FCX innovation takes LNG

FCX Orton's triple-offset, metal-seated, top-entry, replaceable seat and seal valve, is revolutionising flow control in the LNG industry. This is the latest in a string of clever valve designs that has contributed to doubling plant turnover in the past four years according to General Manager Alberto Aliani and Houston-based V.P. Sales Davide Zirondelli. When Valve World visited their facility, they discussed the technology underpinning their latest valve and looked at the benefits it can bring to a whole host of industrial markets.

By David Sear and Joanne McIntyre

FCX Orton has invested in a massive bunker for cryogenic and high pressure gas test for valves up to DN 2600.

FCX, the international specialist distributor and manufacturer of valves, instrumentation and related flow control products, was created in the early 1990s following the merger of several established valve players. Ever since, FCX companies have continued to drive valve technology, putting themselves at the forefront of many niche markets. Nowhere is this more evident than when visiting FCX Orton, near Milan, where visitors can find an example of a triple-offset, metal-seated, top-entry valve upon entering reception.

Says Mr Aliani: "The new FCX valve is the first valve available in class 600 and 900 with a triple-offset, metal-seated, side-entry design. It was created by marrying our knowledge of triple-offsets with FCX's top-entry Royal cryogenic valve. The resulting advantages, such as the zero leakage, the non-rubbing seating and the inherent fire-safe properties, have been quickly recognised by the marketplace. Moreover, the valve offers a very low cost of ownership due to the replaceable seat and seal, and once fitted is expected to operate for many years without leaking."

"We have created a product which can be installed throughout the entire LNG chain," comments Mr Zirondelli. "It is the perfect complement to our existing MV-Series triple-offset valves. So whatever your LNG application, from the liquefaction plants to the tankers, from the receiving terminals to storage, from gas compression stations to the power generation plants, literally the same basic valve design can be used for the entire chain. With the new side-entry design, users can change the seats and seals with the valve in-situ, making it particularly ideal for LNG transportation and receiving stations."

Valve of choice

Anticipating such a major growth in business, FCX Orton has been investing heavily for quite some time. A 1,800m^2 plant expansion was quickly undertaken and additional CNC-controlled equipment has already been installed. In addition, a purpose-built cryogenic bunker has been operational since 2003 in response to worldwide requirements and also to enable ongoing R&D.

FCX Orton plans to further extend the production range of its top-entry valve in high pressure classes and large sizes. "To date we have manufactured up to 66 inches in class 150 for cryogenic applications," notes Mr Aliani. "The next step for us is a 60 inch, class 600 valve. In our test facility we can test cryogenic valves up to 104 inches in diameter."

Mr Zirondelli adds that FCX Orton has already manufactured one of the world's largest-ever class 600 triple-offset valves, with a 56 inch diameter. This was destined for use with so-called hot gas,

Mr Davide Zirondelli, FCX Orton's V.P. Sales (Houston): "FCX Orton has already manufactured one of the world's largest-ever class 600 triple-offset valves, with a 56 inch diameter."

market by storm

This DN 30", #600 cryogenic MV model was destined for the Damietta project in Egypt.

FCX Orton has the resources to serve major projects. Some 128, ND 24", #150 aluminum bronze valves were shipped to the Ras Laffan LNG Plant in Qatar.

The MV is also ideal for ESDV applications. These valves, made of Monel and 316L, are used in oxygen and hydrogen plants at Sasol, South Africa.

FCX Orton's General Manager Mr Alberto Aliani: "FCX's MV model is the first valve available in class 600 and 900 with a triple-offset, metal-seated, side-entry design."

namely the gas at ambient temperature prior to the liquefaction stage. "Even just a couple of years ago the ball valve design would have been automatically selected for such an application. Now, however, our triple-offset design is becoming the design of choice," he states. Asked why specifiers are moving to the triple-offset, Mr Zirondelli said that the price/performance balance was the key. "A comparable 56 inch ball valve would be more than double the price and weight. This means that huge space savings can also be realised, which is an important advantage for many end users. In addition, a ball valve this large would normally be soft-seated, whereas we offer a metal-to-metal seating which translates into superior performance. In short, our valve is more reliable, requires significantly less torque to operate and can be used in wider range of conditions."

