Velan View

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Making it happen: China's Taishan project

Also:

A family of engineers at Hawkins-Hamilton

Wolfgang Maar's passion for knowledge and strategy

Deloro Stellite and Velan

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President's message:
A company on the grow

The 36" pressure seal gate valves that grace the cover of this issue of the *Velan View* and tower over Joe Calabrese, our Director of Sales for East Asia, are the largest pressure seal valves we have ever manufactured. In the last issue of the *Velan View*, we talked about Velan France's work to help fulfill some of the valve needs of the GEN3 EPR reactors at Taishan I and II in China. In this issue, interviews with Joe Calabrese as well as Stéphane Meunier, Manager of International Projects, shed light on the project management and cross-functional, cross-plant teamwork involved in Velan North America's supply of valves to the non-safety related conventional island of the plants.

Company growth

It's not unusual to hear companies celebrating their groundbreaking accomplishments. In this issue of the *Velan View*, we break ground literally and we have the shovels and the photos to prove it! We have been supplying our valves in India since the 1950s, most recently working with our agent S. Giridhar (Giri). With this new plant and office in Coimbatore, we'll strengthen our local presence and take advantage of the burgeoning Indian economy. We're proud to announce that Ramesh Babu has come on board to act as the Managing Director of this new entity: Velan Valves India.

On the management front, we've also seen some changes recently. We're happy to welcome Wolfgang Maar back to the Velan fold as Executive VP of International Sales and Overseas Operations. He's a very competent and determined individual, and we know he'll bring new ideas and positive change to our company in the coming years.

Our distributors speak

Of course our view of the market includes our larger community of distributors and end users and in this issue we're proud to talk about a few of them, including the three-generation success story that is Hawkins-Hamilton. David Williams, who is currently running the company, shares his story with us and stresses the personal ethics and corporate rules of conduct that have been the cornerstone of the company's longevity. We also talk with Art Matheson of Canada's Matheson Valves, who has been a part of the Velan distributor network for over a decade and was recently recognized by Velan with its Joe E. Casey Award.

Industry trends

In this issue, we've asked Rana Bose, our former Executive VP, Engineering, R&D, QA, and TPI who still acts as a consultant to Velan, to share his insights on the growing critical and supercritical power industry worldwide. In addition to being a technical expert, Rana is also a strong believer in Lean and Six Sigma and years ago he helped us get our Lean journey started. We will also explore some exciting R&D work that we are currently collaborating on with industry leader Deloro Stellite in the ever-evolving area of coatings.

I wish you happiness and success in all your endeavors, especially the ones involving Velan valves!

Tom Velan
President and CEO

China's Taishan project:

Velan teamwork at its best

In the last issue of the *Velan View*, we covered the extraordinary job that Velan France did in providing valves to the critical portions of the GEN3 pressurized water reactors at Taishan I and II in China. Velan was also responsible for supplying valves for the non-safety related conventional island of the plants.

What happened with that venture, which was tackled by Velan North America, is an excellent example of Velan's teamwork.

The job

Velan's role in the conventional island portion of Taishan involves supplying an order of almost $12 million in a wide variety of types and sizes of valves, including some highly engineered and unique ones. For example, the project includes a quantity of 16, 36" class 900 pressure seal parallel slide valves. These 36" valves are the largest pressure seal valves the company has ever produced.

The order also includes a large number of forged pressure seal valves in sizes up to 24" and pressure classes up to 1500. All these valves are one-piece forged

Stéphane Meunier, Velan's Manager of International Projects.

bodies that are forged in closed dies, which is unique in the valve industry and superior to castings in terms of quality and reliability. The remainder of the order includes a large quantity of motor- and air-operated valves plus swing check valves with hydraulic dampeners. This array and the fact the project is a nuclear plant offers a host of opportunities and challenges.

"As you can well imagine, the negotiations for any large contract associated with a nuclear power plant can be quite challenging—both technically and commercially," explains Joe Calabrese, who was recently promoted to Director of Sales for East Asia and secured the North American side of the Taishan contract.

"After a lengthy negotiation and clarification period, we were asked to submit our final proposal and then wait for what seemed to be an infinite period of time. Once the waiting is over, however, there is a definite moment of joy when you're notified that you are the successful vendor," Joe explains. He adds that it's one of the reasons he went from project work when he joined the company in 1994 into applications engineering, which called for closer contact with the field, and then into marketing and project sales, where he has direct interaction with clients. "It's combining your technical background, which is crucial in our world, with relationship building and social skills," he explains.

While the high of a successful negotiation is powerful, Joe cautions that it's only step one in a lengthy process. "You're excited—how could you not be—since you just got the job you spent so many months pursuing. But you also realize that now the REAL work begins," he says.

"The detailed engineering work needs to start in earnest, and supply chain issues need to be resolved. You have to generate loads of engineering documentation, and production has to figure out how they are going to put all aspects together while trying to meet some very tight delivery schedules," Joe explains. "It really cannot be done right without a focused team of experienced people," he adds.

Joe Calabrese, Velan's Director of Sales for East Asia.

Kicking off a cross-plant project

Heading up the team for Taishan's Conventional Island is project manager Stéphane Meunier, who was recently promoted to Manager of International Projects.

"This client was very insistent that we have one person dedicated to managing the job because of the complexity of the order," Joe explains. "I had the lead on this project until the contract was awarded and then passed the baton to Stéphane—though of course to ensure continuity I stayed on top of the project from a high level."

Stéphane explains that: "We had to review customer requirements on an item-by-item basis just to make sure we'd narrowed down exactly what we were going to build. Those kinds of details need to be finalized at the early stages of a project so that when manufacturing did start, most of the kinks would already be ironed out."

> ***"As you can well imagine, the negotiations for any large contract associated with a nuclear power plant can be quite challenging—both technically and commercially."***
>
> **—Joe Calabrese**

Having a project manager was also crucial because, "This project was large and complex in all respects including dollar value, size of the valves, technical requirements, and documentation submittals. We couldn't accomplish any of it without a tremendous amount of coordination within Velan," Stéphane says. "It's certainly the largest project I've ever been involved with," he adds.

Part of the team that helped produce the giant 36" class 900 pressure seal valves: Jacques Bellerose (left), Production Foreman; Lester Wozniak (center), QC Manager; and Claude Rivard (right), Assembly Foreman, Production.

"The Taishan project has touched just about every corner of Velan. All five of our North American plants have been involved to some extent, as well as most areas of work; everything from production within each plant to QA/QC to engineering and sales administration," Stéphane explains.

"The Taishan order could not have been fulfilled without each one of those people—no one was more important than anyone else," Stéphane insists.

The challenges of the project

A project with the scope of Taishan carries a set of challenges that are both broad and wide reaching. They include considerations from how to transport the really large pressure seal valves to the huge amount of paperwork that's required to deal with the Chinese nuclear market.

"If we're going to handle projects of this size and reach, it is essential that we use the best ways to bring everyone in the team on board and keep them all up to date on the rate of progress," Stéphane explains.

Supply chain demands

The next biggest challenge was dealing with the supply chain, he says.

"You can never fully control all the factors in a project; especially one with so many special materials and difficult processes. We encountered some delays at the supplier level that could not be avoided. That's just the nature of the business with regards to global cycles and material availability," Stéphane says. The lesson learned was: "We need to build in more conservative buffers on future projects," he adds.

The Taishan project also involved working in materials with their own sets of challenges such as F22/WC9 and F91/C12A. Velan offers the forged equivalents to the greatest extent possible since they offer a higher degree of quality and reliability. These materials also require special welding and heat-treating processes.

Velan's long history of supplying valves made in these materials was crucial to the company winning the contract. "We had to figure out how best to work them through the supply chain," Stéphane explains. One of the ways that was accomplished was to split the order between various vendors so that

each supplier could focus on their area of expertise and the team could minimize the risk by not overloading any one supplier.

Working with different cultures

For Stéphane personally, one of the challenges was adapting to this particular Chinese customer's way of doing business.

"I learned how important it was to document everything and to resolve potential problems right away. The Taishan CEPR is the first of its kind in China and so the customer's employees are also learning and gaining experience as they go along. In addition to cultural differences, all of the project specifications are in English, and the customer is naturally cautious about doing things strictly by the book," Stéphane says. However, he had a lot of help in adapting to the new culture—Joe has been dealing with Asia for considerably longer than the five years Stéphane has been involved with that area of the world.

"We review the project on a weekly basis, whether it's a little issue that comes up or something that's major," Stéphane says.

As with every aspect of this project, communication is key, both with the client and inside Velan.

"I got Taishan going with a kick-off meeting in each of the plants to identify the project specifics and ensure the project got the focus it required from all involved. And the back and forth has continued to play a crucial role in our success," he said.

One of the points Stéphane and Joe have stressed from the very beginning within Velan is how important the project can be for future business.

As Joe explains: "There was a definite slowdown in new nuclear projects following the Fukushima incident, but there is clear indication that it's about to restart, not only in China but also in other parts of the world. With the current project, we've shown the customer and the rest of the world that Velan has the depth of knowledge and expertise needed to tackle these types of very demanding and large projects." **|V V|**

The challenges of working with really large valves

Taishan provided Velan plant personnel with additional lessons in how to deal with the increasing sizes of valves. "This is a big order and it also includes some pretty huge valves," says Chuck Doucet, who continues to work in Velan's Plant 2 as a consultant, having retired recently from his position as Production Manager. He is justifiably proud of the work the team in Plant 2 did in manufacturing these very large valves, assembling and testing them, and finally shipping them out of the door and to the client in China. "For these 36" class 900 pressure seal parallel slide valves, each body weighed in at 16,000 lbs; fully assembled, each weighed over 14 tons," says Chuck.

"The body was machined on one of our large CNC boring mills and counterweights were installed on the bottom of the body to equalize the weight of the top of the body. Basically, it was a balancing act: We had to do this so we could safely rotate the body with the large positioner while the seat was being welded inside the body. The counter weight itself was 7,090 lbs and was 45" long: It was one big chunk of heavy metal," Chuck adds.

"Even painting the valves was a challenge," Real Goyette, current Production Manager in the plant, adds. "Each valve stood just under 20' tall—and there were seven of them that came through this plant at once: The other nine in the order are scheduled to go out the doors during the first half of this year. We had to have the motors removed so each valve could fit in the paint booth, which is not a small space." Yvon Castonguay, General Manager of Plant 2, says, "Frankly, no one in Plant 2 had ever seen disc carriers and bonnets anywhere close to the sizes of these parts, and we've manufactured and assembled some seriously large valves over the years."

"Once the valves were assembled, two 10-ton overhead cranes moved each valve from assembly to our hydro test area," Chuck adds. "And as you can imagine, a sizeable lift truck was also required to move the valve to the large paint booth. Luckily, the painting and shipping areas are equipped with a 27.5-ton crane for handling this type of large valve. Bottom line is that it took a lot of hard work and dedication from the team, and they definitely came through on the project to ensure it was successful," he concludes.

