

Dalian DV Valve: A shining star in the Chinese nuclear industry



Of all the countries with new build plans, China is probably the most active in actually constructing nuclear power stations. The country has set an ambitious target of increasing its installed base from 10GW to 70GW by 2020, creating a huge market for nuclear valve suppliers. While several international brands have competed in this market for many years, the number of local suppliers has also grown rapidly as the industry has developed, and will eventually have the capabilities to support the country's most important projects. Dalian DV Valve, a former State-owned valve company, has received orders from many international end users for various projects including nuclear power stations, the military, chemical, shipbuilding, machinery, textile and oil and gas industries. From its headquarters in Dalian, Liaoning province in China, Board Chairman Mr Chuanqi Yu spoke about Dalian DV's history, experience and latest developments.

By Yuzhong Shen

If you look at the history of Dalian DV, you will find that in China we are a pioneer not only in the valve industry but also in the nuclear valve sector," begins Mr Chuanqi Yu, Board Chairman of

Dalian DV Valve. "Founded in 1956 under the name Dalian High Pressure Valve Factory, the company was completely state-owned and mainly focused on valve manufacturing and exporting. With

a strong focus on exports the company soon became one of the best valve companies in China. For many years the valve export business was so successful that the company didn't have enough





in China has boomed since 2000 and Dalian DV has also benefitted greatly from industry developments, factors which have provided us with a very good balance between exports and domestic business. At the moment applications in the oil and gas industry together with the nuclear industry account for most of our business."

Wide range of products

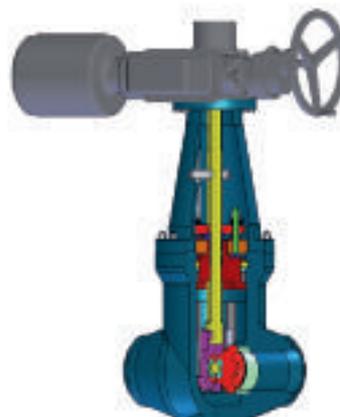
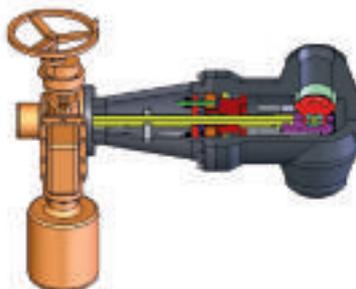
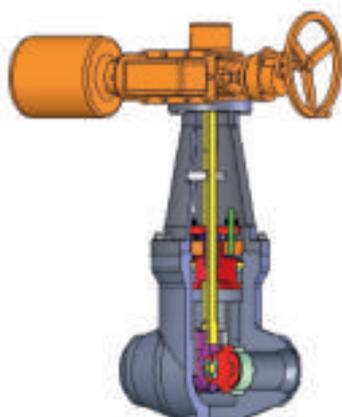
Dalian DV's products include more than 500 different models covering 20 categories of valves (see box). "Basically we divide our products into civil and nuclear applications. For normal civil use which mostly means oil, gas and water treatment, we have a number of globe/gate/check/butterfly valves at class 800Lb, 1500Lb, and 2500 Lb; these are mainly forged valves. In the international market, most of our customers today prefer fully forged valves. The fully forged valve bodies are machined from a single solid block, which has the advantages of requiring fewer checks and lowering the risk of leaks. Due to these customer demands our products for high pressure applications are mainly fully forged valves in small to medium sizes," explains Mr Yu. "In the nuclear valve area, we are the first manufacturer in China to have started development and production since 2001. We began with small size valves; however after almost 10 years of development we are now able to provide a series of nuclear valves covering small to large sizes, for example fully forged valves up to 10 or 12 inches."