New business model

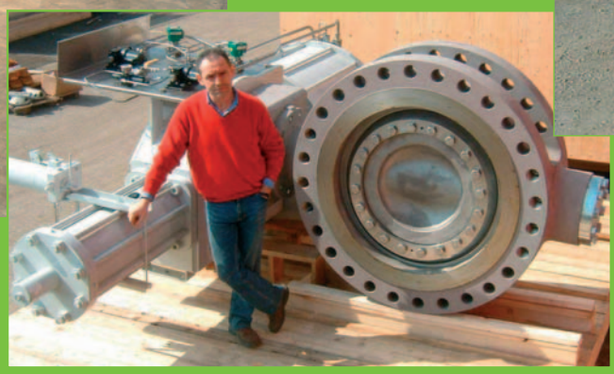
While five years ago FCX Orton's production was evenly split between projects and stock, now everything is made to order and the company focuses almost exclusively on projects. This new business model presented initial challenges, as project demand tends to exhibit peaks and troughs. Mr Zirondelli: "Naturally we modified our organisation to pursue projects right from their inception, often up to two or three years ahead. Contractors like JGC, KBR, Bechtel, Fluor, CB&I, CHIYODA, Kellogg, Technip, SAIPEM and many others are increasingly viewing us as their ideal project partner. What makes us different is that we are fully dedicated to working with them as a team, which is something clients genuinely appreciate." Mr Aliani adds that FCX Orton is supported by a pool of reliable and highly-qualified sub-suppliers to help cover peaks in production. "We are strategically located in Northern Italy, a region recognized as a centre of excellence in valve manufacturing technology," he comments. "However, we will always keep the critical machining of our metal seated valves in-house." Further discussing production, Mr Aliani said that all FCX Orton's triple-offset designs now account for some 90% of output, compared to just 30% some five years ago. Despite this figure, FCX Orton plans on retaining its engineering competence and manufacturing capabilities for soft-seated valves. "The ability to provide packages is one of our key selling points," explains Mr Aliani. "For instance we recently received a large order from JGC for a project which required significant numbers of both rubber-lined and metal-seated valves."

Exotic materials

As a leader in specialist products, working with exotic materials and demanding specifications is familiar territory for ▶

Four MV valves, size 92", were supplied to the Jebel Ali Power Station through Toshiba.

Desalination units and power plants are also markets for FCX Orton's triple offset valve. These DN 72", #150 butt weld models are for steam application at Umm Al Nar in the UAE.



The MV valve can be used throughout the gas chain. This DN 48" (1200 mm) ANSI Class 300 model for modulating application was supplied through Snamprogetti for use in the Qatif Gas Plant in Saudi Arabia

FCX Orton's MV design is very compact. The photo clearly shows how the 18", #600 Orton MV valve on the right requires much less space than the 24", #150 gate valve on the left.

FCX. "At the moment we are busy with a KBR platform in the UK which requires a lot of valves in super duplex, duplex and other exotic materials," says Mr Aliani. "We were recently awarded a contract from JGC for the Dolphin Project at a gas plant in Qatar and also supplied class 300 titanium valves for PTA (purified terepthalic acid) plants in Hengsheng, China. Valves made of Monel, Hastelloy, 254 SMO, etc, also regularly leave our premises."

Mr Aliani notes that FCX Orton recently passed a milestone, qualifying for the Shell specification 77-312. "We are supplying a huge, JGC-engineered project, with Shell as the final end user. Requirements included conducting Shell Edition 2001 Cryogenic and Fugitive Emission Tests on valves up to 54 inch, class 150. Quality assurance naturally remains a priority for FCX Orton and its clients. As FCX Orton sees its products being increasingly used in demanding applications, there has been a parallel increase in visitors to the plant. Mr Aliani: "Four years ago we received perhaps one inspector every day. Now we are seeing three or four per day, coming to inspect valves for project orders and witness the final tests. Quality control and assurance requirements are a large component of the job. This means we need very good project administrators. Kick-off meetings and contract review meetings are part of our daily routine, where all technical and procedural details are reviewed. The awareness of customer requirements is paramount for a successful approach to final delivery culminating very regularly in a witnessed final inspection. These demands mean that we need to be flexible not only in design, but also in implementation."