Yvon Castonguay (left), Velan's General Manager of Plant 2, and Chuck Doucet, former Production Manager and current consultant to Velan.

Wolfgang Maar

Passionate about knowledge and a well-defined strategy

When Wolfgang Maar, Velan's new Executive VP of International Sales and Overseas Operations, graduated from college as a mechanical engineer, he had a choice of three different jobs. He took the lowest paid of the three, which was also the furthest away from his house. His reasons for doing so, however, illustrate very well what drives his professional life.

The first job offer, to work as an engineer in a government company, offered the highest salary of the three. However, "I didn't feel like they knew what they wanted to do with me and, as a result, I didn't feel I'd be learning anything." He then talked to a pulp and paper company about a job in a maintenance department, but it did not offer the kind of mental stimulation he desired: He wanted to learn how things work, not how they are fixed in a troubleshooting environment.

He went with a company that offered him an applications engineering job because: "I saw a job that let me interact with customers and work on solutions using what I learned. I have always seen myself in the business world as driving relations with customers, signing big deals but also having operational responsibilities," he explains.

From that first job, he went on to have a career that has spanned more than 25 years and been largely in the industrial world, with sales and marketing as one of his main responsibilities. But he has never strayed far from the operational side (how things work), adding to his knowledge in 2003 when he received his MBA in finance, then expanding his geographic know-how as he was put in charge of several global divisions. Along the way, he has remained driven largely by his desire to learn.

Soaking up knowledge

One of the sources of that learning has been mentors, Wolfgang says. For example, during his first job, which was as sales director for a valve company based in Germany, the company went through a shake-up period. A manager from the U.S. was sent over to the head office to show the European operation how things are done in North America.

"His ideas were radical. We had been managing in a traditional European way and everything this guy did changed the way we operated," Wolfgang explains.

However, Wolfgang very much liked what he saw, and "I started to learn as much as I could from him. We became quite good friends," he explains, and the two still touch base several times a year.

Wolfgang, who recently returned to Velan (he served as president of Velan GmbH from 1999 to 2008), came to the U.S. via a global sales position for a valve company based in Houston. "My first position based in the U.S. solidified for me how the American business environment works. It's very different being based here versus working for Americans while headquartered abroad," he explains. One of the most important lessons he is bringing with him from that job, however, involves how to run a truly Lean operation, he says.

"My former employer had an extensive program that truly was comprehensive in its approach. I really experienced what Lean means. We have a lot of Lean initiatives here at Velan, and I intend to work closely with Stephen Cherlet, Velan's COO, in helping further implement TPI (Total Process Improvement)," he says.

What Wolfgang brings to Velan

As the person in charge of international sales and operations, Wolfgang is the chief face representing Velan's international sales force as well as the person in charge of seeing that operations overseas run smoothly.

He says what he brings to the company are his extensive knowledge of the global marketplace and how to do business in different places around the world—how to establish relationships with key customers based on the business culture of their markets.

As far as sales: "We are aiming at the global market. We are doing well in East Asia, and we need to make sure we continue on our current path. As far as potential to expand, we see the Vietnam and the Korean EPC (engineering, procurement, and construction) market as budding markets, and we need to have a clear and comprehensive market strategy/business plan to understand the demand for each user industry: the competition, the market prices, what channels are available and what resources are required," Wolfgang comments.

This comprehensive, highly strategic approach is the cornerstone of Wolfgang's operational approach and his future plans for the company.

"In terms of how I plan to move forward, we will be analyzing the whole sales process, identifying our gaps, and working with our teams on improvements," he explains, with the goal of developing global project coordination.

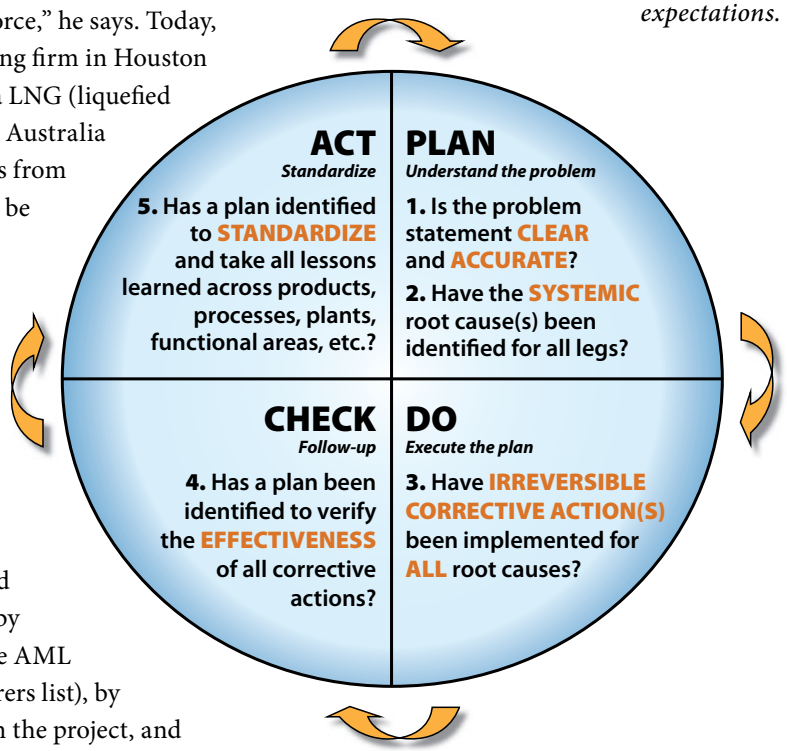
"In the old days, if you had a refinery project or investment in Houston, the EPC was in Houston, distributors were in Houston, and so was the sales force," he says. Today, however, an engineering firm in Houston might be involved in a LNG (liquefied natural gas) project in Australia supported by investors from London. However, "to be successful, you need to know all three parties and how they interact with one another. This means our global sales force needs to get involved very early in the process so they can influence specifications and increase our hit rates by knowing we are on the AML (approved manufacturers list), by knowing key people in the project, and by knowing how our product will fit into the picture," he explains.

> ***"A problem well stated is a problem half solved."***
> **—Charles F. Kettering**

Running a global operation

Formulating a realizable and comprehensive strategy is also the cornerstone for Wolfgang's plans for global operations. He is a proponent of Hoshin Kanri, which is a tool for implementing a company's vision based on individuals pinpointing their own responsibilities and strengths/weaknesses, putting specific actions into a plan, and then putting in place a process that allows them to continually act on that plan. It is based on the assumption that each person is the expert in his or her own job and uses the collective thinking power of all employees to make their organization the best in its field.

Plan–do–check–act cycle (below)
The basis of such a process is accountability: making sure people know what is expected of them and then seeing that they fulfill those expectations.



Hoshin Kanri insists that everyone in the team be focused on a shared goal that is clearly communicated to them, and that each of them is fully accountable for planning and achieving their part of the plan. As Professor Kaoru Ishikawa, the originator of the process, remarked: "Top managers and middle managers must be bold enough to delegate as much authority as possible. That is the way to establish respect for humanity as your management philosophy."

Wolfgang explains that, "Basically, instead of presenting your ideas and what you intend to do in a PowerPoint and then walking out of the presentation without follow up, you are giving people a specific plan linked to their own functions within the company so they know exactly the targets they need to hit. The Hoshin Kanri planning system includes the implementation, or the doing, of what is planned, and the subsequent review of what is done. Consequently, the entire process is a 'closed loop' where corrective actions can be planned based on the outcomes."

That method starts with identifying and pinpointing roles. "In meetings sometimes, I'll ask the question: So who owns this?" he says. In other words, when some event occurs or something is being proposed, who is the person who will ultimately get it done or be in its way if it is NOT done.

By approaching it from this angle, "instead of having 10 people sitting around arguing about approving something, one person knows he or she is ultimately responsible and just does it," he explains.

The leadership style

Wolfgang says his leadership style is to be as honest as possible with people, both positively and negatively. He believes in getting peoples' input and then setting realistic expectations based on that input. And he expects people to live up to those expectations. "People working with me do not need to worry what I will think about their performance as I will let them know, " he adds.

"At the beginning, some might find me reserved in meetings. But what I'm doing is listening to what people are saying, what they suggest, and looking at the team dynamics. If the team seems to find its way on its own, it will rarely hear my input. If, however, it needs an additional lead, I step in and direct the team members by asking questions that will help guide them toward finding a solution," he says.

Wolfgang and his wife Angela hit the road.

Communication is key and Wolfgang works hard to ensure that people understand what he expects and that he is consistent in the messages he presents. He also strongly believes that during meetings all participants should be encouraged to give their input without fear of saying something wrong, since what might seem off to one participant might in the end lead to the optimal solution. Questions and serious attempts at problem resolution are always welcome in Wolfgang's meetings because "we all need to realize that our success is built on team effort, on teamwork. We need to make every day's work flow efficiently by dividing the process into separate functions (such as production, sales, order entry), just as we need to effectively communicate and operate our cross-functional processes toward becoming an even more successful company," he adds.

The personal side

Wolfgang says he's finding the differences between European business expectations and U.S. business operations an interesting exercise in cultural differences.

"I can't yet comment on Canada; after less than a year here I have barely seen more than an airport, the office, and my home. But in Texas, I found a big difference between their culture and the German culture I'm more accustomed to. People in Germany tend to keep more to themselves; they're not quick to establish relationships and connect with other people. In Houston, you cannot escape the connectivity," he says. "Everyone is so outgoing and friendly, and it's a warm, open place to live and work."

One other aspect of his time in Texas that Wolfgang deeply enjoyed, given that one of his passions is motorcycling, were the state's wide open spaces.

"I have had a motorcycle since I was eight years old and I still love them. My current-motorcycle is a bit more extreme than your average bike. Engine-wise it's the biggest motorcycle you can buy in the world: It's a Triumph with a 2.3-liter engine. It's pretty fast off the mark."

Since he has a family to think of (his two sons Michael and Kevin are eight and eleven), Wolfgang admits he's thought twice over the years about selling the motorcycle and buying a motor boat or something more family friendly. However Angela, his wife, would not be in favor.

"She likes the motorcycle as much as I do. She won't let me get rid of it," he adds. **|V V|**

Besides motorcycling, Wolfgang Maar enjoys some other not-so-tame activities. He is both a snow skier/snowboard enthusiast and a waterski/watersport lover. He also likes to cook, though his schedule doesn't allow that to happen often.

But if you ask him to label himself, he sums it up with: "My place is at home."

His days begin at 5 a.m. with his wife Angela, who goes to the gym with him to have some alone time without their children. And while he sometimes brings work home at night or on the weekends, home is where he wants to be.

"I know a lot of colleagues go out at night with their friends. I like to get to know my co-workers, but you won't find me often going out for a beer after work. I might be in a corner at home doing some work, but at least I'm home with my family," he says.

