Welcome to uptime with Metso's control valves

(left to right) Vesa Lempinen, Sari Aronen, Mika Nissinen, and Jari Kirmanen.

Under the company's strategy, published in July 2014, Metso decided to focus more on mining, oil and gas, and aggregates industries. In Metso's flow control business the target is to become a leader in flow control within the oil & gas and mining industries. An important step in implementing a more focused outlook was taken when the company decided to divest its Process Automation Systems business to Valmet Corporation and this transaction was completed in April 2015. Valve World took the opportunity to meet with some of the Metso Flow Control management team at the Metso Valve Technology Center in Helsinki, Finland, to talk about the most recent changes that have taken place. Mika Nissinen, and his colleagues Jari Kirmanen, Vesa Lempinen and Sari Aronen, shared with us what the changes mean for Metso.

By Christian Borrmann

The company aims to strengthen its market position by expanding valve, pump and valve controls offering to oil & gas and mining customers. Today Metso enjoys a good position in oil and valves but we understand that the company's ambitions are high. In addition Metso continues to offer its valve solutions for the pulp & paper, power and other process industry customers.

"The new strategy has brought us more focus and a clear mission in the flow control business", says Mika Nissinen, Vice President of Oil and Gas control valves. One of the selected growth areas is the control valve business in Oil and Gas related industries. "In my area of responsibility this is really good news and we are more than excited about the opportunities our new product portfolio brings to us".

Mr. Nissinen is referring to the latest Metso acquisition in the valve field: In 2012 Metso acquired a globe valve product line from South Korea which is now serving the global market. "For many years our customers have been asking for globe valves with the same quality and reliability as our rotary

New Globe Valve Technology Center in South Korea

Metso's new Neles® Globe Valve Technology Center in South Korea with its modern processes ensures high-capacity and high-quality production and delivery of globe valves for oil and gas and power customers locally and globally. The plant is located in Chungju city, about 120 km southeast of Seoul.

"There is a growing demand for reliable control valve technology and engineering know-how, globally. We at Metso are continuously developing our operations to strengthen our position and to better serve our customers. Our new globe valve center is ideally located in the growing Korean market in the midst of Korean EPC companies that play a key role in many projects worldwide," says Markus Hauhia, Director, Globe Valves, Metso.

The technology center features component manufacturing, a flow testing laboratory with a state-of-the-art cryogenic test facility and engineering services. The new center's research and development, customized engineering, and sales, services and administration activities support Metso's ability to engage in comprehensive and efficient cooperation with its globe valve customers.

Recent applications of Metso's globe valve technology include Abu Dhabi Oil Refinery Company's (TAKREER) chemical refining complex, a geothermal power plant for Zorlu Energy Companies Group in Turkey and the world's biggest pulp plant, PT OKI Pulp & Paper Mills, to be built in Indonesia. Moreover, numerous Korean oil and gas, power, and pulp and paper customers rely on Metso's globe valves. Metso is a value-adding partner for all project key stakeholders, including operators, engineering, procurement and construction contractors, and original equipment manufacturers. Metso has delivered valve technology and engineering know-how to more than 100 projects led by Korean EPC companies.

control, ball and butterfly valves. We are happy to say that Metso now has a globe valve solution to fulfill that need."

Metso has been famous for its rotary control valves over several decades. During this time Metso has reached a strong position in several industries and now the portfolio is completed with a linear valve technology product line. Neles globe valves offer an innovative and fundamentally simple construction with excellent operational and maintenance features to optimize and secure process performance at the lowest price level. Metso's offering is truly massive. All the control valve technologies in linear and rotary configuration, all the actuator options, intelligent valve controllers, severe service trims and decision making software support are available from one location.

In addition to the new globe valve series, Metso has brought new enhancements to its rotary control valve offering. The 30 year old Q-trim technology has been boosted with second generation trim technology Q2-trim which sets the bar at a new level, reducing the noise up to 30 decibels compared to typical control valve. A selection and sizing tool NelProf now includes all Metso's control valves and a new revision was launched in May 2015. "This is a great tool to ensure that you are able to select the best-fit control, on/off or safety valves to the given process conditions. We are a one stop shop for our customers", says Mr. Nissinen.

