

CANDID visions

Dresser-Rand Global Manufacturing — Setting the Standard

Editor's Note:

The following Candid Visions column is devoted to an interview with Jean-Francois Chevrier, vice president and general manager, European Operations; John Hanigan, vice president and general manager, Asia-Pacific Operations; and Chris Rossi, vice president and general manager, North American Operations (NAO), who responded to questions regarding Dresser-Rand's manufacturing operations. Following this interview (effective March 31, 2007), Rossi was named executive vice president, Product Services Worldwide, assuming responsibility for all Dresser-Rand aftermarket parts and services sales and for mergers and acquisitions. Chevrier was named vice president and general manager, North American Operations with direct responsibility for the Burlington, Iowa and the Olean, Wellsville and Painted Post, New York operations, including the engineering and drafting centers, and full responsibility for Dresser-Rand's global Research and

Development Engineering organization.

INSIGHTS: Several years ago, Dresser-Rand grouped its manufacturing operations into three regions — North American Operations, European Operations and Asia-Pacific Operations. How are manufacturing projects assigned among the facilities today?

ROSSI: We consider several factors when sourcing manufacturing projects; these include the type of equipment, client preferences, government restrictions, workload at each facility, delivery logistics, and testing requirements.

In the past, Dresser-Rand's manufacturing facilities were part of separate product divisions. Although the operations worked together, each facility acted to meet the needs of its own clients and each had its own set of business goals and demands.

A few years ago, Dresser-Rand reviewed its business model and saw an opportunity to leverage manufacturing capabilities and experience and technical resources across all of our manufacturing operations worldwide. We proceeded to create synergies that would benefit our

clients, employees, and investors worldwide.

This regional structure gives Dresser-Rand tremendous opportunities to leverage its expertise, experience, and best practices across facilities and allows us to transfer technology among facilities. For example, we can build a compressor in our Olean, NY facility and manufacture spare parts for it in our Le Havre, France facility.

INSIGHTS: How is product consistency ensured from location to location? For example, how do replacement parts from one facility guarantee compatibility with a unit manufactured at another facility?

HANIGAN: Product consistency is ensured in a variety of ways. Each manufacturing facility relies upon Dresser-Rand Company engineering standards and specifications to ensure consistency and quality from one facility to another. Our worldwide standards and continuous quality control and quality assurance procedures — for example, engineering specifications with certifications — are established and followed.

INSIGHTS: What special requirements



Chris Rossi, Vice President and General Manager, North American Operations (NAO)



John Hanigan, Vice President and General Manager, Asia-Pacific Operations



Jean-Francois Chevrier, Vice President and General Manager, European Operations

does Dresser-Rand employ on behalf of US Navy projects?

ROSSI: Dresser-Rand uses detailed build-books for all assembly processes that guide employees through the assembly and documentation process for all major US Navy-bound steam turbine unit assemblies. Our equipment for the Navy — including steam turbines, compressors and blowers — meets some of the most demanding specifications, including high shock to MIL-S-901D, mechanical vibration to MIL-STD-167-1A and electromagnetic interference to MIL STD 461E. In addition, there are more than 60 unique welding processes and procedures that are US Navy-approved and site-specific.

We are regulated by the Defense Priorities & Allocations System to assure the timely availability of industrial resources to meet current national defense and emergency preparedness program requirements. And there are special security provisions in place at our applicable facilities to protect NOFORN information, which is information that cannot be seen by any non-US citizens.

We also participate on several special integrated design teams comprising Electric Boat, Newport News, and NAVSEA team members.

INSIGHTS: “Lean” is a management philosophy that focuses on reducing the “seven wastes” — over-production; waiting time; transportation; processing; inventory; motion; and scrap in manufactured products. Please describe Dresser-Rand’s approach to “Lean Manufacturing” and discuss some of the techniques that are in place at various Dresser-Rand facilities.

HANIGAN: Implementing “lean” is one of the company’s critical strategic priorities. Our process innovation group was formed in 2002 to engage full time resources in continuously improving and eliminating waste, for example, waste in the form of poor quality, excess cost, or poor delivery performance. Through a technique called value stream mapping, our process innovation leaders work with the business process owners to rigorously map current process states and define the actions necessary to achieve the desired “leaned out” future states. Our process innovation experts focus on all business processes and are therefore

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— Chris Rossi
(then) Vice President and General Manager North American Operations

involved in continuous improvement efforts in the areas of manufacturing, quality, engineering, supply chain management, finance, compliance, human resources, sales and marketing, and client care.

