ZVEI, among others. The regular Technical Conference series will then resume in 2019.

The dates for the 2019 conference will be announced in good time.

Continued on the next page

Continued from page 9

Ralf Pliquett
NORD DRIVE-SYSTEMS

"The perfect organisation of previous Technical Conferences meant that my expectations were high. But they were nevertheless satisfied yet again this year. As a platform bringing together representatives from industry, applied technology research and the colleges and universities, the series has earned a wide reputation. This year's meeting also addressed visions for electrical engineering in the future. I was especially impressed by the presentation on 3D printing using metallic materials. It provided an exciting outlook on how this technology could be used.
The demands for ever higher degrees of efficiency were rightly dampened during the course of conference, as currently available motor versions already offer very high levels of efficiency. Further enhancements of motor efficiency would lead to disproportionate increases in costs. It is more important to view the efficiency of systems as a whole, as has been discussed in past presentations. Our company can look back over a long and close partnership with VEM. For myself, as a design engineer, that is best reflected in the way we share our experiences. In this respect, I hope that my contribution on laminated cores in rotating electric machines was also useful to others."

Wolfram Maier
Motor-Press GmbH

"This was the fourth or fifth time that I have attended the Technical Conference. The most interesting topics for me and my colleagues are those which help us in our sales activities. I would like to see more such topics on future agendas.
Our company has worked with VEM since the early 1990s. As a dealer in South Africa, we initially stocked and sold large numbers of standard motors. The picture is now very different, however. Today, we offer several motor programmes, such as roller table, slipring and converter-fed motors, and VEM is our main supplier. We serve the markets south of the equator and increasingly also in the USA. Over the 27 years of our partnership with VEM, there have been practically no complaints from our customers. My personal opinion is: VEM motors come at a price, but they are also better than everything else which is available on the market."

Alexander Wilhelms
Behnke Group

"I only joined Behnke six months ago and, coming from an entirely different branch, this was my first Technical Conference. My colleagues have been attending for many years, however, and so I have heard a lot about both the annual events and the decades of cooperation between our company group and VEM. The fact that we receive practically no negative feedback about our products can also be attributed to the quality of the VEM drives we use.
When I decided to come to the Technical Conference, I hoped to learn more about the strategic future of our branch, as well as the technical and legal frameworks within which the industry operates. These expectations were definitely met. The presentation by Prof. Ponick on 3D printing in electric machine manufacture is a good example. This new technology will shake up the whole branch and will have significant impact for prototype development. That is one thought which I am taking home with me. And I am looking forward to future research and development results. I believe that Germany can be a pioneer once more, provided we manage to bring data transmission rates and bandwidths up to international standards by creating the necessary infrastructure around the country."

Dr. Peter Zwanziger
CEMEP

"Ten years on from the initial regulation of the market for industrial energy-saving motors in Europe, it is time to look back and compare the results attained against the high expectations relating to climate protection. In the meantime, non-classified motors are already treated as pariahs in some respects. Over the past years, manufacturers have spent around one million Euros per motor size for each step up in IE class, so as to realise the demanded transformation of the market. And that does not even include their contributions to the work on standardisation. To date, however, there is nothing in the generally available statistics in Germany to show that the desired reductions in industrial energy input or carbon emissions have actually materialised.
On the other hand, indirect indicators such as the industrial gross value added per tonne of CO_2 emissions paint a different picture. The efforts undertaken by German industry have been successful since as far back as 2001, i.e. some ten years before the first stage of the legislatively imposed energy efficiency improvement became effective. We as CEMEP, the umbrella association of the European drive manufacturers, ask the EU to take such facts into account before they pass any even stricter component regulations. The third stage of the energy efficiency regulations came into force in 2017, and it is generally acknowledged that it will be around 15 years before all the motors in use have been replaced. In our opinion, we should wait this time and then assess the results before discussing the need for new rules. Investments in the greater utilisation of renewable energy sources, in energy audits for industrial installations and further industrial electrification would better serve climate protection."

