

The MARITIME EXECUTIVE

April 2008

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Vice President
Business Development

EPD

Electronic Power Design, Inc.

Designing a World of Power

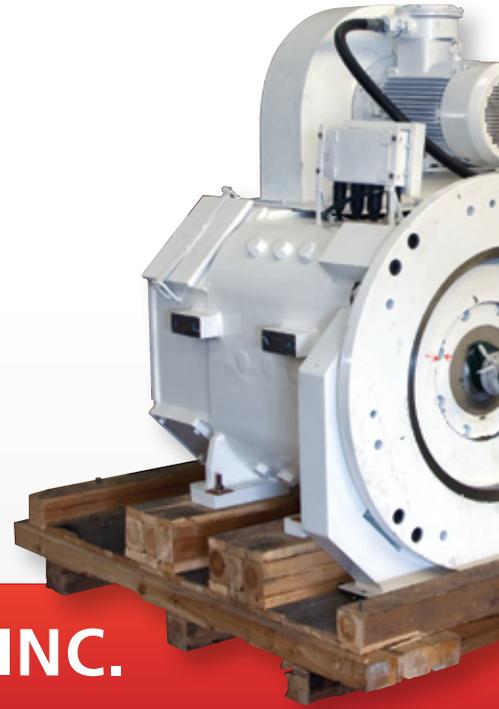
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EPD



ELECTRONIC POWER DESIGN, INC.

Designing a World of Power

By Tony Munoz

Electronic Power Design, Inc. (EPD) first came to the attention of MarEx when our staff was developing the Rigdon Marine edition in November 2006. EPD's cutting-edge power and control systems' design for next-generation platform support vessels has been acclaimed as a major breakthrough for the offshore industry. However, the company also engineers and manufactures automated electrical power systems for many different industries. EPD's growth and worldwide expansion are what The Maritime Executive is all about—benchmarking excellence for others to measure.

EPD is a fascinating case study in engineering and marketing. The firm built its reputation on the skills, experience and innovative knowledge of John Janik, its founder and President. Today, EPD Inc. (Houston) and EPD Asia Group (China) are considered among the top design/engineering and manufacturing companies in the world for automated electrical power systems. The company is also recognized for its work in harmonic solutions for a wide range of power systems, either utility feed or generated.

After graduating from Texas A&M with a Bachelor of Science degree in Electrical Engineering, Janik was hired by General Dynamics (GD) to work on the military's F-16 Fighter Jet Program. In 1983, GD had discovered that when the F-16's inverter came online it produced excessive harmonics, which created AC power system disturbances. It was a "phantom" problem and a mysterious issue that could bring these technologically-advanced planes down. The young Janik had the good fortune to work alongside some of the greatest avionic minds in the world to solve disruptive-power-harmonics problems.

At the time, the science of harmonics in power-drive systems was a completely neophyte discipline, and there was simply no scientific experience with the switching algorithms that were burning up power supplies. General Dynamics formed a new engineering group called Power

Systems and Controls, which became responsible for all the plane's power supplies and complete generator-power systems. Janik was responsible for learning every nuance and function of the 10-KVA generator and its constant frequency output PWN inverter box. The experience of fixing harmonics in planes put Janik at the center of the next generation of applied sciences for any type of generator power system.

Founding Electronic Power Design, Inc.

In 1985, defense budgets were severely cut by the U.S. government, and GD began laying off workers. Janik was asked to return to work as an engineer for an electrical company that he had worked for as a teenager. Although his education was based on AC drives, Janik was soon designing DC drive controls and printed circuit boards with Op Amps, resistors, transistors and other discrete components.

In 1986, after the oil industry crash, Janik's main industry focus was dredging and designing diesel electric power systems for the dredging industry. Knowing that he was an excellent engineer with the drive to succeed, the 25-year-old Janik decided to take the risk of forming his own company to service these dredging customers. This was the beginning of Electronic Power Design. Janik's reputation as a talented field service engineer with a few advanced designs began to spread. Soon he was busy commissioning and servicing more and more equipment for the dredging industry. This quickly led to EPD's becoming an electrical power and controls system manufacturing company.