Another technique used to expose and eliminate waste is workplace organization, which is achieved through a procedure known as “6-S.” Dresser-Rand uses 6-S for better housekeeping, and for a health, safety, and environment (HSE) focus. The six “S’s” to success include:

- Safety - A healthy and safe work environment
- Sort - Categorize and discard unnecessary items
- Straighten - A place for everything and every thing in its place
- Sweep/Shine - A clean work environment
- Simplify/Standardize - Be consistent, reduce/eliminate non-value-added steps
- Sustain - Commitment to continuous improvement

ROSSI: To improve its competitiveness in the marketplace, Dresser-Rand North American Operations (NAO) adopted the concepts of lean to help optimize the value stream of our manufacturing processes and eliminate or reduce non-value-added activities.

One of the tools of lean is “Kaizen.” Kaizen events are rapid, continuous incremental improvement activities designed to eliminate non-value-added steps in a process. In a kaizen event, the team of six to eight participants work full time to compress the process improvement activity, including implementation, into a completion period of three to five days.

The primary focus of the teams has been to reduce the throughput time for many of the key components manufactured in the NAO plants. There have also been teams that

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Operations

streamlined processes for such things as reducing the time for providing clients with quotations and developing a process and set of tools for capacity planning and load leveling.

INSIGHTS: What types of challenges does the Naroda, India manufacturing facility face in the Asia Pacific Region?

HANIGAN: Dresser-Rand India Pvt. Ltd. began manufacturing reciprocating compressors in Ahmedabad in 1970. At that time, the company was a joint venture producing reciprocating air compressors for process/industrial services under license and part ownership of Ingersoll Rand Company. The company started manufacturing large frame compressors in 1995 and was purchased by Dresser-Rand in 2000.

Today, the 200,000-square-foot (18,580-square-meter) facility, located 500 km (311 miles) north of Mumbai, manufactures API-618-compliant, light-range process reciprocating com-

pressors. Also, the facility recently began producing and shipping major parts to Dresser-Rand USA and other Dresser-Rand facilities. The factory is ISO-9001 certified (since 2000), ISO-14001 certified (since 2004), and adheres to all Dresser-Rand quality standards.

There are some unique challenges that we face in India. First is language. Even though the majority of our employees speak English, we still have a large number in the facility who speak the local Gujarati dialect. This creates some challenges for training and written instruction, especially when we have foreign instructors.

There are infrastructure challenges as well, especially for our vendors or suppliers. Logistics such as available roads and movement of goods to and from our factories and vendors must be thought out well in advance and sometimes roads must be built in time for travel. The same holds true for our own employees traveling in this region — visiting clients, vendors, and so forth.

INSIGHTS: Describe Dresser-Rand's safety record and initiatives across the different facilities.

HANIGAN: The Naroda, India, manufacturing facility has lead the way in the Asia Pacific Region. The facility recently logged more than 1.4 million injury-free hours. Overall, the entire Asia Pacific Region has an outstanding safety record with a total recordable injury rate of 0.4 in the past three years. During this period, this region had only six recordable injuries in more than 2.8 million hours of operation.

ROSSI: Dresser-Rand's safety program has made steady progress during the past five years and continues to make significant progress, due in large measure to implementation of a new process to educate and involve Dresser-Rand employees worldwide. At the core of this

program is the Health, Safety and Environmental Management System, or "HSE." The HSE Management System brings a structured approach to changing behaviors around safety and identifying unsafe acts and conditions that can be improved before a safety incident occurs. The elements of the HSE Management System are consistent throughout Dresser-Rand operations worldwide and have helped drive significant improvements in safety performance. For example, our Olean, NY facility had 22 injuries in the first 10 months of 2005 for a total recordable rate of 2.9. We began a program focused on process

refinery with no recordable injuries.

CHEVRIER: Every effort is used to make our employees aware of risks and help them adopt improved safety behaviors. The same effort [eliminating unsafe acts] was undertaken at Le Havre where employees had 14 injuries in the first nine months of 2005 for a total recordable rate of 3.0. Since that time, they have achieved a total recordable rate of 0.5.

Safety has always been a top priority at Dresser-Rand's European operations and we're committed to keeping the safety of our employees as our number one concern. Based on a team effort

INSIGHTS: What kind of guidelines do Dresser-Rand facilities adhere to in order to meet and comply with industry, government, and environmental standards?