In the Chinese market, many important projects have been supported by the government to encourage cooperation and product developments from local



suppliers, and Dalian DV has been a popular choice for several nuclear applications. With years of experience and R&D activities, the company has successfully developed some high end valve products which are widely used in the country's nuclear power stations. Mr Yu highlighted some key nuclear products from Dalian DV: "We are now producing a wide-bore, full-flow, forged steel swing check valve, which has a high Cv (flow coefficient) value. This nuclear grade product was developed based on customers' requirements and an investigation of similar products in the international market. It's a new design with several unique features. Similar products which we have seen before are usually of cast construction which tends to generate fabrication defects that cannot be repaired. This new product is different in that the body of the valve is of forged construction, while the inner chamber of valve body is fully machined so as to ensure a good finish. When operated, the valve disc

capacity to meet domestic demand." The company became a private enterprise when the State-owned Enterprises Reforms took place in 2002. Mr Yu continues: "The new management began to develop both the overseas and domestic markets. The valve market



Main Steam Isolation valve technical drawings



swings to reach a 64-degree fully-open position, which ensures the medium can pass through without obstruction. Our tests have shown that the valve's Cv value reaches 4696. Thus this design avoids the disadvantages of a cast valve body, while still being safe and reliable. Another feature is that both the valve seat and valve disc are overlapped with ERCoCr, a hard alloy. The hardness of the valve seating face is HRC39~43 while the sealing face of the valve disc is HRC43~47. This means that both of the sealing faces score very highly for hardness, making them more resistant to wear and erosion. They are also very corrosion-resistant, and the difference of 50 Brinell hardness between the two sealing faces results in better sealing performance."

Mr Yu revealed that currently Dalian DV is involved in an important main steam isolation valve (MSIV) project with support from the government and nuclear authorities. "The sole purpose of this valve is to protect the steam generator during the critical event of a pipe break downstream of the valve. The quick-closing MSIV is required to close within 5 seconds once a pipe break is detected, to protect the steam generator. This is

of course one of the most complicated valves to make, and must be produced to the highest standard. We have completed the valve design and the castings are in production. It's now at the final stage and is awaiting approval by various authorities and engineering institutes."

Qualified for the global market

Dalian DV is actively seeking business opportunities in the international market. Mr Yu continues: "For the past few years we have spent a great deal of effort and resources on obtaining various certificates which we consider a necessary step for us to access the international market. The result is that we are very proud to be the first Chinese valve company to get the ASME 'N' and 'NPT' stamp, which means we are qualified and capable of providing nuclear valve products and nuclear valve accessories to the international market. For example some of our nuclear valve products have already been used in some nuclear projects in Pakistan. We also obtained the API 6D and PED certificate a number of years ago. In China, Dalian DV is the only valve company to have obtained such a nuclear valve manufacturer certificate from both international organizations and local

authorities. When it comes to the overseas oil and gas projects, we mostly work with various international EPC companies; however we have also been included in the vendor list of some top end users from US and Europe, which allows us to participate in their important projects worldwide. At the moment the biggest overseas market for us is North America, where we have both direct sales and OEM business."

Benefitting from the country's fast growing economy, more than 60% of Dalian DV's business is currently in the domestic market. Mr Yu: "Since 2000, our nuclear valves have been widely used in almost all the nuclear power stations in China, from the earlier projects such as Tianwan and Qinshan to newer projects including Hongyanhe, Dayanwan, etc. For the Chinese domestic market we are fully certified for nuclear valve design and manufacturing activities covering nuclear Grade 1 and Grade 2. The government authorities have also included our company in a supplier list that will support the localization activities of critical equipment, for example some critical nuclear valves. For some nuclear valve products we are the only local suppliers competing with international brands.



A 48" fully welded ball valve.



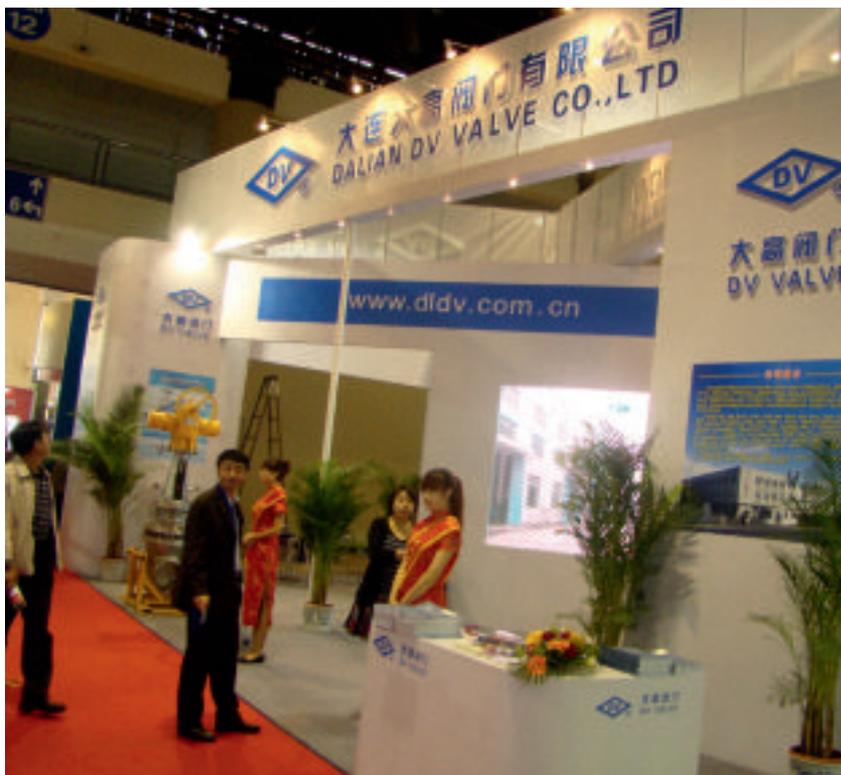
A DN150 Class 1500 forged gate valve.