In 1986, John Norwood, currently Vice President of Business Development for EPD, was at the University of Texas. He began assembling circuit boards for Janik to earn extra money for school. Norwood decided to leave college in 1988 and started working for EPD in printed circuit board design, controls wiring and whatever else EPD needed at any given time. From there he moved to CAD drafting, purchasing



All photography in this article courtesy of Tim Fulton.

and then eventually to sales. These skills, plus his previous work with AC/DC motors, transformers, switchgear and DC drives, made for a good “hands-on, real world” education that he uses in his capacity at EPD today.

Reputation + Opportunity = Success

In 1990, EPD was growing from a small electronics company to designing and commissioning diesel electric power systems and variable speed drives for operators in the dredging markets. At the same time, gambling laws were changing throughout the U.S., and gambling boats became all the rage. These boats were required to float and have a certain amount of propulsion power. They were also required to be built to marine classification society standards. As the dredging business slowed, EPD began working on casino boats in Indiana, along the Mississippi River, and on the Gulf Coast. The company was soon in a much larger facility and began hiring more employees.

During the early 90s, the oil field market began picking up as well because of new technology that allowed drilling at deeper and deeper depths. While EPD had little experience with offshore support vessels, drilling rigs or production platforms, Janik and Norwood began finding projects in the oil field. It was a natural step moving from dredges and casino boats to propulsion systems for platform support vessels (PSVs) and drilling systems for the offshore oil market.

“The common theme about all of the marine applications we worked on was the classification requirements,” said Norwood. “Whether the design and commissioning were for a casino boat, a suction dredge, a cutter type dredge, a platform support vessel, or if we were working on a generator power system for a drilling rig, every generated power system required a class society’s approval.” Norwood also stated that “the other commonality was limited space. All marine installations are limited on space, especially when it comes to electrical equipment, which in the past was always an afterthought.”

Soon another sea change began taking shape throughout the world.

During this time, analog systems drove industrial power; but digital microprocessors were coming on the scene in industrial applications, and EPD clearly understood it was the future. Furthermore, as the oil and gas industry and the marine industry were being legislated to become more environmentally responsible, EPD began designing digital power systems with microprocessor controls, variable speed drives and fiber-optically connected, PLC-based control systems, which allowed these industries to modernize with diesel electric systems and meet the environmental standards that society and governments demanded from them. This is also the time EPD allied itself with Siemens Energy and Automation. Siemens offered a wide range of modern “off-the-shelf” products that EPD could use and apply to a specific industry or application.

EPD began working with Global Marine Drilling and Sonat (now Transocean) on their semi-submersible and drillship drilling rigs. The first was a retrofit of an old 1970s’ German system, and the other was the installation and commissioning of a completely new system. Then companies such as Transocean, R&B Falcon, Global Marine Drilling, Diamond Offshore, Atwood Oceanic and Noble Drilling, which worked for Shell, BP, ExxonMobil and the rest of Big Oil, began calling the company. EPD became the “go-to” guys for moving from analog to digital systems for power generation and controls for the drilling industry worldwide.

Reputation + Success = Global Expansion

EPD’s reputation for innovation began opening many doors of opportunity for the company and, with Houston being the center of the world’s oil and gas industry, working on equipment around the world was not uncommon.

Global Marine Drilling decided to upgrade its drilling capacity and bought a famous ship called the Glomar Explorer, which was involved in retrieving a Russian nuclear submarine off the coast of Hawaii in the mid- 70s. Global decided to turn the ship into a drilling rig, and

“Instead of the finger-pointing that happens when too many are involved, somebody needs to take responsibility for commissioning the vessel. EPD’s electric plant integration is that commitment. It allows vessel owners to get the integrated electrical power system they want while maintaining an easy separation between owner-furnished and shipyard-furnished equipment.”

EPD was awarded the retrofit for the propulsion and drilling systems. The company added approximately 50,000 horsepower of Siemens variable speed drives with switchgear and automation to the rig. In addition to the Glomar Explorer, EPD also worked on the Glomar Celtic Sea, a semi-submersible floating hotel converted to an anchored, semi-submersible drilling rig. The very first offshore contract EPD was awarded was the DC drilling system retrofit of an old Sonat rig named the Offshore Amirante. EPD used Siemens digital technology to modernize this 1970s’ vintage drilling rig. Known for designing, building and commissioning quality drilling systems, EPD soon began doing field work on other Siemens products in the Gulf Coast region.