"The EU philosophy with regard to energy efficiency assumes that, for existing technologies, the required energy efficiency class must be raised by at least one level in order to create an incentive for technological progress. Ten years ago, this role was assigned to IE4. In the meantime, we have a standardisation mandate from the EU which explicitly demands IE5. On the other hand, the benefits of each step to a higher energy efficiency class are becoming smaller and smaller. IE5 is now very close to the limit of what is meaningful. In my view, it would have been better to tighten IE4 instead of introducing IE5.

The way we view efficiency has changed. In the past, we tended to look just at the motor, whereas we are now starting to consider the efficiency of drive systems. It is currently uncertain how that might be regulated by the EU. I could well imagine the specification of energy audits, for example. That would mean that the installation of an energy officer would be mandatory in companies of a certain size. These officers would then keep a permanent eye on system efficiency.

This all notwithstanding, energy efficiency is important and meaningful. Not only from the perspective of environmental protection, but also to safeguard Germany's position as an industrial location. Take synchronous reluctance motors. They are simple to manufacture, but their control is complicated and requires complex converters and a higher engineering input. For high-tech countries like Germany, that is an opportunity to differentiate themselves from others on the world market. The other, even more important reason for the fundamental significance of energy efficiency: We are not pursuing environmental protection for the sake of better weather. It is a matter of self-preservation for industry and in the end decisive for the long-term future of humankind. If hurricanes and floods cause more frequent and ever greater damage, there will eventually be no-one left to buy our products."

Prof. Martin Doppelbauer
Karlsruhe Institute of Technology

SHINING BEACON – FAR BEYOND THE LOCAL REGION

VEM motors GmbH celebrated the company's 70th anniversary with an open day in Wernigerode.

Is a company history spanning 70 years a long story or just a brief interlude? For VEM motors GmbH in Wernigerode, the most important thing is that the factory has successfully mastered several major upheavals over the past seven decades of its existence, and has furthermore established a strong reputation as a manufacturer of outstanding electric motors.
The founding of the company can be traced back to a resolution passed by the Chamber of Economic Planning in Magdeburg on 8th February 1946, which decreed that a factory for electric motors was to be set up on the site of the former Rautal-Werke in Wernigerode. The actual birth date of the company can be taken as 31st January 1947. Existing production facilities were repaired as quickly as possible, and the 10,000th electric motor was already delivered in 1953. In the 1970s and 80s, the implementation of new production technologies heralded a period of intense modernisation. Motors from Wernigerode stood in line with the international state of the art and were awarded the coveted seals of quality almost without exception. At the end of the 1980s, there were 1,550 motors coming off the production lines on an average day.

New chapter

After a few turbulent years following German reunification, the factory moved into calmer waters when – together with the VEM locations in Dresden and Zwickau – it was taken over by the Merckle family in 1997. Today, 20 years later, we are now adding a new chapter to the VEM chronicle, and thus also to the 70-year company history of the VEM location in Wernigerode: Mr. Wang from the Chinese enterprise SEC has acquired the company group.

Open day

In Wernigerode, the company anniversary was celebrated with an open day for employees and their families on 2nd September 2017. Many of the guests expressed their attachment to the company during guided tours of the production areas and on the fringes of a colourful entertainment programme. The event also demonstrated the great pride of the workforce. After all, the company enjoys an excellent reputation as a reliable employer, a strong manufacturer and a competent vocational training centre far beyond the local region.

DANIELI GATHERS THE BIG NAMES OF THE BRANCH

800 guests from 70 countries attend an international "Innovaction Meeting" in Buttrio/Italy

The Italian plant engineering company Danieli invited 800 guests from 70 different countries to its so-called "Innovaction Meeting" at the group headquarters in Buttrio during the first week of October 2017. This invitation brought together all the big names of the international metal industry. Together with suppliers, customers and partners, the global market leader for metallurgical plant equipment reflected on the cooperation of past years and looked ahead to future developments and challenges for the branch.