Meanwhile in the oil and gas industry we are among the very few local suppliers to have been certified to manufacture fully welded ball valves designed for high-pressure, large bore applications in the West-East Gas Pipeline Project.”

R&D and quality focus

Mr Yu reveals that the company has had a focus on quality from the very beginning of business. “We make very large investments in our R & D activities every year, mainly targeting nuclear valve products and fully welded pipeline ball valves. We’ve also imported a highly efficient drilling machine which can finish the machining of a valve body or bonnet from forging blank to finished product within 15 seconds. Thus our production capacity for forged steel valves has grown from 800,000 to 1 million pieces annually. In order to guarantee the quality of products, we have full control of the entire production process, from raw material processing in our own foundry, to final machining and assembly. Each order of material comes with a unique ID, from which we can easily determine where and when it was imported in case problems arise. Of course nuclear valves are more special than normal products and require extremely reliable performance. To achieve this quality standard the design and manufacturing of valves needs even more thorough quality checks and closer attention. In the nuclear power stations currently operating in China, only 4% of the nuclear valves are from local suppliers. For years Dalian DV has been working on the nuclear valves localization project, and after a long period of design and testing, we have successfully passed the reliability test for 12 models of nuclear valves, which is considered significant progress



Every year Dalian DV takes part in international exhibitions.

in the local industry. The Chinese Premier Mr Wen Jiabao has visited our plant and the Company President, in recognition of our great contribution to the Chinese nuclear industry.”

Discussing the future plans for Dalian DV, Mr Yu says that the company will maintain its focus on nuclear valve products and some high-end pipeline ball valve products. An expansion plan has already been drawn up to increase production capacity for both the nuclear valve factory and the forging foundry. Mr Yu: “We have already reserved land for building a new factory nearby area in Dalian, which will be 3 or 4 times larger than the current one. Another valve factory in Jiangsu province has also

started operation, and that facility will mainly focus on valve products for oil and gas pipelines. This demonstrates how we are actually separating the manufacturing lines for nuclear valve production from other lines, which will bring about more stable and guaranteed quality for every product. In the international market, Chinese valve suppliers still need to work hard to earn trust from customers, especially in the nuclear valve area. We would like to invite all potential customers to come here and visit our plants. I’m sure they will eventually find out that we can do a really good job.”

Facts & Figures

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| Name: | Davian DV Valves |
| Founded: | 1956 |
| Headquarters: | Dalian City, Liaoning Province, China |
| Capacity: | 800,000 sets of valves/annum |
| Key industries: | Nuclear, petrochemical, ship building, electric power, metallurgy, machinery, textile, military, etc |
| Turnover: | RMB 600,000,000 (EUR 62.1 million) |

Dalian DV’s products include more than 500 different models covering 20 categories of valve including Gate Valve, Globe Valve, Check Valve, Throttle Valve, Ball Valve, Plug Valves, Butterfly Valves, Steam Traps, Instrument Valve, Regulating Valve, Bellows Valve, Flat Gate Valve, Vacuum Valve, Low/Ultra Temperature Valve, Anti-sulfur Valve, Y-valve, Nuclear Grade Valves, Military Valves, Special Valves and pipe Flange, Valve Operating Mechanism, etc.