In terms of drilling rigs, EPD has provided equipment on numerous projects for drilling companies worldwide. It has provided digital power systems and/or controls for the drilling, propulsion, anchor windlass, BOP transport, compressor and pipe racker systems on these rigs. As the company worked more and more in the drilling industry, Janik and Norwood met many new people. It was around this time that EPD was introduced to Tidewater, one of the largest offshore support companies in the world. Janik and Norwood began meeting with Larry Rigdon, a senior executive at the company at the time. Tidewater was interested in building some new, state-of-the-art, DP-2 class diesel-electric platform supply and large anchor handling vessels, and EPD was brought in as part of the design team. EPD designed and specified the integrated electrical power systems for both vessel types. It soon became evident to Rigdon that EPD was a sophisticated design and manufacturing company with innovative designs for power generation and, specifically, diesel-electric propulsion.

Additionally, part of the arrangement was that EPD could create the designs for the integrated power systems and would not be precluded from bidding on the manufacturing of the equipment. Consequently, the EPD staff spent many months working with Tidewater executives in New Orleans and with the builder in Norway. In all, EPD assisted with the building and delivery of 12 new vessels for Tidewater.

Forward Thinking + Knowledge = A Sea Change for an Industry

“The drilling industry has used diesel-electric power generation on oil rig platforms for many years,” Norwood said. “And this technology was nothing new to EPD. When Larry Rigdon started his own offshore support company, he wanted to build a smaller support vessel, which could transport more cargo than larger vessels that demand similar day rates and be faster in the water with less fuel burn. He asked EPD to join the process.”

Rigdon hired Guido Perla and Associates (GPA), a naval architectural firm in Seattle, to design the GPA-640 class of PSV, which later was renamed the Rigdon 5000 class. EPD was brought in to design the integrated electrical power system for the new diesel-electric boats. GPA and EPD had collaborated on a number of high-profile casino boats during the 90s, and there was a high level of synergy.

Rigdon had over 30 years of experience in the offshore support industry, and he understood what type of vessel was needed in the offshore markets. He also knew GPA had designed a number of vessels

with advanced hull configurations, which provided speed and comfort and burned less fuel. Added to this, he knew that EPD was an innovative designer of integrated electrical power systems. The assembled teams began working on a vessel that would revolutionize the offshore industry. The GPA 640 would use dynamic-positioning (DP-2 systems) and a diesel-electric power generation system in an advanced hull design. By removing the traditional shafts that ran the length of a conventional diesel vessel and replacing them with diesel-electric power, which ran cables down the sides of the hull, the new, smaller vessel could transport more payload cargoes in the tank farm system. The team collaboration completely changed the dynamics of the offshore support industry and brought forth the first modern design in over 20 years.

After Rigdon built the GPA-640s he began working with EPD and Guido Perla on a new GPA-654 PSV design. Rigdon’s strength lay in the way he built the boats. First, he wanted to build boats in a series, and he contracted with a shipyard to build 10 identical vessels, one after the other. As a savvy veteran of the marine industry who was familiar with shipyards, Rigdon wanted the ships built quickly and inexpensively. While the yards are good at cutting steel, welding and construction, they often have problems commissioning the power systems. Rigdon was aware of this problem and hired EPD to design the GPA-645 with a containerized house for the integrated electrical power system components. This house became the vessel’s Engine Control Room (ECR). With this new design Rigdon could owner-furnish an integrated electrical power system installed and tested in the vessel’s ECR. The shipyard had only to remove various panels on the outside of the ECR and hook up the power and control cables. EPD would then verify the shipyard’s connections, unlock the ECR and begin powering up the various systems.