Product positioning

Asked about the future of the triple-offset valve, Mr Aliani indicated that whilst the LNG market would remain a key sector there is huge potential elsewhere as well. "Today we sell a lot of these valves for crucial applications such as emergency shutdown use. For example, we have supplied them in Monel for use at several of Sasol's oxygen and hydrogen plants. For that order we also purchased and fitted appropriate actuators, taking responsibility for the entire unit. The customer therefore received a 'plug and play' product that had been thoroughly tested in our own facilities."

FCX Orton's triple-offset design is also starting to make inroads into applications traditionally served by ball and gate valves. Mr Aliani: "For example, in August 2004 we completed a project for a power station in Jebel Ali (United Arab Emirates) for which we supplied four 92 inch, metal-seat-

Mr Felice Lauriello, FCX International Director: "I'm glad to say that the expertise and commitment of the FCX Orton management team to develop valve products for demanding applications is replicated throughout the rest of the FCX Group."

Key Developments - FCX Orton

1963 Founded as a manufacturer of concentric rubber lined valves
1987 Initiates production of double eccentric rubber seated valves
1988 Triple-offset metal-seated valve launched
1992 Orton certified for ISO 9001 compliance
1993 Acquired by FCX International plc
1996 Relocates to larger premises
2000 Replaceable seat and seal developed for triple-offset valve
2001 Certified PED-compliant
2002 Top-entry, metal-seated, triple-offset valve developed
2003 Plant extension, including bunker for high pressure and cryogenic tests
2004 Opening of FCX Orton sales office in Houston

ed valves for steam isolation. Four years ago this application would almost certainly have been met by gate valves, but now our valve is being used instead. The client praised the seat tightness, the better operability and the control capability, amongst others. The larger sizes, particularly in classes 300 and 600, will in my opinion be the next evolution in valve technology once contract engineers realise that these valves are less expensive and more reliable than what the market has offered to date."
Mr Zirondelli adds that whilst the power industry tends to be very conservative, in the UK the top-entry butt-weld triple-offset valve is being adopted for high-temperature applications "We are also promoting the triple-offset valve for large water distribution lines in the US," he continues. "Here, engineers are realising that this technology can be used at high pressures. Our valves can easily handle 350psi or higher pressure at velocities exceeding AWWA limits."
FCX is absolutely right to stress the benefits of its triple-offset valves in demanding applications, concludes Mr Aliani. "Be it steam isolation, high temperature application, throttling, emergency shutdown, cryogenic or high-cycling application, we can easily customise different options to meet the clients' exact needs. We can even add on an actuator and a positioner, providing both control and shut-off in a single unit. To my mind, that shows how robust and versatile our triple-offset design really is." ■

FACTS & FIGURES

Name:	FCX International plc
Headquarters:	Weybridge, England
Principal activities:	Specialist distribution, niche manufacturing
Served markets:	Aerospace, Biotechnology, Chemical, Defence, Food & Beverage, General Industry, Heating & Ventilation, LNG, Mining & Minerals, Nuclear, OEM's & Contractors, Oil & Gas, Pulp & Paper, PET, Petro-Chemical & Refining, Pharmaceutical, Power & Energy, Water & Waste
Distribution businesses:	FCX Australasia (16 locations in 2 countries), FCX Europe (9 locations in 5 countries) FCX Performance Inc. (15 locations in the US)
Manufacturing companies:	FCX Orton, FCX Thompson Valves, FCX Truflo Marine, FCX Truflo Rona, FCX Newman Hattersley, FCX IMF, FCX GHR
Offices:	50 locations in 12 countries world-wide
Employees:	1000
Sales:	EUR 250 million