Planting our feet

in India's fertile soil

India is now the second-largest country in world by population (behind China), and the most populous democracy in the world. The country is known for turning out top-notch engineering experts, and much of the rest of the world now relies on the rich labor force of India for international operations.

Saarymathy Bhagatsingh (front left), Senior Enterprise Applications Support Associate, Velan Valves India, with Sabine Bruckert (front right), VP of Human Resources and General Counsel, Velan, attended the groundbreaking ceremonies.

Because it is an emerging nation with tremendous energy and infrastructure needs, Velan has been doing business there for many years—it is the third largest export market for Velan products. But 2012 will see a significant milestone for Velan in India: The company is building its first manufacturing plant in Coimbatore, which is in the extreme southwest of the Indian subcontinent and in the province of Tamil Nadu. Velan Valves India broke ground late in 2011 and the building will be completed this year.

As far as why that location was chosen: "Many of India's valve manufacturers, machine shops, and forging and casting suppliers are located in Tamil Nadu province so it is a good place to find experienced people and suppliers," Tom Velan, President and CEO of Velan, explains.

"What we found is that people are not very mobile in India. There are many different languages and cultures in the country itself, but for the most part, the work force tends to stay in one province. It just made sense that our first manufacturing facility would be in the place where much of the work is already going on," he adds.

As far as end-user industries in India, Tom explains that the power and oil and gas industries are the main targets for Velan Valves India's products.

"The need for all forms of energy is huge in India. They have a growing middle class, a growing population, abounding commercial enterprises and a huge need for infrastructure improvements, all of which need more and better access to power," Tom explains. "At present, there is a lack of adequate power supplies and most businesses need their own generators to deal with power shortages. There is also more and more localization in the country. We needed to be in the market in a stronger way while lowering overall costs of production."

Velan Valves India will be producing small forged valves for the export market to begin with. The company will also expand into niche products that cater specifically to the Indian power market.

Heading up the effort is Ramesh Babu, who was named Managing Director, Velan Valves India, after an extensive hunt by Velan.

"We already had a very strong sales force in India, but needed to find the right person for running the new operation. Our own former Executive VP, Engineering, R&D, QA, and TPI, Rana Bose, agreed to work as a consultant on this project for us and interviewed extensively in a search for someone who had already proven themselves and understood concepts such as Lean," Tom explains.

Ramesh brought to the table over 20 years of experience in the valve industry as well as extensive knowledge of manufacturing operations.

Ramesh says that he didn't get his start with valves, though. "After getting an engineering degree in 1987, I started out making motorcycle cases," Ramesh explains. However, after a short time he was hired by a valve manufacturer and began running their

"If I had to put what I believe into percentages, I'd say 40% of running a good organization has to do with the people and their attitudes, and 40% has to do with the systems you put in place. The other 20% is what you actually put there—the machinery and manufacturing process."

—Ramesh Babu

Ramesh Babu, Managing Director, Velan Valves India.

machine shops. He worked for them for the next 10 years, learning the business from the ground up, but also planning for his own steps forward in the field. In 2000, he got a big break when he was hired to set up a new valve-making facility, and then to run that facility—his first job wearing the manager's hat instead of running the production lines.

"In 2001, after 9/11 happened and some companies pulled back, the company I worked for decided to close shop in India," he explains. However, his original employer hired him back, and by this time he was firmly entrenched in management. He served the next 10 years in progressively higher levels within the company. By the time Velan hired him, he was an assistant VP of operations and had received his black belt in Lean as well as a masters in business management.

Architect's drawing of Velan Valves India's new plant.

"We were looking to start this plant's management team with someone who already had extensive management and production experience in the valve industry, so we hired Ramesh," Tom explains.

The team leader's thoughts

Ramesh is now in the process of putting the rest of the India team together, relying heavily on Rana and on S. Giridhar (Giri), a key member of Velan's sales team who has been key in building up the business there. The first two legs of the team were information technology and engineering, which are already set up; the people who will run and work in the plants are being hired in the first quarter of the year.

Those who end up working with Ramesh will soon discover that he's very results-oriented.

"I believe in the theories that help the operations of a plant with direction and new ideas, and I refer often to what I've learned in my schooling and reading. But for me, execution is key," he says. "I am looking for the kind of people that have the attitude of making things happen," he explains.

"If I had to put what I believe into percentages, I'd say 40% of running a good organization has to do with the people and their attitudes, and 40% has to do with the systems you put in place. The other 20% is what you actually put there—the machinery and manufacturing process. We are already using a proven technology to make the high-quality valves expected of Velan. So we need the systems in place, and the people to run them," he says.

The plant also needs accountability. "Information and input mean everything in running a manufacturing plant. I rely on data to make meaningful decisions. We can talk about plans as much as we want, but those plans must be substantiated with facts and figures," he says.

The products themselves also need the right sales team in place. Fortunately for Velan Valves India, that part of the team was already in place through Giri, a market veteran and the face of Velan in India. Giri started selling Velan valves in India in 1996 and has never looked back. He has been very successful in putting together a highly motivated team focused on providing solutions to the customer and being there when the customer needs them. "We have a great sales team with all the specific skill sets that are required to promote the broad range of the Velan product line—be it manual, motorized, or control valves. The team has always been ready to take on the various challenges of order execution, including trouble shooting and service-related issues," Giri explains.

"For me, Giri is the head of marketing and sales in Velan Valves India," Ramesh adds. "He is the one who will spearhead our sales organization and lead it to greater heights.

"Although the company hasn't had a physical presence in the country until this plant, Velan is well known for its tagline of 'Quality that lasts.' What our new plant has to do first is to live up to that tagline. If we do that, the market share will follow," Ramesh concludes. **|V V|**

"We have a great sales team with all the specific skill sets that are required to promote the broad range of the Velan product line—be it manual, motorized, or control valves. The team has always been ready to take on the various challenges of order execution, including trouble shooting and service-related issues."

—S. Giridhar (Giri)

Velan Valves India's sales team (left to right): M. Jayanthan and Vinod Daftari, Regional Sales Managers; Shankar Shome, National Sales Manager; Ramesh Babu, Managing Director; S. Giridhar (Giri), Givina Consultants; and Arun Dhingra, National Sales Manager.

Bhoomi-Puja (groundbreaking) ceremony

The groundbreaking team (left to right): S. Kulothungan, Design Manager, Velan Valves India; S. Giridhar (Giri), Givina Consultants; Sabine Bruckert, VP of Human Resources and General Counsel, Velan; K.P. Prasannakumar, Velan Sourcing Representative; Sriram Natarajan, Managing Director, Circor (who are currently building a facility on the adjoining lot); S. Venkatraman, Wealthtree Advisors; Ramesh Babu, Managing Director, Velan Valves India; George Zarifah, VP, Global Capital Investment and Production Technology, Velan; and Rana Bose, consultant.

George Zarifah (front left), VP, Global Capital Investment and Production Technology, Velan, with Ramesh Babu, Managing Director, Velan Valves India. Deepak Narayanan (back left), Wealthtree Advisors, and S. Kulothungan, Design Manager, Velan Valves India.

Groundbreaking ceremonies are traditional in many cultures worldwide and are held to celebrate the first day of construction for a building or other project.

Velan recently held such a celebration for the opening of the new Velan India plant in Coimbatore, India. The ceremony took place October 28. "We laid the foundations for this eagerly awaited venture and very appropriately the rain gods cleared the skies and paved the way for a wonderful and colorful opening ceremony," said Ramesh Babu, Managing Director, Velan Valves India.

"The Velan India team is all geared up to move on to the construction phase and get cracking," Ramesh stated.

As is the traditional practice in India, priests chanted ancient blessings, and fruits and herbs were presented as offerings. The entire team also joined in prayer for the well-being and safety of all the personnel who will be involved in building the new entity. Finally, a tree was put on the site specifically to create a sense of ownership and celebration and to honor visiting dignitaries.

Coimbatore, Tamil Nadu province, India.

Construction of the new plant began shortly after the groundbreaking ceremonies.

Matheson Valves

Focus and integrity make a good sales foundation

Art Matheson, President of Matheson Valves.

Before Matheson Valves caught Velan's eye, Velan worked with a large local distributor that handled valves as well as plumbing and electrical equipment. Consequently, Velan valves were sometimes lost in the mix.

"That's why we decided to go with a smaller operation that was more valve focused," Paul Dion, VP of Sales, Canada, explains. "We found that with Matheson, which is totally focused on valves and the process industries," he adds. "The fact that every single person in the company is familiar with the technologies and our particular products is a huge attraction for us."

The success Matheson has had with that business model in the 11 years the two companies have worked together won the firm the Joe E. Casey Award at last fall's biannual Velan Sales Conference. "The Award is given to organizations who have achieved a long-term successful business relationship with Velan, which certainly applies to Matheson Valves," Paul says.

> ***"Matheson is all about valves and the process industries."***
>
> **—Paul Dion, VP of Sales, Canada**

Matheson was the recipient of the 2011 Joe E. Casey Award. Here Joe Rainelli (left), Strategic Account Manager, and Art Matheson, President of Matheson Valves, stand by the award.

A family affair

Velan and Matheson originally connected through Art and Paul.

"I actually knew Paul when he was working for another valve manufacturer. When he joined Velan, he convinced me of the possibilities that a match between our companies would present," Art says.

However, while the relationship with Velan is now over a decade old, the company itself has been around much longer. Art started the business in 1981, after several years as a sales manager with another distribution firm. He studied engineering in school, but became involved in sales "because it's in my own personal makeup. I have always known that understanding the technology is crucial in manufacturing and that the technology changes dramatically so you have to keep up with it and stay ahead of the curve. But it's more in my personality to be the one making the deals than to actually work on making the product," Art says.

"I have always known that understanding the technology is crucial in manufacturing and that the technology changes dramatically so you have to keep up with it and stay ahead of the curve."

—Art Matheson

Art Matheson, President of the company, explains why the relationship works so well.

"For Velan, we have brought new avenues for products—new places where Velan wasn't selling before. For us, having the Velan line has expanded our customer base, as well as our reputation for excellence," he says.

Art Matheson showcasing an order of Velan valves in stock.

Over the years, the company grew, as did Art's family. In the beginning his wife, Edrina, was both order desk and accountant and is now in administration with her own accounting staff. Although both sons are university graduates, they began their careers in the warehouse working their way up to managerial positions. "This is a philosophy we believe in, and we apply it to our inside and outside sales force," says Art. Son Todd is now their IT manager and also works closely with the outside sales force on major projects. Son Troy now runs the Ontario operation and is involved in both sales and administration.

The rule from day one has been that regardless of the fact that much of the family works in the business, work discussions are usually left at the company door.