“Piecing together electronics and components of an electric power system is not a good idea,” John Janik said. “Instead of the finger-pointing that happens when too many are involved, somebody needs to take responsibility for commissioning the vessel. EPD’s electric plant integration is that commitment. It allows vessel owners to get the integrated electrical power system they want while maintaining an easy separation between owner-furnished and shipyard-furnished equipment.”

John Norwood admits there is a little more cost on the front end to purchase a totally integrated ECR; but with the ship being assembled quickly and the commissioning process greatly reduced, it is less costly in the long run. The faster a vessel gets delivered, the faster it can go on hire to earn income. In the past, the shipyards built and wired the control rooms, which usually delayed vessel deliveries and upset vessel owners. This approach helps reduce this time/cost.

Today, Rigdon and the French offshore giant BOURBON are still building modern diesel-electric, dynamically positioned offshore support vessels. EPD has been contracted to provide the integrated ECR electrical power systems for almost one hundred offshore support vessels for these two companies. They consist of DP-2 class PSVs, Anchor Handlers and DP-3 class IMR vessels, all of which are complete ECR-designed as part of the vessel’s hull and sent to the yard

for welding into the ship. If the yard can not get inside the container, it cannot be responsible for any problems within the ECR during commissioning. With this method the yard gets a few motors, an ECR and a few consoles, which they have to connect. EPD has additionally found ways to greatly reduce the need for huge tonnages of air conditioning traditionally required to cool the ECR and its equipment, without water cooling.

Another unique process being implemented for these Rigdon and BOURBON vessels is no-load testing of the integrated electrical power system with the vessel's actual engine/generator sets, which are supplied by Cummins Mid-South for the Rigdon vessels as well as for the BOURBON vessels. Cummins sent a shipset of engine/generator sets to EPD's plants in Houston and China to be connected and used during factory testing. Testing the generators offsite at EPD greatly reduces dockside testing and commission. This is another innovative way to get the vessel working faster and is very cost-effective on a multi-vessel order.

Rigdon and BOURBON have been on prolific building programs since 2002. Rigdon is about to finish building 20 new vessels, and BOURBON is nearly finished building approximately 125 new offshore vessels. EPD has provided or is providing the integrated ECR power systems for most of these vessels.

EPD's first experience with diesel-electric systems came while working on casino boats and dredging vessels. In the past, Europeans built a number of diesel-electric vessels utilizing AC variable speed drives and motors, and when EPD first started powering vessels there were not many companies working with DC variable speed in diesel-electric systems. The U.S. drilling markets were used to DC variable speed, which is commonly used on over 85% of the world's drilling systems today. Because of this, these new diesel-electric integrated ECR systems are using DC variable speed technology. EPD also offers and supplies AC variable speed systems as customers or applications require. In the past, few shipyards or owners were willing to pay for a total integrated electrical system. Consequently, EPD sold numerous AC and DC drives and motors for bow-thrusters as well as other power system components. It was not until Rigdon Marine and BOURBON wanted to build vessels fast and economically that EPD had the opportunity to design and build an entire electrical power system house in the ECR for marine applications.

Bringing Clean Power to the World

The offshore industry has offered EPD the growth and opportunity it needed to become a major player in designing, building and commissioning electrical power systems. The company now has a vast wealth of experience and applications knowledge from working in many different industries. Being strategically located in the world's energy capital, EPD has developed systems in the petrochemical industry and in the product manufacturing industries. Whether it has been developing control systems for the cement industry or for the extruded plastics industry, EPD



EPD Engineers



EPD Accounting and Human Resources



EPD Marketing and Administration

case study: **electronic power design**

John Norwood joined the company a couple of years after John Janik founded it, and Amy Gardner joined the company in 2005... Amy brings with her 20 years of banking/finance experience. Together, these three have an eye for bringing in talented engineers to further the growth of the EPD companies. "Growth is good, but it has to be measured," said Janik. "We have been fortunate to find the impressive talent needed to build a global company."

creates and manages raw electrical power so that businesses can function profitably and efficiently.

Furthermore, John Janik is regarded as a bit of a genius when it comes to harmonics and harmonic mitigation. While there is seldom a right or wrong answer in dealing with harmonics, or even a published science book to guide an engineer, Janik understands the complexity of harmonic interference in power systems. No matter if it's a manufacturing plant, refinery, or vessel, harmonics is often an issue.