Demanding conditions and fitting solutions

The valves in a petrochemical or refinery process must withstand significantly demanding process conditions, such as high pressure and temperature, toxic and corrosive fluid, vibration and pressure shock under

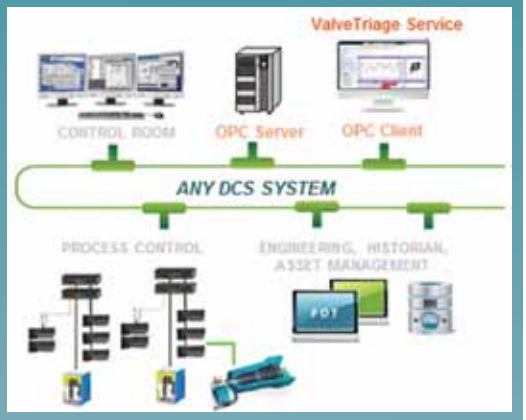
ValveTriage Service manages instrumentation and control valve performance by process data analysis

Jarkko Räty, Manager Pulp & Paper Solutions at Metso Flow Control

Control valves and measurement instruments are critical pieces of equipment in industrial processes. Problems in these make the rest of the process suffer. Right targeted maintenance actions are crucial in maintaining adequate process performance. Known condition of control valves and instruments can be utilized in maintenance planning to focus actions to the devices most needing attention.

Traditional ways to diagnose control valves and instrumentation have either been by analyzing the digital valve controller's and instrument's device information or by testing and analyzing with portable testing tools. Metso Flow Control Services introduces ValveTriage Service, a new way to evaluate the device condition and performance utilizing process information. This is especially tempting for plants not having modern digitalized device technology with associated systems or possibilities and resources for the portable testing.

Control systems are gathering real-time data from all corners of the plant. The data can be stored and used to analyze condition and performance of field devices. With ValveTriage Service the process data can be turned into meaningful diagnostic information. The service system runs 24/7, gathering data from the control system via OPC interface. It calculates several diagnostic measures bringing up the devices needing attention. Typical diagnostic measures for control valves are excessive valve travel, oscillation due to valve stiction or hysteresis and valve sizing issues. Respectively, data losses, instrument at limits, noise levels, spiking and flat-lining are followed in case of measurement instruments.



ValveTriage Service does not need any extra instrumentation in the field. It communicates with any DSC system via OPC server.

A great advantage of real-time metrics and diagnostics calculated from process data is that they can quantify the extent of the problem and its effect on the process. Rather than saying there is "some stiction" on a valve, an exact number, such as 4.2% stiction causing 2.1% variation in the process value, is supplied. This gives far more value than a "true/false" diagnostic and severe problems will receive much higher priority. The prioritization gets even more valuable when the real-time metrics are combined with a device's criticality class information, i.e. the device's impact on process, safety and the environment. ValveTriage Service's findings and maintenance proposals are reviewed with the customer's maintenance representatives in order to define and prioritize maintenance actions.

A typical behavior of sticky valve detected by ValveTriage service. Flowrate stays at the same level even if the control action for valve opening is going down. When the valve finally moves, it moves too much and the control system wants to open the valve. This behavior goes on 24/7 increasing process variations and causing excessive wear and tear for the valve.

The focused actions greatly reduce time spent in the field, working on wrong problems, freeing up skilled personnel to resolve the right issues and to spend time on higher-level tasks. As the number of maintenance activities go down, not only does the cost of maintenance fall, but it also makes the plant safer resulting in fewer events for potential faults and accidents. The ValveTriage Service delivers bottom-line results, by focusing attention to the worst behaving devices. Lifetime of equipment is extended by early detection of excessive wear and tear and process performance is enhanced by bringing down process variations.

Finding the way to control precision

Sari Aronen, Application Manager, Oil & Gas

Chemical and petrochemical producers face ever-increasing regulatory, environmental and performance demands. Now, more than ever, deep application knowledge and application-specific technologies are required in order to select control valves that are just right for the application and helps keeping the engineering and operational costs at a reasonable level.