"Early on, when family began to get involved, we decided we needed to make weekends and evenings our family time, not company time. There are exceptions to the rule when a hot issue is happening over the weekend that needs an immediate solution but, for the most part, we keep business at work," Art says.

Art Matheson with his wife Edrina out on the town.

The dynamic duo: Art Matheson (seated) and his key Velan contact, Paul Dion, VP of Sales, Canada.

Meanwhile, the company itself has grown from a "ma and pa" organization to an employer of 27 people and annual sales of $20 million. But while the business would now be called "medium-sized," the company has maintained its original business model: This was to expand not through offering more and more products, but by focusing its efforts and resources on providing quality valves to specific markets and building up its reputation as a dependable, high-service company.

"Excellence is our priority in dealing with customers. We want to solve problems for them, not sell them more metal," Art says.

Art calls what Matheson provides "frame agreements," explaining that: "We are successful at setting up the whole package for major valve users. We sell them all the valves they need from A to Z. Those products are not all the same brand or types, but they are the very best valves for that particular application," he adds.

The company has also been successful at working in partnership with some of the best engineering firms, which has expanded its reach across international borders.

"While most of our business is done in Ontario and Quebec, we team with the best Canadian engineers—supplying valves for systems around the world," he explains. In that way, "we are exporting Canadian technology to countries all over the world. We're proud to be able to do that."

"Excellence is our priority in dealing with customers. We want to solve problems for them, not sell them more metal."

—Art Matheson

"We are constantly regenerating ourselves, learning new ways of doing things, and keeping a sharp eye on the marketplace to see what new products are coming out."

—Art Matheson

Paul agrees that the ability to team up with good companies is why Matheson is so successful.

"Despite the fact Matheson is in direct competition with some very large corporations, the company thrives and has a very loyal customer base. That's why Matheson received this year's Joe Casey award. Its employees know their territory, they provide excellent customer service, and they keep their clients for a long time," he adds. "They know what they're doing and they do it very, very well."

The "family" growth

Although the Matheson name is the recognizable brand behind the company, the corporate brainpower happily extends beyond just the immediate family.

"While we may not be back in the days when everything was done with a handshake, the business still comes down to having the right people in place—those who know the technology behind the product and have integrity when dealing with customers," he said. In other words: "The most important ingredient in this business of offering solutions to clients is our own people, our own staff," he added. "I know that's a cliché, but it's true. We know the values we want to embody as a company, and we try to ensure those values are reflected in everyone who represents us."

Those who know Art know him as an active proponent of physical fitness. In fact, he's an ex-football player and, as a self-described ex-jock, he spends time with his wife in pursuit of activities such as cross country skiing during the winter and, during more clement seasons, engages in his real passions—golfing and fishing. Not surprisingly then, Art likens running the business to coaching a sports team.

"We've been very fortunate in hiring the best people, the majority being long-term employees, and we've also challenged them to be the best they can be. Hopefully by continually investing in training courses offered by our suppliers, we have given them the means to do that," Art says. "Part of this means that you can't just talk the talk, you also have to lead by example and walk the walk. And I think we do that."

That means that any individual calling on an account must be completely familiar with the process for which he or she is about to offer a solution.

"The salesperson has to understand whatever problems or challenges the user has to be able to offer the best solutions," he says.

As a company, that means "we are constantly regenerating ourselves, learning new ways of doing things, and keeping a sharp eye on the marketplace to see what new products are coming out," he says.

Celebrating the catch of the day.

Integrity beyond company walls

For Art Matheson, the pursuit of doing the right thing is not restricted to business hours. He's also a strong proponent of giving back in all aspects of life.

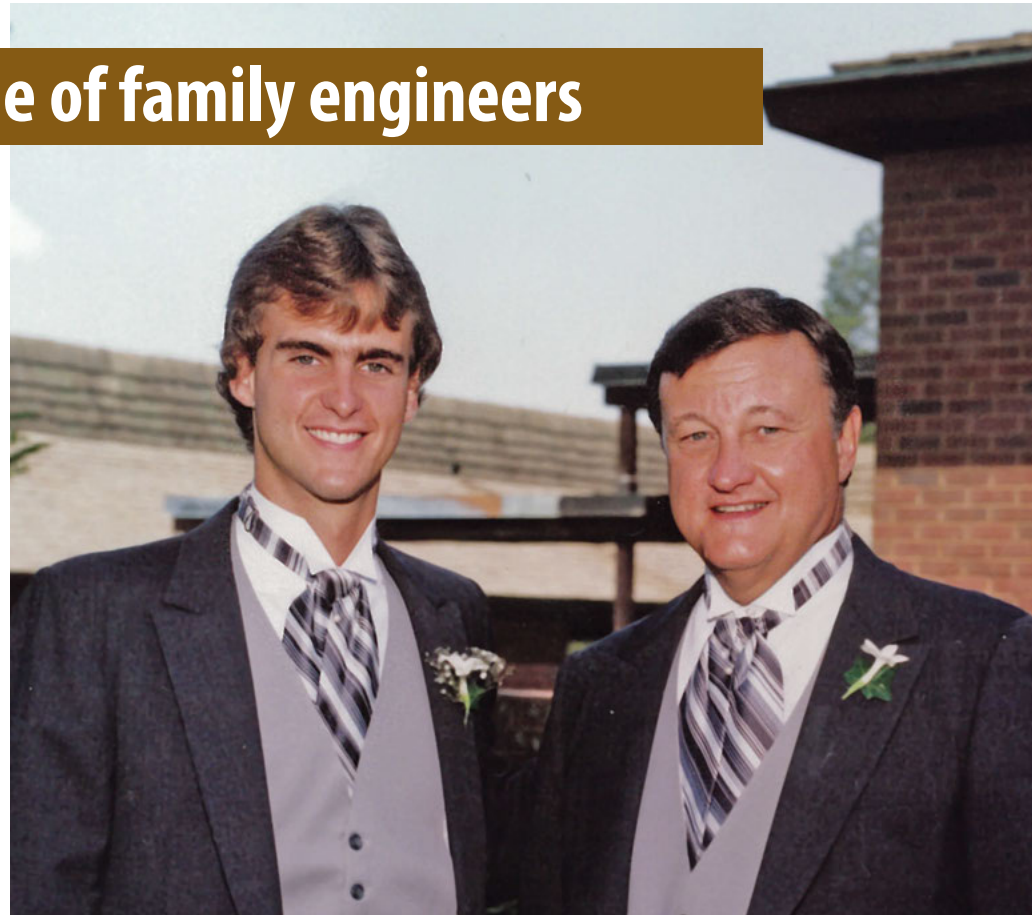
"My wife and I consider ourselves to be very fortunate in what we've been given in life. As we mature, we're getting more and more involved in giving something back to society. We're still active in business, so much of the support is financial since we don't have a lot of free time. But we hope to be able to be more active in later years," he says. The Mathesons lend their support to a number of organizations including a local veterans' hospital, local palliative care, the Royal Victorian Order of Nurses, and a school breakfast program for underprivileged children.

"There are so many ways that you can give—from something as simple as serving in a soup kitchen to giving financial aid to organizations in need. We just feel like people today take a lot out of society, and there comes a time when you have to give back," he says. **|VV|**

Hawkins-Hamilton:

Continuing the line of family engineers

The first generation: Harvey Williams, Jr.



The third and second generations: David Williams with his father, Harvey Williams III.

Someone looking at Hawkins-Hamilton's long history through a long-distance lens might assume that the three generations of Williams men who have been at the helm for the last 60 years mapped out a succession plan for the company from day one. What that lens doesn't reveal is the remarkably good timing that occurred as the company passed hands from grandfather to father to current owner and President, David Williams.

"I am proud to work in a family organization, and part of the reason Hawkins-Hamilton has had such as good relationship with Velan is that family connection," David explains. The company, which is based in Richmond, Virginia, has been a sales agent in the south—mostly Virginia and the Carolinas—for Velan for 57 years, the longest such relationship Velan has developed.

But even though both companies are strongly family based: "Neither my father nor I was encouraged to come into the company right out of school," David explains. "Our fathers wanted us to feel free to pursue our own dreams, but in the end both of us ended up back here at Hawkins-Hamilton," he adds.

How it happened

As a company, Hawkins-Hamilton actually dates back to before any of the Williams clan was on site. The company was founded as a manufacturers' representative to the power generation and municipal markets. Two engineers—Mr. Hawkins and Mr. Hamilton—started the company in 1914 after graduating from Virginia Polytechnic Institute and State University (Virginia Tech).

David's grandfather, Harvey Williams Jr., came on board right after the Depression in 1940. He worked his way up and eventually bought the company from its owners. Meanwhile, Harvey Williams III, David's father, graduated with an engineering degree (also from Virginia Tech) and then went to work for a paper manufacturer.

Hawkins-Hamilton is one of the very few Velan agents or distributors to win the Velan Joe Casey Award twice.

The first time David's dad approached his own father about working for Hawkins Hamilton there were no slots open so grandad had to say no.

"When you have a small business like ours and are seeking to be a sales engineer, there are no entry-level positions—someone has to leave for a job to open up," David explains.

"When you look at Hawkins-Hamilton, it's truly remarkable how smoothly the Williams have been able to move ownership down through the three generations. That's not an easy thing to do, and they've done it very, very well, keeping strong relationships with Velan through the process and also with their end customers."

—Paul Lee, Velan's VP of Sales–United States, Eastern Division

Eventually though, a position opened up because of a retirement, and David's dad joined Hawkins-Hamilton in 1968. In 1976, Harvey Williams III took over the helm of the company and established a plan to buy the outstanding Hawkins-Hamilton stock from his father's estate.

Like father like son

So where does the element of good timing come in to play? Consider that a generation later, history literally repeated itself. David Williams received an undergraduate degree in industrial engineering and a graduate degree in mechanical engineering from Virginia Tech. After school, he took a job with a manufacturer of gas turbine engines, but decided after 18 months that his interests lay elsewhere, and he preferred to work for the family company.

"I have always been fascinated with the field of power generation, and I had an interest in technical sales," he explains. "But I was told the same thing by my father that my grandfather had to tell him: We can't afford to support another sales engineer right away," David says.

He was slightly luckier in timing than his dad, however, since he asked to come on board in December 1988 and, in January 1989, one of Hawkins Hamilton's sales engineers left the company, and a spot opened up. David went to work in the family business and almost 10 years later, in 1998, David and his father started a five-year phase-out/buy-out process. In 2003, David became owner of the company himself—and the third generation of Williams' family leadership began.

Company milestones and the Velan relationship

Although Hawkins-Hamilton is still in the basic business it began in 1914—power generation—the field itself has changed tremendously over the years. Happily, the company has been able to change with it and take advantage of ever-evolving market opportunities. For example, when nuclear power entered the picture in the 1960s, Hawkins-Hamilton was at the forefront. One of its major clients became a manufacturer of nuclear reactors, another was a shipbuilder that eventually contracted with the U.S. Navy on nuclear-powered ships, and a utility built four nuclear reactors in Virginia.