EPD is now working on developing systems for the mining industry in South America. From digging for gold to mining other minerals, they all must use electric power and control systems. EPD has recently hired a marketing executive to manage business development in a wide range of industries throughout Latin America. EPD has also done work in wind generation and completed test stands for a large California company that was developing wind farms. The company sees wind generation in South America as a rapidly growing industry.

EPD has been able to penetrate a number of industries because of its applications knowledge. No matter how good the equipment is, if the application of supplying electrical power is not appropriately managed then the equipment will not function to capacity. Whether it be

pumps, cranes, winches, drilling applications, plastic extrusions, kilns, fans and every power application conceivable, Norwood says moving into any industry is easily done. A propulsion unit for a vessel is simply a pump, and the dynamics are the same: A fan moves air and a propeller moves water. From industry to industry, the need to maximize the performance of equipment is the driving factor for systems applications rendered by EPD.

EPD is a "Siemens Solution Partner." It predominantly utilizes Siemens products and services Siemens products in the marketplace. EPD does, however, offer and utilize other major manufacturers' components to achieve a cost-effective solution for its customers.

EPD Team-Building

Over time, EPD has built a team of engineers and designers recruited from Texas A&M and other universities around the South. By virtue of the need for qualified talent, the recruitment of young minds allows the company to send these new recruits into the field with qualified and licensed engineers to learn through on-the-job training.

During the '70s, power systems were analog, which means they were not computer-controlled. Today, with the proliferation of computer-

control technology, the engineering and design of electrical power systems have become a young person's endeavor. As microprocessor controllers have taken over the electric power systems industry, most systems have moved from simple relay logic to advanced automation. Young engineers tend to be in front of this type of learning curve. Being a leader in the digital age, EPD's young talent pool tends to be computer-savvy people fresh from major universities who undergo intense field and classroom training while at EPD.

Because of EPD's global expansion and work on projects around the world, the company's staff and senior management have grown three-fold. John Norwood joined the company a couple of years after John Janik founded it, and Amy Gardner joined the company in 2005 as part of the expansion of EPD to serve as the Vice President of Finance and Administration. Amy brings with her 20 years of banking/finance experience. Together, these three have an eye for bringing in talented engineers to further the growth of the EPD companies. Meeting with their staff in China and Houston, MarEx found that the company is thriving on the energy and enthusiasm of its employees.

"Growth is good, but it has to be measured," said Janik. "We have been fortunate to find the impressive talent needed to build a global company. Everyone has a sense of success, and it is witnessed in their work ethic and commitment to move the company to the next level."

MarEx



Executive Interview

with John Janik

President and CEO, EPD, Inc. and EPD Asia Group

MarEx: When did the company begin, and what type of project were you involved with at first?

Janik: I started EPD in 1986 as a one man company providing field engineering services. I was also the principle designer/engineer for the generator controls, electric propulsion system, and the dredging power system and controls for a 14,000 horsepower hopper dredge named the "Atlantic-American" owned by Atlantic Trailing Company.

MarEx: EPD is a recognized worldwide leader in electronic power systems. Explain some of the unique systems designed over the years.

Janik: At Texas A&M, part of my curriculum as an Electrical Engineering student was to study inverters and converters as well as courses in electric utility design and power systems. I was hired by General Dynamics (GD) right out of school and became part of its F-16 Fighter Jet Power Systems & Controls team.

I was fortunate to work on 'harmonic simulators' as well as the 'Stand-by Inverter' design for the jet's back-up power system. The F-16 was having issues with its inverter and harmonics at the time, and these problems were within my scope of studies and

knowledge. At the time there had not been much published in the field of 'Harmonic Analysis,' and my work at GD put me years ahead of my peers. I even helped review (unofficially) IEEE-519 before it was published regarding Harmonic Problems, Interactions and Propagation for General Dynamics in Fort Worth, Texas.

MarEx: Did you ever consider pursuing a career in harmonics?