CHEVRIER: Dresser-Rand is recognized as a leader in designing custom-engineered equipment to meet rigorous client specifications that include industry, government, and environmental standards and requirements. We're committed to achieving our objectives by satisfying clients through business activities and processes used to prevent pollution, reduce or eliminate negative impact on the environment, and comply with applicable government regulations.

All of our manufacturing facilities are ISO certified, and our equipment is designed and manufactured to other applicable industry standards, including API and ISO.

"ISO" stands for the International Organization for Standardization, located in Geneva, Switzerland. It promotes the development and implementation of voluntary international standards for particular products and for environmental management issues. The American Petroleum Institute (API) is the primary trade association of the oil and gas industry, representing more than 400 members. Among its services is the compilation of standards pertaining to the design and application of equipment used throughout the industry to assure safe, efficient, and reliable operation.

INSIGHTS: What role does product testing play at the various facilities?

CHEVRIER: Our ISO-certified facilities are among the world's most advanced for turbocompressor design, production, and testing. At our world-class test facilities in Le Havre, France, and Olean, New York, we have invested in the most advanced testing capabilities in the industry, and cultivated the knowledge of exper-



The Dresser-Rand facility in Naroda, India, has demonstrated an outstanding safety record.

improvement, and since that time Olean has achieved a total recordable rate of 0.7.

Moreover, our commitment to safety extends well beyond our manufacturing operations. Last year, Dresser-Rand's Field Services organization received the Contractor Merit Award from the National Petrochemical and Refineries Association (NPRA) for two separate jobs for achievements in safety performance. Our employees worked 32,818 hours in 2005 at a Texas refinery and 21,694 hours at an Illinois

refinery with no recordable injuries. involving management, supervisors, employees, and unions through the Health and Safety Council, we've continuously improved safety practices and developed safer work environments.

The ISO 14001 certification obtained by the Le Havre facility in 2002 has helped develop awareness among employees and encourage safety and quality practices of the highest standard. Last year, the French National Mechanical Industry Employer's Association awarded Dresser-Rand Le Havre Operations its annual safety award.

rienced test engineers. Both Dresser-Rand facilities are proficient at performing not only full mechanical testing, but also full-load, full-pressure ASME PTC10 Type I performance string testing.

ROSSI: In addition to testing production units to verify the performance of our compressors, we also conduct R&D testing for new products. For example, last fall, we announced that we were developing a fully Integrated Compression System, or ICS, engineered to provide an efficient, compact solution to compression system design.

The ICS, being tested at our Olean facility, provides a complete compression system that can be applied to all markets — upstream, mid-stream and downstream — with the smallest footprint, reduced weight, and at a lowest total installed cost. It uses as a platform high-efficiency DATUM® centrifugal compressor technology driven by a high-speed, close-coupled motor, with an integrated rotary gas-liquid separation unit, packaged with process gas coolers in a single module.

INSIGHTS: How do you share best practices among the different facilities to demonstrate your commitment to operational excellence?

HANIGAN: We use many of the same metrics worldwide — safety, on-time delivery, cost of quality, first pass yield, cycle times (by product), productivity, and so forth. Many of the different areas within the operations have metrics that they are using which are unique to their processes — all with the end goal, however, of meeting the client's requirements.

ROSSI: One of our key attributes that is highly valued by our clients is short delivery cycle times. We strive to achieve industry-leading cycle times by employing advanced world-class business practices and tools such as the



Dresser-Rand's facility in Kongsberg, Norway

Corporate Product Configurator. This proprietary [Configurator] software automates the preliminary engineering phase of designing a product to client specifications and automatically generates design drawings and bills of materials. This, in turn, reduces costs and cycle time. We've made significant strides in cycle time reduction and improvements in on-time delivery at several operations. These "lessons learned" and common business processes are then applied to other Dresser-Rand facilities.

CHEVRIER: A successful example of sharing best practices was when the Olean test stand personnel began their cost reduction program in 2004 and the team used the Dresser-Rand Le Havre facility as its benchmark.

The Olean team looked to Le Havre to help with cost reduction and improved safety. During their visit to Le Havre, the Olean test stand personnel reviewed Le Havre's organization, cleanliness, and safety of the test and assembly area, for which a President's Award was presented last year.

As a result, the Olean test stand team implemented new alignment criteria, a tubing cart and floor stock bolting hardware, lube oil stations, tubing fittings inventory, orifice sizing matrix, and many other improvements that were modeled after the Le Havre facility. ■