Interestingly, when Hawkins-Hamilton's shipbuilding client was designing the steam catapult launching system used on fossil aircraft carriers in the 1950s, they had a requirement for high-capacity steam traps.

"It was during that period that our relationship with Velan began. Our shipbuilding customer introduced A.K. to my grandfather and recommended that he be their sales rep for Velan steam traps," David says.

From that introduction, a relationship blossomed. "Our relationship with Hawkins-Hamilton and the U.S. Navy has been a highly collaborative one," says A.K. Velan. "Over the years; we've pioneered many valve technology innovations that have later become standards in a wide range of industries. For example, the Navy was quick to standardize on forged valves up to 24" because of their greater strength and reliability. These forged valves have since

found widespread preference in fossil power plants, commercial nuclear power plants, and in super-critical power plants in particular," A.K. concludes.

David adds that, "We had some good years during the first boom of the nuclear industry working with Velan, and we weathered the next phase of nuclear together—the decline in nuclear activity that occurred after the Three-Mile Island incident. Although there was a moratorium on new reactors, the nuclear plants in our territory still operated so we continued to support them with replacement valves and parts."

The most recent milestone in nuclear, however, promises to take both companies into a bright future. In the late 1990s and early 2000s, a new class of nuclear aircraft carrier was born: one that didn't rely as much on steam and condensate return systems but still required extreme durability and long life on all its valves and systems.

"The new Gerald Ford Class carrier is designed to last 50 years," David explains. "We talked with Velan's decision-makers, who were willing to dedicate the necessary engineering resources to go after as many of the valve development projects as we could get," he says. "Velan has the type of engineered, high-quality, reliable, and long-life products that were needed," he explains.

In the end, the transition to the new class of aircraft carrier has resulted in Hawkins-Hamilton "doubling the sales of Velan valves on an aircraft carrier," David adds. "What's more, unless we run into federal budget constraints, I see the Ford Class of ships being built for the next half century," he explains. Going forward, David anticipates the nuclear renaissance and the next generation of nuclear reactors for power generation.

"Although some of the activity was slowed slightly because of the incident in Japan as well as a more recent earthquake here in Virginia, I believe nuclear power will eventually be a key part of power generation in the U.S.," David says.

The strengths of the relationship

David says that he believes one of the many strengths of Hawkins-Hamilton, as well as his own personal strength, is having an engineering background.

"We were founded by engineers and our owners have all been engineers. That kind of expertise is a great advantage in technical sales," David says.

The other strength is an awareness of customer needs.

"Being a good sales agent requires knowing what the client needs as well as what the manufacturers' capabilities are—you have to be able to match up the two," he says.

That requires listening to both parties, and understanding that technology is a tool that can aid in running a business and communication, but is not a replacement for face-to-face contact and relationship building.

Paul Lee, Velan's VP of Sales–United States, Eastern Division, has known Hawkins-Hamilton for almost two decades.

"How many times today when you call a company do you get voice mail or an answering machine? When you call our office, you get a person and if that person can't help you, they'll find someone who can," David states.

Paul Lee, Velan's VP of Sales–United States, Eastern Division, has known Hawkins-Hamilton throughout his 19-year-long career with Velan. "When you look at Hawkins-Hamilton, it's truly remarkable how smoothly the Williams have been able to move ownership down through the three generations. That's not an easy thing to do, and they've done it very, very well, keeping strong relationships with Velan through the process and also with end customers.

"The other constant I've seen in all three generations is a strong sense of character and integrity. For example, when you meet with David you'll notice he conveys a sense of quiet, considered competence," Paul adds. "He's very down to earth, obviously knows his stuff, and has a real old-world gentility to him. You know he'll do whatever needs to be done to make things right on the job, no

Velan and Hawkins-Hamilton have worked together to equip the U.S. Navy with Velan valves and steam traps. This illustration of a next-generation USS Gerald R. Ford-class nuclear aircraft carrier by Newport News Shipbuilding is an example of one such collaborative project.

matter how challenging the criteria, down to the smallest detail."

As far as why the relationship with Velan has been so fruitful and long-standing, David points to three reasons:

Mutual respect: "The Velan family and organization and the Williams family and Hawkins-Hamilton organization have always understood one another's expertise and capabilities," David says.

Loyalty: "I was in a situation recently where one of the companies we represent asked me to expand my relationship with that company and sell a product that competed with Velan. I would not do it, and this company ended up cancelling our sales agreement," David gives as an example.

Communication: "With Velan, we have a strong tie and open lines of communication with upper management. We don't have the same relationship with some of the other companies we represent that started out small, but have since been acquired by larger companies," he says.

"I know that if I have a concern or need, I can go directly to management at Velan and they will listen. If they agree, they'll act. If they disagree, they'll discuss. That's huge in today's business world," David says. **|V V|**

Coming full circle

Like many seasoned couples, David and his wife Marnie have developed a number of interests they share—they are outdoor enthusiasts who love to ski and hike; they also have a strong interest in the history of the south, which manifests itself in the appreciation of antique southern decorative arts.

The two also share another passion, fueled by the Williams' family background and solidified recently by a return to the family roots: They both love family history and sense of place.

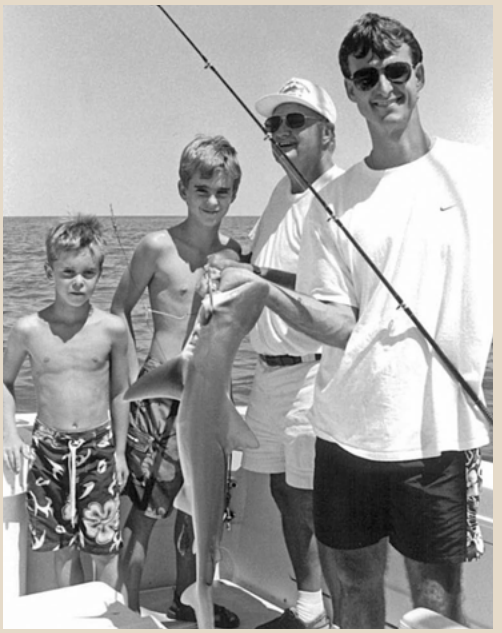
"I grew up spending my summers on the Chesapeake Bay in a family cottage in Mathews County. Many of my greatest family memories come from time spent there," David says.

"When my wife and I met in the early 1980s, she had never experienced the Chesapeake Bay, but she quickly caught the fever, and it's something we still share," he adds.

In 1990, his parents decided to retire on the Bay and, realizing they needed a house and not a summer retreat, sold the cottage.

"Three years ago, my wife and I decided we wanted a place in Mathews County, and we approached the people who bought our family cottage almost 20 years ago," David says. As it so happens, the people were willing and ready to sell, and now David has returned to his once-lost family summer home to create memories for his own young family.

David Williams with his wife, Marnie, hiking in the mountains of West Virginia.



Three generations of the Williams family: David's sons Matt and Drew (left) with their grandfather Harvey and their father.

A balance of hard work and play: David Williams hiking in Colorado.

Industry focus

Supercritical and ultra-supercritical power plants: An interview with Rana Bose

VV: What exactly does supercritical mean?

In order to understand a supercritical (SC) fluid, one must first understand the definition of a critical point. In thermodynamics and condensed matter physics, a critical point, also called a critical state, specifies the conditions (temperature, pressure, and chemical properties) at which a phase boundary (between gas and liquid) ceases to exist. In other words, the fluid is neither a gas nor a liquid, but a homogenous mix.

A supercritical fluid is any substance at a temperature and pressure above its critical point, where distinct liquid and gas phases do not exist. Water reaches this state at a pressure above 22.1 megapascals (MPa) or 221 bars at 374°C (3208 psi/705°F). At this point, the heat of vaporization becomes zero (no energy is required to go from liquid to the vapor phase) so the fluid is at a free state, so to speak, and its molecules can travel at high speeds and with high energy. Effectively, H_2O has more "oomph!" when it goes supercritical and thus provides more efficient energy transmission.

VV: What's the difference between supercritical and ultra-supercritical plants?

Typically, the supercritical range is between 245 bars (24.5 MPa or 3553 psi) and 285 bars (28.5 MPa or 4133 psi) and a corresponding temperature of 540°C (1004°F) to 580°C (1076°F). This is considered mature technology and there are many supercritical plants in operation and many planned.

There are materials available to meet these conditions. Thermodynamically speaking, there is no such thing as ultra-supercritical (USC) or advanced supercritical. These are expressions used by industry personnel to denote design conditions that are superior to the prevalent supercritical designs. Within the "ultra-supercritical" category there are plants operating at 280 bars (28 MPa or 4061 psi) and 600°C (1112°F), with specialty high-temperature, creep-resistant materials. And beyond that, R&D is going on for above 380 bars (38 MPa or 5511 psi) and 700°C (1292°F) temperatures using nickel alloys. The Electric Power Research Institute defines ultra-supercritical steam cycles as steam temperatures above 593°C (1100°F).

VV: What are the benefits of these plants?

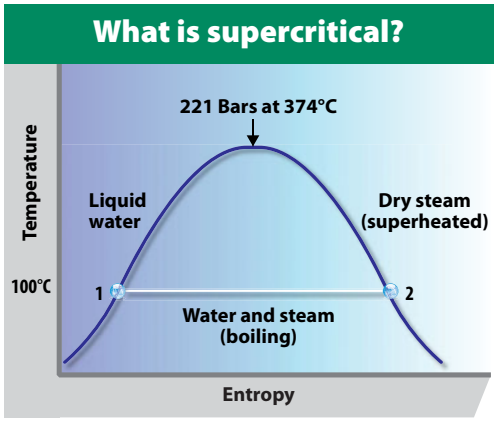
Needless to say, efficiency is the key element or driving force. For a kilogram of coal you get more electricity output—megawatts of power—at higher temperatures and pressures. Supercritical "water" has lowered density, which means it has more motility and it can transfer heat much more efficiently. Between a SC and a USC plant, the rate of heat output increase could bump up by 6% to 7%—which is significant! What is, however, more significant is that coal has always been considered "dirty." And it is absolutely true. But new advances in catalyst conversion technology, better NO_X and SO_X scrubbing technology, flue gas removal technology, and stringent carbon capture regulations make SC power plants

"Between India and China they are looking at some 900 plants in the next 20 years: So, do the math! This is a program that requires a strategic outlook, strategic deployment, and no small amount of determination. Valve companies who are serious about this market must have a clearly defined and designed supercritical line available. Velan is convinced about it."

—Rana Bose

an attractive argument, given that nuclear energy seems to have received a punch to the nose after the Fukushima incident. There are also claims that CO_2 emissions are reduced by about 15% per unit of electricity generated, when compared with typical existing sub-critical plants.