Janik: In a way I did. After leaving GD, I founded Electronic Power Design Inc. (EPD), and got involved in a number of diverse projects that included issues with harmonic environments. The first product I designed was the "EPD-100 Synchronizing Filter Board." Our printed circuit board allowed many large and world-known companies' drive systems work in a harmonic rich environment and, in many cases, where they had not worked before. EPD manufactured and sold these printed circuit boards and serviced these power systems all over the world. As a result, we earned a reputation of solving problems for drive systems, even when the actual manufacturer could not solve the problems within their own equipment.

MarEx: So, EPD was a problem solver for after market applications?

Janik: In the days before digital Programmable Logic Controllers (PLCs) were available, EPD designed Analog Printed Circuit Boards for specialized applications, such as our "Constant Tension Winch Controls," which are still in use by DuPont in titanium mines around the world. I believe it was our understanding of how systems applications worked. It's really been the key to our success. Lots of companies can cut and paste "canned" software application modules from PLC libraries. But, if they don't have the experience or knowledge to understand the nuances of what and why things need to be done, then unforeseen problems can arise later.

We have used this background as a spring board to design: electric ship's propulsion systems; drilling systems; pipe rackers and riser rackers for large drillships; harmonic filters-large and small; crane controls; winch power systems and controls; transformers; plastic applications, including mixers and extruders; cement kiln drives and ball mill drive systems; dredging power systems and controls; and mining power systems and controls, and more.

MarEx: Today, the company is well-known for designing, building, and commissioning integrated power systems. What were some of the issues you had to overcome to compete in the global markets?

Janik: First, thing that comes to mind is earning the respect of the multi-national companies. When EPD was a smaller company, it was always an uphill battle. Today, our global reputation serves us well, and our field engineers are working around the world.

MarEx: Can you list some of the countries the company has work in?

Janik: It's a very long list. But, I can best answer that by saying, we have worked everywhere except Antarctica. And, you never know?

MarEx: When did the company begin work-

I was fortunate to work on 'harmonic simulators' as well as the 'Stand-by Inverter' design for the jet's back-up power system. The F-16 was having issues with its inverter and harmonics at the time, and these problems were within my scope of studies and knowledge. At the time there had not been much published in the field of 'Harmonic Analysis,' and my work at GD put me years ahead of my peers. I even helped review (unofficially) IEEE-519 before it was published regarding Harmonic Problems, Interactions and Propagation for General Dynamics in Fort Worth, Texas.

for the ship designers to work that way, it caused lot of big issues during construction.

By spreading the equipment out all over the ship, this made the inter-connections of the electrical circuits an extensive and expensive job. Additionally, the many fragile electronic systems were exposed to the welders, grinders, painters, pipe workers and other tradesmen while building the ship and a lot of damage

MarEx: EPD works in alternative energy markets such as wind power turbines. Explain the growth of those markets, especially in Texas, which is known as the wind turbine capital of the world. How can your integrated applications be useful?

Janik: While, this is a very complex issue to discuss in this venue. Primarily, because it involves power system stability and control



ing with the offshore energy industry?

Janik: Actually, much longer than most folks realize. During the mid-90s, EPD was hired to do a retrofit on a large semi-submersible drilling platform. We were tasked to change old, outdated drilling drives for a more modern system. We also built new winch controls, new driller's console and controls, new mud pump consoles and controls, and a new SCR drive line-up, and more. It was a retrofit that included fiber optics, which was new on drilling rigs.

MarEx: EPD designed a new way of constructing electronic power systems in offshore support vessels. Please explain some of the issues that were confronting the owners of these vessels and the approach taken to solve their problems?

Janik: It has been our experience that naval architects design a vessel based on the owners' desired tonnage size, projected cargo capacities, and projected speed requirements. The ship would be designed and the major components were shoved in wherever they would fit.

As you can imagine, this approach has serious problems. From our perspective, as the electrical power company, the electrical systems were scattered throughout the vessel, because it was just easier to put the components anywhere they would fit. And, while it was easier

was sustained by sensitive components.

Obviously, when it came time to commission the power on the ship, invariably some important component was damaged. A lot of finger pointing took place and nobody wanted to pay for the damaged equipment. This type of situation does nothing more than create problems between the shipyard and the vendors as well as between the shipyard and the owners, and nobody wins this kind of battle. As you can imagine, the commissioning process took a very long time with expenses running up over budget, including the lost time and revenues for the ship's owner.