Furnace fuel gas control is a good example where accurate, reliable control valves play a significant role in reducing operating costs. Proper combustion maximizes heat transfer, which minimizes fuel gas consumption and related costs. Variations in fuel gas composition and different operating conditions at start up, normal operation and shut down means that such valves must control various loads, which requires a wide rangeability from the valve. This is typically solved by using a split range configuration with globe valves. Another method is to use rotary control valves with a wide rangeability, such as V-port segment valves. In this way, the wide rangeability allows accurate control with both small flows and large valve openings with a single valve solution.

Sari Aronen explains that "there's no right or wrong way to design your fuel gas control method from the options presented. The most important is to decide what works best for the plant in question and weigh up the pros and cons of engineering, piping costs, inventory management and daily operations. Partnering with a valve supplier that can provide a variety of reliable solutions to meet the specifications and, more importantly, can help to find the right solution for your plant and your case is the key to success."

(left to right) Jari Kirmanen, Vesa Lempinen and Sari Aronen discuss the inside details of Metso's second generation trim technology, Q2-trim.

normal service conditions, and they must meet all safety requirements. "Our mission is to bring sustainable products to the market which maximize the plant uptime with an attractive price level while fulfilling all safety or environmental requirements."

"After the globe product line acquisition, we continued our investment in South Korea and a new globe valve technology center was commissioned at the end of 2014. It is ideally located in the growing Korean market amongst Korean EPC companies that play a key role in many projects worldwide", Mr. Nissinen states. Metso has invested a lot in the last 5 years to its global footprint and today, as reported after our last visit to Helsinki in 2011, the company has a total of eight valve technology centers around the world. A valve operations network is geographically widespread and includes world-class valve production facilities located in Finland, Germany, China, South Korea, India, Brazil and two facilities in the United States. Over the last few years, Metso has resolutely expanded and developed its valve production facilities and now its extensive flow control services offering covers business solutions and services that optimize equipment use and cost of ownership. Today, Metso has more than 40 valve and field device service centers worldwide. "Our operative model is very unique and enables good service levels to our customers. In 2015 we will open six new service centers globally", adds Mr. Nissinen.

"Our customers make our success. Products are only one part of the success story. You need to have skilled people, tradition, and a culture of serving the customers without compromise. It is our way, the Metso Way, which makes the difference to our customers", Mr. Nissinen concludes.

Knowledge, People and Solutions

Process uptime, safety and productivity are what typically count when speaking about different industrial processes. Correctly selected process control valves greatly support uptime, safety and productivity targets but also help to minimize the maintenance costs and time. Metso have all the required capabilities to help customers in both general and even the most demanding control valve applications, now even better than ever. Application based valve selection and knowledge combined with Metso's extensive and field proven control valve products provide the most attractive solution from both an end user and an engineering company perspective.

Mr. Lempinen points out, "The key to successful control valve selection starts from application and process information. The control valve type will be selected based on application requirements, keeping in mind also the economics and total cost of the valve ownership. During the early phases of valve selection process critical or severe applications requiring special care should be identified. Correct control valve selection leads also to lower maintenance costs and returns significant benefits from a process controllability point of view.

"One of Metso's key values is demonstrating that, at Metso, we succeed through the success of our customers. We want to streamline our tools and processes up to the level where selecting and buying Metso control valves is as easy as possible. We want to be close to our customers to understand his/her challenges in order to find solutions, creating also values other than just supplying high quality and reliable products on time. These services may help him/her to optimize plant design or simply save his/her time during the project," explains Mr. Kirmanen.

He continues, "In addition to expanding our product portfolio and delivery capability our new strategy puts more focus on strengthening our capabilities to serve our customers during the design phases of the engineering projects. Providing services such as in-house engineering, we want to help our customers to meet his/her project KPIs."

Metso's global organization takes care of supporting the customer during the complete life cycle of the control valve. Dedicated project teams together with global sales and service capabilities ensure seamless operation and support from the early phase of the engineering project right through to start-up and beyond during the operational phase of the valves.

"Engineering companies and end users encounter challenges to meet commercial and technical requirements within shorten time frames and with limited resources of evermore complex projects. As a valve vendor we should ask ourselves what we can do to help our customers and make their life easier", Jari Kirmanen and Vesa Lempinen are Global Business Managers, Oil & Gas Control Valves.