

# Double celebration

At the Emerson Process Management facility in Waller, Texas, staff are probably getting the hang of putting up the decorations. In 2005, festivities marked the fiftieth anniversary of the first-ever Bettis actuator and in just a few month's time, staff will be celebrating another fiftieth birthday party. This celebrates the development of the Bettis spring-return actuator – believed to be the first-ever that was marketed and the industry standard for ESD valve applications. For a closer look at the past, present and future of Bettis actuators, we spoke to General Manager Joe Corrigan and Product Marketing Director (scotch-yoke business) Shailesh Sharma.

In a fast-changing world, knowing which businesses you can rely on can be very reassuring. In that respect, if it's actuators you're looking for, then Emerson must surely be high up on your list. After all, its Valve Automation division includes many of the world's leading brands, boasts a global network that is second to none and is recognised as a pioneer when it comes to research and development. In addition and, perhaps even more importantly, the individual brands have well-established track records – stretching back fifty years in some cases.

The Bettis brand is an excellent case in point, with the first-ever Bettis actuator being manufactured in 1955. That pneumatic rack-and-pinion model was specifically developed to automate lubricating plug valves. The next product generation followed quickly, featuring a cast aluminium housing, rack-and-pinion gearing and bronze internals. Its design was air fail-safe with a low torque output. In the following year the first Bettis scotch-yoke quarter-turn actuator was introduced. By today's standards the square-bodied construction may appear quaint but the actuator was exceptionally well-designed, delivering

three times the torque outputs of the rack-and-pinion models. Bettis continued this rapid pace of development, launching what is believed to be the world's first-ever spring-return actuator in 1957. Incidentally, this product was designed and built following an off-hand remark from a customer, who later admitted he did not imagine anyone could actually make such a unit.

A few years on and the CB model actuator was launched (now CBA offering). This actuator quickly became the mainstay of the Bettis product offering, remaining a major workhorse for valve automation in virtually every industry until phased out in the late 1990s. The CB actuator typifies all that is good in each and every Bettis product – built to provide lasting performance with a minimum of fuss. In fact, many of the early CB actuators are still in active service today, requiring little in the way of maintenance except for seal replacements. Later milestones included the introduction of the D-Series pneumatic rack and pinion actuator, which provides reliability and economy in valve automation, as well as the G-Series, comprising pneumatic & hydraulic scotch-yoke models.

## Technical challenges

Underpinning the extensive Bettis range is the campus-style production facility in Waller, Texas. Visitors here always comment on the highly efficient manufacturing processes and levels says Mr Corrigan. "To ensure competitiveness on an increasingly global stage we successfully introduced the lean manufacturing philosophy some four years ago and continue to spend heavily on issues such as supply chain management. Other areas for investment include pre-sales support tools such as valve sizing programs and automated quotation systems. But what really impresses most visitors is how we have doubled our production capability at Waller during the past eighteen months. Capacity will continue to grow as we roll out further plans." Importantly, the Waller facility is not just a manufacturing location but also houses the global engineering headquarters as well as the global sales and marketing headquarters for the Bettis product range. Says Mr Corrigan: "Keeping manufacturing, sales



# for Bettis actuators



The instantly recognisable "Bettis orange" (trademarked in the U.S.) has stood out as a symbol of continuity in valve automation for the past fifty years.

Emerson has wide ranging valve automation capabilities, including the provision of actuators and a full complement of controls and systems.

and engineering staff close together has significant benefits. For example, when a marketing employee hears comments or ideas from clients, these are quickly discussed with engineering. Everyone at Waller enjoys taking on technical challenges, and we have a certain reputation for the speed with which we can translate a drawing board idea into a marketable product. This fast response is another issue which differentiates Bettis in the marketplace."

Asked if he could provide any examples of such fast-track development, Mr Sharma recalls one project which started back in 1988 when Bettis marine actuators were adapted to operate Emergency Shutdown Valves following the Piper Alpha tragedy. "With innovative engineering, Bettis marine actuators were modified for demanding platform services such as the splash zone near the water's edge and subsea to depths of more than 1,000 feet. These Bettis actuators, some weighing up to five tons and approaching 20 feet in length,

became the market leaders in this offshore segment, not only in the North Sea, but also in the U.S. Gulf of Mexico and in the Far East," he says.

Product development is often fuelled by Bettis' regular "Voice of the Customer" initiatives, notes Mr Sharma. "We encourage feedback from all our clients – from resellers to end users – which helps us identify those product improvements and developments the customers needs and wants. For example, in the G-Series we have enhanced the life-time of the actuator and also introduced on-line maintenance and repair capabilities. More recently, we have taken industry's requirements about Safety Instrumented Systems (SIS) and Safety Integrity Levels (SIL) on board. With augmented industry safety requirements, Emerson is at the forefront of innovation with Bettis products and features such as its SIL-PAC, an integral final control element as part of a plant's safety instrumented system."

### Impressive range

The Bettis name is just one of six strong partners that constitute the Valve Automa-

tion division, which also includes Dantorque, El-O-Matic, Hytork and Shafer. Individually, each name is highly respected in the automation business; as a group, they constitute a vast array of products covering almost all actuation needs. Pneumatic actuators include both rack-and-pinion as well as scotch-yoke models. Designed to operate reliably and efficiently, the quarter-turn rack-and-pinion units have proven ideal for ball, butterfly and plug valves as well as applications including extreme temperatures, corrosion and high-cycles. Integrated control options can be readily added for improved functionality and positioning. Output torques range up to 60,623 lb-in for double-acting models and 17,333 lb-in for spring-return models.