But I don't speak here only as a cut-and-dried engineer. In this context and from a larger socio-economic perspective, it is important that long-term environmental commitments are not diluted when proposing coal-fired plants. If you want to fire up coal, you must be responsible about emissions for the whole world and setting a good example



Typical Rankine cycle temperature-entropy curve. Described in 1859 by William Rankine, it is used as a standard for rating the performance of steam power plants.

is important for Canada as a country. There was an interesting article in the *NY Times* about China's ferocious utilization of coal, but the article also emphasizes that China is far ahead of the rest of the world, including the United States and Europe, in more efficient and less polluting use of coal-fired plants. Thus, there is a need for the developed countries not only to use advanced technology but also to stay committed to advanced emission controls in a principled way. The United States and some other countries lean more towards gasification of coal before it is used to make steam, which is a better practice than using pulverized coal.

VV: What can you tell us about the history of supercritical plants?

This is actually a difficult question to respond to. Supercritical power plants are closely tied to the advancement of high-temperature, creep-resistant materials and advanced boiler technology. Several attempts had been made in the past to create boilers in England and Europe going back to the 1930s and some of the experiments were shelved; consequently, it is very hard to pinpoint which was the first real SC or USC power plant.

The Philo 1300 MW plant in Ohio was commissioned in 1957 and operated at 310 bars (31 MPa or 4496 psi) and 621°C (1150°F) and was considered the first supercritical (actually USC) plant. It was closed down in 1979. But there are scores of gas- and coal-fired SC plants operational today in the United States and in Europe. In Canada, the first coal-fired supercritical plant was in Genesee, Alberta, and it was commissioned in 2005. Velan supplied valves for that plant. It was a relatively small 450 MW plant.

Going back in history however, a Czech engineer named Mark Benson invented the Once-Through-Boiler concept, which allowed for operations right at the tip of the critical point. A plant was set up in Rugby, England, and later on another one in Belgium. However, there were tube failures and the project was shelved; Babcock bought out the patent for the Once-Through-Boiler and nothing really happened until the mid-fifties. Today in Europe, Japan, and China there are dozens of SC plants in operation. There are, however, different requirements for base loading and variable pressure plants, thus there are different types of designs in place.

VV: SC and USC plants seem to be especially popular in markets like India and China today. Why is that?

China is ranked third after the United States and Russia in terms of coal reserves. India has 202 billion tons of coal reserves. Some scientists suggest that China and India have enough coal to sustain growth for a full century.

Both China and India need enormous energy for their growth requirements. But all this coal has to be easily accessible and also de-sulphurized. The immediate propensity is to use easily pulverized coal, rather than the more advanced Integrated Gasification Combined Cycle, and generate low-cost energy without much regard to emissions. So, abundance of coal and the enormous costs of nuclear power make these proposals attractive. China has been very aggressive in securing its energy needs through its government-controlled power organizations. India's intent is to attract foreign investment and allow private industry to import new technology under state-controlled technology institutions.

VV: What kinds of valves are in demand in these very specific applications?

We are talking mainly about high-pressure (HP) gate, globe, and check valves and perhaps some butterfly valves as well. There could be some applications for metal-seated ball valves in severe service, too. The applications involved could be the following: HP feedwater boiler systems, HP turbine steam supply and extraction systems, intermediate pressure (IP) and low pressure (LP) turbine steam supply and extraction systems, and condensate systems—and there are subsystems in each. So it is my estimate that an

average plant would require $3 million worth of valves. We are looking at valves in carbon steel, chrome-moly, and stainless steel, from A105 and WCB to F22/WC9 to F91 and F92 valves, ranging in size and pressure class from 3" to 28", 900 class to perhaps 3000 class.

Between India and China they are looking at some 900 plants in the next 20 years: So, do the math! This is a program that requires a strategic outlook, strategic deployment, and no small amount of determination. Valve companies who are serious about this market must have a clearly defined and designed supercritical line available. Velan is convinced about it.

VV: How are these applications being affected/controlled by standards like B16.34 and ASME code case?

In the past several years, the ASME code has approved quite a few new materials in terms of material allowables and strengths. The high-creep strength of martensitic 9% to 12% Cr steels, such as P91, P92 (NF616), and P122 (HCM12A), used for thick section boiler components and steam pipes, are the driving force behind meeting the requirements of supercritical technology to temperatures over 565°C (1049°F). However, it is one thing to approve materials for pressure vessels and pipes, and it is another thing to include them in ASME B16.34, to be used for valve design and production. Recently, F92 has been made available with size restrictions in B16.34. There is a smattering of EP&Cs (engineering, procurement, and construction firms) that are ready to specify materials outside B16.34, because the materials have been tested and accepted to materials research done in Europe or Japan. They will accept valves that do not have a B16.34 nameplate.

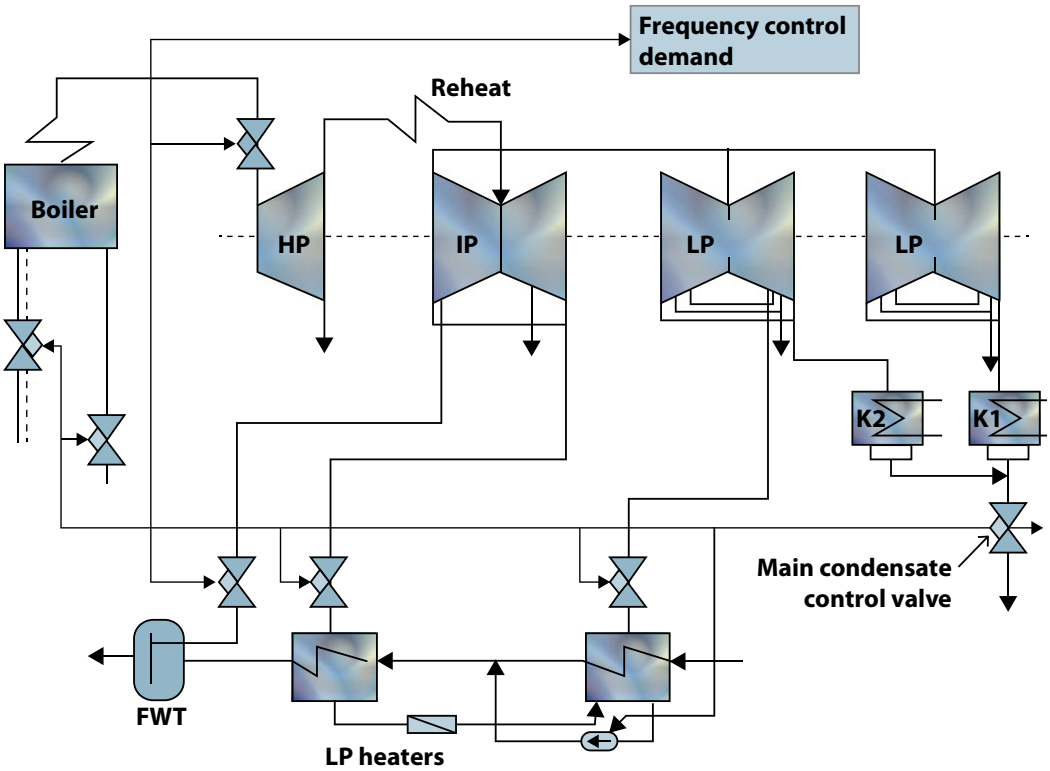
VV: How does the future of SC look worldwide?

One needs to make a quick overview of all available prominent technologies first. Nuclear has had pretty negative press after Fukushima. However, there are third-generation reactors like the Vogtle A1000 reactor where construction is underway. In renewable energy technology, photovoltaic cells are still not able to be manufactured in a cost-effective way, although there are recent reports that China has seriously made a dent in this area with very high-volume production techniques. Solar concentrators are making better progress. Hydropower has had some ups and downs with large dams causing some very serious concerns in agricultural land. With the abundance of coal, and the existence of mature metallurgy and technology, which reduces costs and at the same time cuts emissions seriously, SC and USC seem to be very attractive for the whole world.

VV: Are there any engineering challenges you'd like to address in particular?

Yes, there are some major challenges ahead. For one, there is at times a somewhat formalistic position adopted by the engineering industry, to insist on large valve bores to allow for high-velocity steam flow. With improved water treatment chemistry avail-

Peaking power plant schematic



Operational flexibility is a core requirement for cost-effective power plant operations.

The schematic at left shows typical condensate throttling, whereby in a sliding pressure (or peaking power plant) boiler, quick-acting valves are used to conserve steam both in the boiler and turbine and to maintain system grid temperatures.

In such plants, the main pipelines are made of P92 and the feedwater lines are made of WB36.

able, the industry would like to have whistle-clean pipe and valve bores, with practically no blow down and limited steam exhaust. Therefore, there is a notion that the larger the bore, the less the chances of erosion, noise, cavitation, etc. This is understandable. But these requirements must be quantified by the clients. They often are not.

The valve design must also accommodate exit velocities that are within certain Mach limits at that design condition. This requires valve specific calculations to determine flows and bore diameters. There is a tendency to specify "full bore" or something close to that in high-pressure valves, over 2500 class across the board in customer engineering specifications. Not all valves require such a large bore, with their specific design conditions.

With the increased use of stronger piping material (and thinner walls) the pipe ID is increasing, therefore, valve bores must also increase. So the valve's existing wall thickness is affected. It seems counterintuitive: What is good for the pipes is not always logical for the valve! However, these problems can be surmounted in a variety of ways by making careful and safe calculations of exit velocities, once the flow is known.

VV: Any other challenges you can see on the horizon for manufacturers in regards to SC and USC?

With the higher interpolated pressure classes required, sometimes castings would be required in the larger sizes. The wall thickness of these castings is such that existing X-ray technology may not always be able to penetrate certain areas adequately.

There is much greater awareness today about 9-Chrome material, but with some of the newer variations coming through, there is an element of finicky behavior possible with variations in ingot chemistry. Therefore, procedure qualifications and post-weld heat treatment will require further research and development. **|VV|**

About Rana Bose

Rana Bose, Engineer, was formerly Velan's Executive VP, Engineering, R&D, QA, and TPI. Currently he is a strategic consultant to manufacturing in aerospace, automotive, pressure vessels, special processes, steel, and other mechanical and chemical processes. Rana is a novelist, dramatist, and playwright in addition to having significant business process analysis and Lean management expertise. He has a BS in chemical engineering from Washington University, St. Louis, and a diploma in management from McGill University, Montreal.

Tapping into the expertise of R&D partner

Deloro Stellite

Everyone has a source of stimulation that gets their creative juices flowing on the job front. For the people who work in Velan's Engineering Department, a source of that excitement is the collaborative efforts between the team at Velan and the experts that work in other research companies, think tanks, and universities.

Left to right: Patrick Melanson and Luc Vernhes from Velan; Wendy Rodezno, Andrew Kyte, and Gary Galway from Deloro Stellite; Martin Caouette, Nicolas Lourdel, and Réjean René from Velan; and Danie de Wet and Shelby Hacala from Deloro Stellite.