VEM was represented by managing director Dr. Torsten Kuntze and Ralf Hanauer, sales director for the high voltage/drive systems segment. "We can look back over a long partnership with Danieli. We are the company's dependable drive supplier," says Ralf Hanauer. "This meeting was a valuable opportunity to establish further contacts with other component manufacturers, to bring VEM to the attention of representatives of public institutions from all over the world, and to speak with customers of Danieli about possible joint projects."

During a tour of the production facility, the guests were also able to visit the company "showroom", which was set up in 2016 and has been operating reliably ever since. Danieli uses this plant to demonstrate the performance capabilities of Danieli frequency converters in combination with VEM motors and Danieli rolling mill equipment to potential customers.

The "showroom" at Danieli

The award-winners with their XL tram at the TRAKO railway fair in Gdansk

COMPETITION AWARD FOR ENGINEERING ACHIEVEMENT

The new XL tram manufactured by Solaris was certainly an eye-catcher at the TRAKO railway fair in the Polish city of Gdansk at the end of September 2017. And there was good reason for the 14 representatives of the manufacturer, the predominantly Saxon suppliers and the Leipzig Transport Authority to look so happy on our photo: Solaris received one of the most important trade fair awards, the "Ernest Malinkowski Award" for particular engineering achievement. VEM supplied the traction motors for the XL tram.

Polish manufacturer Solaris has worked with established German partners, including VEM, for many years. In the case of the international project honoured at this year's TRAKO fair, almost 60% of the value creation was located in Germany.

The new exciter

INNOVATION FOR RAILWAY GENERATORS

New 24 V exciter developed for Stadler

One of the innovations presented at the recent TRAKO fair was a 24 V exciter for the generators of diesel-electric locomotives. It was a joint development of VEM and F&S Process Automation for customer Stadler Rail. VEM has worked closely with F&S for many years. The new exciter is installed in the locomotive like a computer and controls the current and voltage for the generator.

A CAN bus provides for recording of the communication protocol. The engineers at VEM have designed the exciter such that it could also be interesting as a complete solution for other customers in the transportation industry. When doing so, they were able to call upon VEM's many years of experience in the manufacturing of traction machines for rail vehicles.