The new generation of scotch-yoke pneumatic actuators offer torques sufficient for virtually any application – large or small. The G-Series in particular boasts an impressive range of features, such as guaranteed output torques, water ingress protection, corrosion resistance, NAMUR standardization, close coupling, overrides, modular components and a standard 5 year warranty. Output torques are avail-



Available for both on and offshore duties, Bettis actuators have a reputation for operating under the most arduous of condition

Operated by line gas pressure, Bettis gas-hydraulic actuators are used on natural gas pipelines around the world

able up to 6,000,000 lb-in for double-acting models

The range of electric actuators also provides optimum performance under the most demanding on/off and modulating conditions. Compact models give trouble-free operation with small, medium or large valves. Bettis electric actuators offer maximum duty cycles to 100%, with none lower than 30%, in all available motor voltages. Output torques can reach 10,000 lb-in. As a matter of course, smart electric models support bus communication protocols.

A wide variety of configurations are available for hydraulically-powered actuators including scotch yoke, rotary vane, linear and helical spline. These powerful, yet efficient actuators are used in double-acting or fail-safe spring-return designs for either onshore or offshore applications, including demanding subsea service and marine applications. Output torques reach 6,000,000 lb-in. Finally, customers can also choose from gas-hydraulic units, already deployed on natural gas pipelines around the world. Available in scotch-yoke, rotary vane or linear designs, they operate efficiently using line gas pressure.

Control options include linebreak detection systems, remote control and high/low shutoff. Direct gas actuators are also available, with output torques up to 6,000,000 lb-in.

### Distribution

To ensure clients have proper access to this wide product range the Valve Automation division has both established an extensive network of distributors and also built a close working relationship with global and national valve makers. Says Mr Sharma: "Our actuators are sold by some of the industry's most experienced valve automation partners. They understand users' needs and can recommend the best actuator for each individual job. They compliment our products by delivering complete packages and systems and, in many cases, draw on the whole range of automation products available from Emerson. Also important is our good standing with leading valve makers, who see us as the ideal neutral partner."

Distributors are provided with the training and facilities to provide front-line customer care to Bettis' clients. "Our business is not about quick sales, but rather to



provide our clients with long-term automation solutions," emphasizes Mr Sharma. "If support is needed, clients appreciate being able to call someone local, someone who has the knowledge and spare parts necessary to effect immediate repairs. This proven after-sales capability is another way Bettis differentiates itself." Asked further about the client base, Mr Sharma confirms that the Valve Automation division has products located in just about every country around the globe. "Particular growth areas for the Bettis product range include offshore systems in the so-called Golden Triangle, namely the Gulf of Mexico, Brazil and West Africa. As you may expect, in this region products are in great demand to support the growth and expansion in oil and gas projects. The Bettis product with size, weight, and reliability advantages is the preferred

## FACTS & FIGURES

Name:	Bettis
Established:	1929 as an oilfield supply house and manufacturer's representative.
Main business:	Independent manufacturer of pneumatic and hydraulic valve actuators.
Key markets:	Oil & gas (onshore and offshore production, transmission and storage) LNG, refining, chemicals, petrochemicals, power industry (conventional and nuclear), pulp & paper, food & beverage, pharmaceutical, textile and water systems.
Facilities:	Waller, Texas, (HQ, Manufacturing, research, engineering and office facilities) Bettis France (Fully owned Valve Automation Center) Bettis UK (sales office and fulfilment center)



Emerson's valve automation brands include Bettis, Shafer, Dantorque, El-O-Matic and Hytork, a range that covers almost all actuation needs.



Emerson's SIL-PAC, a key element in a smart safety instrumented system, enabling an integrated approach to complete safety loops — from sensor to logic solver to final control element.

solution for offshore production systems. We are also continuing to supply actuation solutions to brownfield and greenfield investments in the offshore, gas and LNG processing fields in the Middle East, Latin America, China and

South-East Asia. In that light, I can also confirm Bettis will soon be making major investments to further enhance customer service in the Asia Pacific area," he adds.

### Customer focus

Asked if he could identify any trends in the actuator business, Mr Sharma again stresses that more and more clients are looking for turn-key automation systems. "Our capabilities regarding automation solutions are second to none. As a part of Emerson, we benefit from a full complement of controls and systems to assure optimum performance of our valve actuators. These include Fieldbus communication devices, switchboxes, solenoids, positioners, limit switches, ESD Systems, manual override gear operators and hydraulic power units. As you can see, we have the resources to meet varying needs,

whether the client wants a single replacement part or is placing a multi-million dollar order."

Concluding the interview, Mr Sharma notes: "Emerson's Valve Automation division capitalizes on more than 100 years of combined experience dedicated to only one thing — controlling and automating valve operation. No one else can offer the breadth of product or the scope of service. We are truly a "one-stop-shop" for valve actuation. You'll find us wherever valves need to be operated automatically.

We have experienced factory-trained representatives and service technicians available to provide a solution to your requirements. And as the world's leader in valve automation, we will continue to innovate and improve on the quality of our products. During the half-century since the Bettis brand of actuators and controls was inaugurated there have been many changes in global markets and technologies. But at Emerson the goal remains unchanged: to provide clients with the very best process automation solutions that can be found." ■

### About the Valve Automation Solutions division

Within the Emerson Process Management Group, the Valve Automation Solutions division consolidates a vast array of valve automation products and services. The division brings together well-known industry leaders Bettis Actuators and Controls, El-O-Matic International, FieldQ, Hytork International, Shafer Valve Operating Systems, and Dantorque.

The Valve Automation Solutions division is a world leader in pneumatic, hydraulic, electric, and gas-hydraulic valve automation products and services. The division's focus is on providing valve automation products and services to complement Emerson's extensive capabilities in automation solutions for the process industries.