Developing a unique database

The R&D staff of Velan is working closely with Deloro and Polytechnique Montreal (University of Montreal) on a unique project that will help anyone responsible for specifying coatings. The university research team is developing a comprehensive database of the many properties possessed by different coatings.

"We are trying to characterize the coatings within a dedicated database that will allow our applications engineers to select the appropriate coatings more quickly and precisely," Velan's Luc Vernhes explains. "Each listing in that database will have quality information such as the operations resistance, corrosion resistance, and the many other material considerations," he explains.

The manufacturers and coating developers are helping the university create ways to put numbers to those properties so that applications engineers can make choices based on specific needs of the application, he explained. All of this adds to the considerable intellectual property in the field. As Luc explains, "Selecting the right coating is as much an art and judgement call as it is a science. To make the right selection requires data, however. This collection of information will put that data in place and at the fingertips of those who must make the judgement calls."

You can definitely see an excited gleam in the eyes of Velan's Luc Vernhes, Design Manager, Securaseal Ball Valves, when he talks about the opportunity to work with the research staff of Deloro Stellite.

Deloro Stellite is best known for producing a range of innovative solutions designed to reduce the wear and tear on industrial equipment. The company is known worldwide for the coatings it has developed in aeronautics, power generation, pulp and paper, mining, and many other challenging fields. It was recently purchased by Kennametal Inc., a global supplier of innovative custom and standard wear-resistant solutions with sales revenues of $2.4 billion in 2011 and nearly 12,000 employees doing business in more than 60 countries worldwide. Kennametal is one of the world's largest manufacturers of cutting tools, priding itself on being a technological leader through its $30 million Technology Center in Pennsylvania.

Velan has purchased and used Stellite® alloys on its valves for many years. However, about four years ago, the relationship became much deeper when Deloro Stellite bought a small Montreal-based coatings company. The company, called Plasmatec, had worked with Velan for a decade to develop new thermal sprayed coating technologies.

"In the old days, we bought Stellite® coatings from Deloro Stellite, but we had no special relationship with them as far as R&D went. Nonetheless, Deloro Stellite was a big player in the world of coatings, and we were a big customer for them," Luc explains.

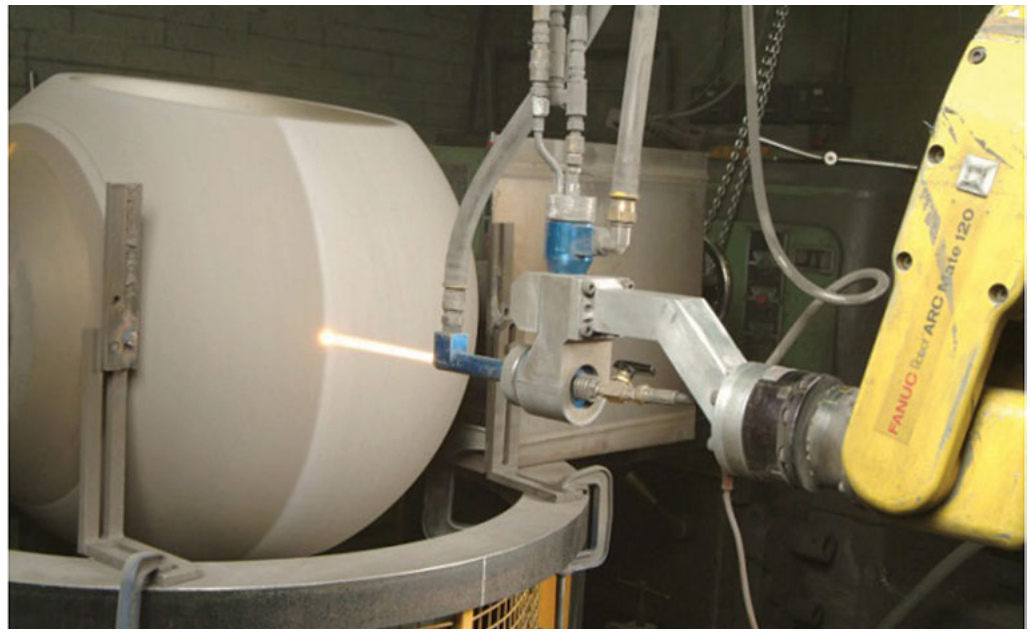
Today, "through our long-term R&D relationship with Plasmatec, we have begun working very closely with the R&D experts at Deloro Stellite too. Our business relationship is very strong, and

we are moving forward technically with some exciting new projects," Luc says.

Great minds think alike

The ability to provide wear solutions to customers is a huge priority for Deloro Stellite. When the company acquired Plasmatec, it was able to add HVOF (high velocity oxy-fuel) and plasma spray coatings to its North American wear solution capabilities, with manufacturing facilities located in Goshen, Indiana, in the United States, as well as Belleville, Ontario, in Canada.

"As a company, engineering expertise at Deloro Stellite had been structured by factory location in the past, with corporate R&D responsible for materials know-how. In other words, the American factory in Goshen was producing welding and thermal spray materials and HVOF thermal spray and PTA (plasma transferred arc) welding equipment, while the Belleville factory had a suite of casting and machining capabilities to produce high-precision Stellite® components," says Danie de Wet, VP, Technology and Business Development of the Deloro Stellite Group. "The addition of a specialist coating service facility complemented our product range and extended our capabilities. What we did was to pool the expertise of all three groups together to give our R&D efforts a much more unified approach to problem solving."



Jet Kote® spraying on a large ball valve.

South African-born Danie, who is now based in the Belleville facility, already had a close working relationship with Velan. "In my group role working across all factories, I was able to link up the key engineering resources at the various factories and make sure we had the right people working on the right problems," he explains.

In terms of what that does for Velan, "This process helped us at Deloro Stellite better understand Velan's needs and consequently pull all resources together as needed, ensuring we give a 'one-stop-shop' approach to technical support regardless of which of our factories the production comes from. In particular, we were able to link up the technical expertise of Goshen, Indiana-based Dave Lee, HVOF Business Manager and a well-known HVOF technical expert in the industry, with the production expertise in Montreal," Danie explains.

As a result, the transition has been a happy one, and for Luc and the many others who work in research at Velan, it has meant an expanded source of brain power as well as the opportunity to access Deloro Stellite's network of top-notch research and laboratory facilities.

"It's exciting to work with so many Ph.D.s and other highly accomplished research staff who are knowledgeable about the latest developments in coatings and who understand the practical realities of running a competitive business at the same time. And the facility in Belleville has some pretty incredible equipment that can perform outstanding testing and analysis," Luc explains.

Deloro Stellite itself is already known for its leading-edge research conducted in tandem with government agencies in Canada and the United States on developing such exciting products as new coatings for aircraft and other markets.

Working with Velan, the company is looking closely at several areas that hold

FusionStell™ Technology

One of the exciting areas where Deloro Stellite and Velan are working in conjunction is in developing FusionStell™ technology. The technology is a way of metallurgically bonding a thin layer of Stellite® or Tribaloy® onto nickel-based alloys and steel substrates.

What that offers design engineers who specify products (such as valves) is the flexibility of combining the wear and corrosion properties of wear-resistant alloys with the mechanical properties of iron and nickel.

The result is a chemical composition that is identical to cast alloys, with a small grain structure that has better fatigue and wear properties than castings. The process involves a complex series of steps for forming a slurry, dipping a substrate component into the slurry, drying it, and sintering it (covering it with powder, thereby allowing different coating thicknesses that can be tailored to specific needs).

FusionStell™ can also be used to deposit coatings on itself, which means it can be used to repair worn surfaces or defects in casting.

"FusionStell™ offers up a technique that can give coatings for critical valves a new range of possibilities," Danie explains. "It's a good example of how Deloro Stellite has worked together with Velan to create something beyond a particular metal product. We are working together on coming up with true leading-edge solutions," he said.

much promise for the valve industry. For example, Velan worked with Deloro Stellite to rejuvenate its Power Ball product, a highly advanced, forged, one-piece metal-seated valve designed for high-pressure/high-temperature applications. The valve is known for its zero-leak efficiencies as well as its long, maintenance-free life. Both properties require top-notch coating materials.

"This is brand new to the industry, a product we've introduced that is new on the market and is beginning to get some good market traction," Luc says.

The beauty is in the details

Velan also has an ongoing project to develop nano-coatings for the mining industry with Deloro Stellite and the National Research Council (NRC) in Montreal. Nano-scale is a fairly new concept that has created much excitement in the coating and other industrial fields. Being explored by Velan as a low-cost, high-performance alternative to chrome plating, it is based on the concept that reducing the grain size of a material increases the material's properties such as mechanical and corrosion resistance.

Although reduction is key, "The very latest research indicates that if you go too small, you lose those material advantages so we are discovering that there is an optimal grain size that gives maximum resistance," Luc explains.

Getting the ideal grain size is a complicated procedure, but it's definitely easier to accomplish in a laboratory environment when compared with the challenges of finding the best methods of applying it. "This is because when you coat anything, you dissipate a lot of energy during deposition, and you have to watch out for damage to the nano-structures," he explains.

Velan's relationship with Deloro Stellite on these and other projects has developed to the point where the two companies will be giving a joint presentation at the next International Thermal Spray Conference in Houston this coming May 2012.

Why such relationships are strategic

Luc explains that relationships such as the one Velan has developed with Deloro Stellite, as well as other research partners, are a vital part of doing business in the industrial world

Left to right: Deloro Stellite's Danie de Wet, VP, Technology and Business Development; Wendy Rodezno, Inside Sales Representative (including Velan); and Andrew Kyte, District Sales Manager (including Velan) with a Hastelloy® trunnion-ball for severe service applications.

High Velocity Oxygen Fuel (HVOF)

HVOF is a thermal spray process using a high-pressure oxygen and fuel mixture to heat and propel a powdered surfacing material to a substrate. Since this is a combustion process, it is limited to temperatures achievable by the mixture of different fuels and oxygen, typically ranging 1800–2400°C (3200–4300°F).

The relatively low temperatures provide conditions to reduce decomposition and/or oxidation of the thermal spray materials. The combustion occurs in a combustion chamber very similar to a rocket engine's design, only smaller. The combustion pressure develops a very high velocity gas stream, which is concentrated into a projecting flame though a nozzle. The flame is supersonic and can achieve velocities of over 1000 m/sec (3300 ft/sec).

Powder is introduced at the entrance of the nozzle along with the high velocity flame and travels inside the nozzle, heating and accelerating the powder. The nozzle geometry adds to the thermal and kinetic energy transfer and develops a tightly collimated flame that is projected to the work piece at very high velocities.

The characteristics of the HVOF device can be modified, and changes in fuels and operating parameters can be made to engineer a wide range of coatings from low-melting plastics (polymers), metallic alloys, and cermets (ceramic metals), to high-melting oxides (ceramics).