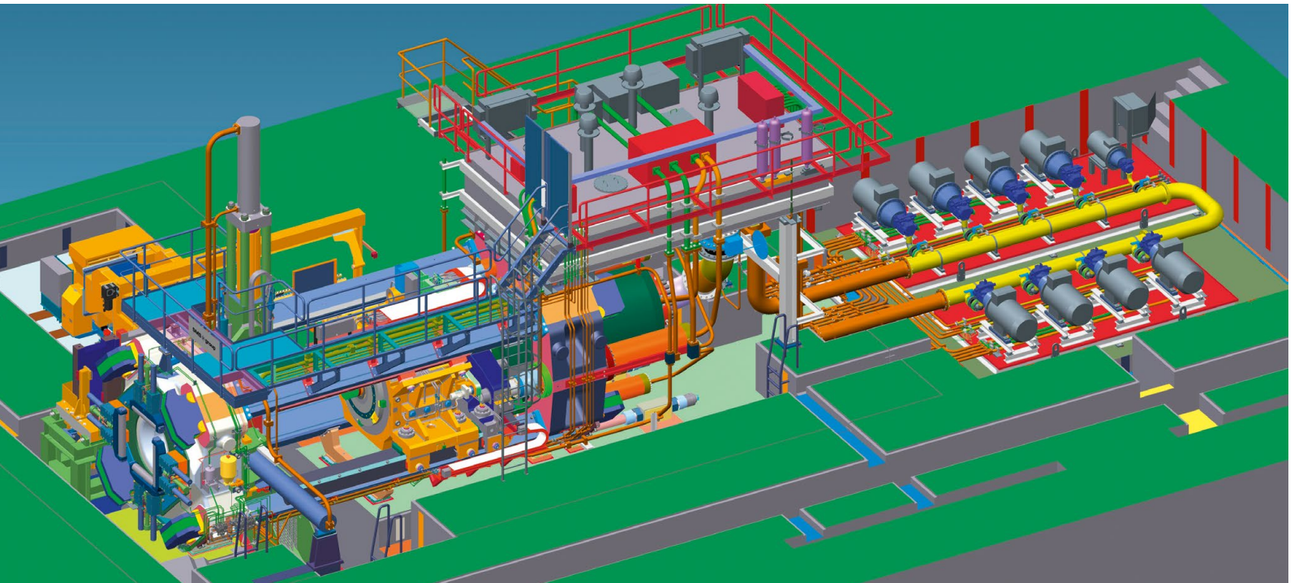
ALUMINIUM EXTRUSION PRESS TO ENTER SERVICE IN SPRING 2018

VEM motors bearing the China Energy Label contribute significantly to energy savings on Chinese plant.

The Chinese company ZMT from Xingyang, Zhengzhou has ordered energy-efficient drives from VEM for an aluminium extrusion press. The ten motors with outputs from 22 to 160 kW are to be incorporated into the hydraulic pump drive and are the first VEM motors to bear the China Energy Label. It is not least thanks to these motors that energy savings of up to 25 per cent are achieved compared to conventional presses.

VEM is working together with the SMS Group on this project, for which SMS is supplying the 82 MN extrusion press for the production of large-format extruded aluminium profiles. The press is scheduled to enter service in spring 2018. The profiles are used in transport engineering and railway construction, primarily for the Chinese high-speed rail network.

Computer model of the aluminium extrusion press



On the road to Industry 4.0

DIGITISED LOGISTICS: WERNIGERODE GEARS UP FOR THE FUTURE

The recent digitisation of stores management procedures will further accelerate all future purchasing, production and dispatch processes at the VEM location in Wernigerode. "One decisive prerequisite was the introduction of a common machine-readable notation throughout the whole factory," says Ralf Lustig, project engineer at VEM motors GmbH. A common coding system defines the overall logistics structure and assigns unique logistics coordinates to each of the more than 6 000 storage locations in the high-bay racks and block warehouse. In the latter, special signage identifies more than 1 000 locations, while the stores for the production areas use multi-level labels.

With such digitised logistics, VEM motors is geared up for the future. In fact, it is already noticeable that processes run faster and more smoothly, and that sources of error have been eliminated. By taking this next step towards implementation a supply chain management philosophy which is widely known from the automobile industry, VEM plans to further enhance its reliability as a supplier. Against the background of the 70th anniversary of VEM motors this year, that is clearly an investment in a sustainable future.

"One decisive prerequisite was the introduction of a common, machine-readable notation throughout the whole factory."

FIRST MACHINE SET SUCCESSFULLY COMMISSIONED

VEM masters unusual framework conditions for a nuclear power project in Finland.

In 2011, Siemens Finland approached VEM transresch GmbH with an enquiry regarding the development, testing and installation of four rotating motor-generator sets for a Finnish nuclear power plant. The systems concerned had already been in operation for over 30 years and had reached the end of their service lifetime.

Unusual framework conditions

The special challenge of this project was posed by a number of usual framework conditions. To ensure the highest possibility operating reliability, no components anywhere in the system were permitted to incorporate microprocessors of any kind. In addition, earthquake safety, climatic resilience and electromagnetic compliance had to be demonstrated by full-scale prototypes. All development, manufacturing and test processes were closely monitored by both the nuclear plant operator and the Finnish Radiation and Nuclear Safety Authority (STUK). The first machine set comprising control cabinet, motor and generator, was successfully commissioned in August 2017.

Uninterrupted power supply

The motor-generator sets serve to ensure an uninterrupted power supply with a maximum output of around 70 kVA to the process-relevant and above all safety-critical subsystems in the power plant. Functions handled in the control cabinets include regulation of the motor speed, generator voltage and other parameters. In addition, they facilitate synchronisation and the emergency switchover to a back-up system in case of any failure of an individual machine set. The annual operating time of the systems adds up to more than 8200 hours.

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