EPD lobbied to be a part of the initial design of the vessel. By working on the initial design, we knew we could solve problems by designing solutions for the electronic controls and power systems. On the Rigdon and BOURBON vessels, our company designed a containerized module that housed the electrical equipment. The equipment was pre-commissioned and, most importantly, protected from the working environment. Once, the validity of this approach was accepted and it was evident that the construction process had been greatly expedited; we realized that we had been an integral part of a shipbuilding revolution that included Rigdon Marine, BOURBON Offshore, and Guido Perla and Associates.

and the prevention of undesirable power system interactions with windmills and other alternate energy systems, which are not available to produce power 100 percent of the time.

Alternative energy issues have caused utility companies fits. Historically they have stayed away from these types of power sources because the power cannot be controlled in a consistent and reliable manner. With energy costs rising and global warming on everyone's mind, these same utility companies are now forced to deal with these complex issues. The number of companies with a core competence in this area is rather small, which strategically puts EPD in a very good position to participate in these markets.

MarEx: Recently, EPD Asia opened in China. Explain some of the reasons for the investment and what future growth China might offer EPD?

Janik: The impetus for our investment in China was a large contract we obtained to build and ship equipment from Houston. Logistically, it just made sense to be closer to the customer. Being across an ocean and outside a time-zone just wasn't the way I wanted to do business.

There were some other benefits as well. Since, our new plant was inside an Export Processing Zone near Shanghai, we were able

to mitigate the Import/Export taxes that we would otherwise have to deal with. Additionally, this location also enables EPD in Houston to effectively support the Chinese organization in several different ways. One important factor is that between EPD Houston and EPD Asia Group, we are able to be working for our clients on a normal work schedule 24 hours a day. This allows us to support customers around the world more effectively.

Furthermore, from a purely business point of view, by operating our businesses in different economies and on different continents, we can hopefully remove the peaks and valleys from our operations and financials. Currently, we send employees back and forth from China to Houston. Since, the companies are integrated; staff and support can easily be shifted where it's most needed.

MarEx: *Today, China has the world's attention as a major player in the world economy. Tell us about the experience of working with the Chinese, in terms of doing business in the country, and about the quality of the workers.*

Janik: I must say that this is the most surprising thing of all. Just about every negative thing that Americans think about China

is not true, and there are also some positive things that are not true either. All in all though, life in China is not that much different than in the U.S., after one gets used to being there for a while. Our experience in Yangzhou, which is about a 3.5 hour drive from Shanghai, is that the government is very cooperative and helpful, more so than what I have ever experienced in the states.

The people are hard working and follow directions exceptionally well. They want very much to succeed. They have a great work ethic and a positive attitude, which is something that easily makes up for their lack of experience. If a company has a good management team in place, the quality of work in China is every bit as good as it is in America.

MarEx: *Recently, you have partnered with Derek Foster a well known designer of dry-type transformers and inductors. In what way does Foster Magnetics compliment EPD's business?*

Janik: I have known Derek for many years. Quite frankly, he is the only person I have been able to call and discuss some unusual project, which is usually followed by, "Can

you build that?" Not only has he always said 'yes,' but he's also been able to design a superior system 100 percent of the time.

When, I discovered that he might be available to join our company, he and I decided to create a new company to design products pursuant to his knowledge, skills and experience. And since we use these components in our products, it was an easy decision to bring transformers in-house. Derek and I have very high expectations for 'Foster Magnetics.' Recently, we secured a new project for a special, very high current, 24,000 Amp, Water Cooled Inductor for the new Magnetics Research Laboratory at Florida State University.

MarEx: *EPD is a success story in the evolution of today's power systems for industry.*

What are your future goals for the company?

Janik: Currently, we are researching an expansion program that might include Switzerland, Brazil, Vietnam and Singapore. I am also working to turning EPD into a more vertical market oriented company. But, while staying focused on the energy industry, a sector that I have been committed to for over 22 years.

MarEx