The powder particle velocities can range 300–1000 m/sec and 600–2300°C (1100–4200°F) depending on the powder size distribution, density, morphology, and heat transfer characteristics. The most common coatings produced by this process are extremely dense, well-bonded coatings such as WC and/or Cr_3C_2 cermet composites with a wide range of matrixes, including cobalt, nickel, or alloy compositions.

In addition, the process can also produce coatings of metallic alloys such as nickel-, cobalt-, and iron-based materials, which makes the process very useful to engineer wear- and corrosion- resistant surface coatings. These coatings are used to restore or extend new part life in a wide range of industries including aerospace, oil /gas, paper, mining, automotive, and power generation.

today for several reasons. One reason is to find better ways to comply with government regulations. Another is to create smarter high-performance technologies. And while some people might view those two goals as being almost mutually exclusive, Luc's view is much more positive.

"There is a theory called the Porter hypothesis that suggests that regulations and standards drive innovation. They trigger the discovery of new ways of improving a company's competitiveness," Luc says.

Dave Lee, Deloro Stellite's HVOF Business Manager, spraying piston ring grooves with JK®591H (NiCrMo alloy) via Jet Kote® HVOF.

He sees the two goals—promoting regulation and achieving competitiveness—as a necessary juggling act that people in R&D today must inevitably face.

"On one hand, industrial companies have to comply with new standards and regulations, which orient our R&D efforts along the right paths, such as those that are ecologically sound. On the other hand, we must satisfy the business realities we face if we wish to stay competitive," he explains.

"I often feel our mission in R&D and engineering is similar to what drove Steve Jobs at Apple," he continues. "We constantly strive to make things better and more efficiently designed while making their total life cost less. That's innovation," Luc concludes. **|V V|**

Note: Jet Kote, Stellite, Tribaloy, JK, and Nistelle are registered trademarks of Deloro Stellite Holdings Corporation.

Did you know?

Chances are that as a member of the valve industry, you know Deloro Stellite as a global provider of innovative solutions to challenging wear problems, where heat, corrosion, and wear are prevalent. But did you also know:

Inventor Elwood Haynes.

- The company was started by inventor Elwood Haynes of Kokomo, Indiana, who is credited with the development of one of the first gasoline-powered automobiles in the 1890s. He also worked on stainless-steel alloys and early experiments on cobalt metals for cutlery.
- It was founded in 1907 with the patented invention of a Co-Cr alloy called "Stellite®," a material that quickly became known for its superior wear resistance.
- The first commercial Stellite® alloys were produced by M.J. O'Brien of the Deloro Smelting and Refining Company in the town of Deloro, Ontario, Canada in 1912. In 1915, a licensing agreement was reached between inventor Elwood Haynes of Kokomo, Indiana, and M.J. O'Brien.
- Stellite® rights were shared by two companies following the 1915 agreement between Haynes and O'Brien: While Haynes Stellite produced and sold Stellite® alloys in the U.S. and South America, Deloro Stellite did so in the Commonwealth and Europe.
- Deloro opened its first European factory in England in 1919 as its product offerings grew from tool metal to include hard-surfacing products and knives.
- In 1941, the Deloro-based Canadian facilities expanded with new investment in casting operations.
- During WW II, the demand for Stellite® wear-resistant alloys increased in all major industries to prevent premature failure of metal components and to ensure faster machining of armaments and aircraft engine components. By 1949, the company had established a worldwide sales network of 26 agents.
- In 1951, a medical division was established in England to manufacture surgical implants from Stellite® alloys.
- Deloro Stellite Canada relocated in 1956 from the village of Deloro to a state-of-the-art metal-producing facility in Belleville, Ontario, where it is still located today.
- Deloro Stellite England moved to a larger facility in Swindon in 1961.
- In 1970, a third manufacturing plant opened in Koblenz, Germany, to produce precision castings and hardfaced power generation parts.
- A fourth manufacturing plant opened in Goshen, Indiana, in 1982 to exclusively produce Stellite® powders.
- Through a strategic merger under the ownership of the Cabot Corporation, Haynes Stellite and Deloro Stellite joined forces in 1980, which accelerated the development of hard-surfacing products into the aerospace age and led to the need for equipment that could be automated and used for advanced serial manufacturing. Cabot later reorganized the company, and Deloro Stellite became the exclusive supplier of cobalt alloys while Haynes Corporation became the exclusive supplier of nickel alloys.
- In the mid-1980s, Deloro Stellite formed a joint venture in China and opened Shanghai Stellite.
- In 1983 Deloro Stellite began production of the first commercially available HVOF process equipment called Jet-Kote®; Jet-Kote® is currently one of the most popular HVOF thermal spray coating systems available on the market.
- Deloro Stellite acquired Plasmatec in 2008, which was Velan's HVOF and plasma spray coating supplier.
- Kennametal acquired the Deloro Stellite Group in early 2012, and the company began operating from the first of March 2012 under the new brand name of Kennametal Stellite. The company will continue to work in very close partnership with Velan on a growing list of groundbreaking new R&D initiatives.

VMA's annual valve forecast

$4 billion year in 2012, matching 2008's high

Domestic shipments as well as exports to rise

For the third year in a row, shipments for the United States and Canadian industrial valve industry will grow, rising to about $4 billion in 2012. That's an increase of about 2.2% from 2011 levels and equal to the industry's 10-year peak in 2008. Figures were released as part of the annual market forecast of the Valve Manufacturers Association (VMA).

Like all manufacturing industries, valves saw a decline at one point during the recent world economic woes. "For our industry, which tends to lag behind the general economy and its own end-user industries, that drop was about 5% in 2009 (the year of greatest decline), as we had predicted. However, shipments have been rising steadily since then," says William Sandler, CAE, VMA President.

"Although the rise is slight compared to some year-to-year increases early in this decade, the fact that we witnessed three years of growth through a difficult economy shows how strong the valve industry is," says VMA Chairman Bruce Broxterman, President of Richards Industries. "We expect the gains to continue over the next few years," he adds.

One factor that will contribute to growth in 2012 is the rise in domestic shipments, which have remained about the same during the last few years. Exports of valves will again grow: In 2009, exports were at about $710 million; by 2011, they had grown to $760 million, and they are forecast at more than $790 million for 2012.

The projected growth for valve shipments in the industry for 2012 will occur across the entire range of end users with most industries expected to gain slightly in total dollar shipments of valves.

Additional valve market data

Along with its annual market forecast for valve shipments, the Valve Manufacturers Association (VMA) released historical data on past valve shipments by product category and total shipments, as well as its annual breakdown of valve shipments by end-user markets. A few highlights include:

Shipments by valve categories (2002-2011)
In 2011, automated valves accounted for the biggest share among valve types ($1.2 billion), followed by ball valves ($718 million), and gate, globe, and check valves ($577 million).

Total individual valve shipments over the past 10 years
Valve shipments in 2011 at $3.915 billion were the strongest they've been during the past decade except during their peak in 2008 at $4.0 billion in sales. In 2001, valve shipments were about $3.1 billion.

Distribution forecast of end users in the 2011 valve market
Of the 15 markets tracked by VMA in 2011, water and wastewater had the largest share at about 18%, followed by chemical (17%), petroleum production and petroleum refining (each at about 12%), and power generation (11%).

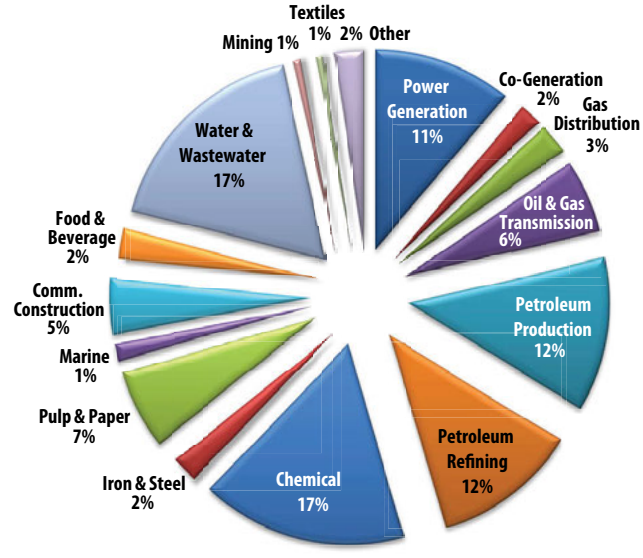
Industrial valve shipments by end-user industry: 2003-2012

(Percent of total)

INDUSTRY	2003	2004	2005	2006	2007	2008	2009	2010	2011	Forecast 2012
Power generation	11.1	11.0	11.1	11.1	11.1	11.1	11.1	11.1	11.1	**11.4**
Co-generation	2.0	1.8	1.8	1.7	1.8	1.8	1.8	1.8	1.8	**1.9**
Gas distribution	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5	**2.5**
Oil and gas transmission	5.6	5.7	5.7	5.7	5.7	5.7	5.7	5.9	5.9	**5.8**
Petroleum production	12.3	12.4	12.3	12.4	12.3	12.3	12.3	12.4	12.4	**12.4**
Petroleum refining	11.1	11.4	11.5	11.5	11.5	11.5	11.5	11.7	11.7	**11.7**
Chemical	16.9	16.2	16.3	16.4	16.3	16.3	16.3	16.7	16.7	**17.1**
Iron and Steel	1.8	1.8	1.7	1.7	1.7	1.7	1.7	2.1	2.1	**2.0**
Pulp and Paper	6.7	6.3	6.3	6.4	6.3	6.3	6.3	6.4	6.4	**6.7**
Marine	1.5	1.5	1.4	1.3	1.4	1.4	1.4	1.4	1.4	**1.4**
Comm. construction	5.2	5.3	5.4	5.4	5.4	5.4	5.4	4.5	4.5	**4.5**
Food and beverage	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.4	2.4	**2.4**
Water and wastewater	17.4	17.9	18.0	18.0	18.0	18.0	18.0	17.6	17.6	**16.8**
Mining	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	**0.6**
Textiles	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	**0.5**
Other	2.6	2.7	2.6	2.7	2.6	2.6	2.6	2.3	2.3	**2.3**
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total industrial valve shipments ($billions)	3.16	3.22	3.47	3.70	3.81	4.00	3.80	3.85	3.92	4.00

Source: Valve Manufacturers Association

Distribution forecast of end users in the 2012 valve market



At Velan, we know what it takes

to design and manufacture industry-leading valves that stand the test of time.

After all, we've been doing just that for over sixty years.

We offer a wide range of valves designed to meet any industrial application. So next time you're in the market for a metal-seated valve that features positive shut off in both directions, you can rely on our severe service ball valves.

When it comes to valves that offer low emissions, easy maintenance, and long and reliable service, Velan is the name to trust.

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