



Located in the heart of Germany, valve manufacturer Schroedahl-Arapp has an impressive track record of serving the nuclear power generation industry. Hardly surprising, perhaps, as its control valves and automatic recirculation valves possess some excellent features necessary for this application. Since its foundation in 1962, the company has supplied more than 1000 of these valves to (nuclear) power plants and more than 45,000 to other industries. We traveled to Germany and met with the company's International Sales Manager, Mr. Ralf Loehe, to find out more about this high-tech company.

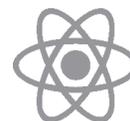
## Schroedahl-Arapp: a valve specialist for high-quality applications

By Esther Martensen

Few valve companies can boast such an impressive portfolio of clients in the nuclear power generation industry as Schroedahl-Arapp. For the new European Pressure Reactor (EPR) Olkiluoto 3 in Finland, for example, the company recently won an order for about 100 control valves. Placed through Framatome, the order is for the planning, manufacturing and delivery of control valves for the nuclear island for Olkiluoto 3. For the same project, this time through KSB (Germany), Sulzer (Germany)

and David Brown Guinard Pumps (France), Schroedahl also won orders for the delivery of pump protection systems for the main feed water and condensate system of the reactor. Elsewhere in Europe Schroedahl-Arapp is in discussion to supply and has quoted products for the Flamanville project in France. The company is also set to deliver products to the Cernavoda plant, a CANDU engineered nuclear power plant in Romania. However, Schroedahl-Arapp is any-

thing but a European-focused enterprise. Mr. Loehe: "We do not limit ourselves to the European market. We are currently in discussion with Mitsubishi Heavy Industries in Kobe, Japan, for example, who want to use our automatic recirculation valves for their nuclear power plants as well. And, like all suppliers to the nuclear industry, we are very interested in China, where many nuclear plants are currently on the drawing table or under construction."



### Re-emergence of nuclear power

It is obvious that nuclear power generation is indeed a market that Schroedahl-Arapp is very capable of servicing, and with the apparent re-emergence of nuclear power in Europe, through the new European Pressure Reactor (EPR), the company hopes to further consolidate its position in this market, as Mr. Loehe underlines: "The EPR project is important to us because it signifies the rediscovery of nuclear power as a viable source of energy in Europe. After the Chernobyl disaster in 1986, all over Europe and especially in Germany, nuclear power was no longer considered an option and there simply was no business left in this market segment. Up to that point Schroedahl participated in just about every major order for nuclear power plants through Siemens/KWU but after Chernobyl we shifted our focus to conventional power plants and other markets, such as the petrochemical industry. And although we certainly do not want to step out of these markets, with the renewed interest in nuclear power in Europe and beyond, we would like to emphasize our commitment to this market, one we can service extreme-

ly well, and one we have never stopped to supply spares and services for all these years. Schroedahl has established itself as a reliable manufacturer for high-quality products in this market and is proud to support the new EPR technology with its knowledge in valve design." And while a lot of specialists in nuclear technology have disappeared due to the reduced nuclear business, Schroedahl still has a highly educated quality and design management, which is needed to fulfill the special requirements of the nuclear power generation industry of today. The company is certified for nuclear products that must be designed according to the KTA- (IAEA 50-C/SG-Q) and RCCM- standard and also has the capability to follow ASME-regulations.

### Severe service control valves

One product Schroedahl-Arapp supplies are severe service control valves, such as high pressure feed water control valves which control the main power of a plant, and high-pressure reduction valves. Out of the 1000 control valves Schroedahl has supplied for nuclear power plants, about 90% are used for pressure water reactor systems. The new Olkiluoto 3 EPR, which is a combination of the latest German "Konvoi" pressure water reactor design and the French N4 technology, will use control valves from Schroedahl for the nuclear island. Mr. Loehe: "Schroedahl has always supplied this package and therefore we are very pleased to repeat history and

be a strong partner for the nuclear technology of the future."

The range of Schroedahl products for nuclear service starts with small valves of size 1" (DN 25) for low pressure condensate service, and goes right up to bellows sealed multi-stage motorized control valves for demineralized service in sizes up to 16" (DN 400) and also includes the HP Reducing Station for the reactor coolant system, where the working pressure is about 230 bar. Another example of the company's capabilities are the primary water (or IRWST water) control valves for KKS - JNA service the company has designed for the Olkiluoto 3 project. What is special about these valves is that they maintain their stability, integrity and operability during and following an earthquake, including their leak tightness in case of a switch off failure by the electric actuator. >>



Through its wide product range, Schroedahl Arapp services the conventional and nuclear power generation industries and the processing industries.

### Control valves

Schroedahl-Arapp supplies control valves of all common sizes to the entire power generation sector as well as the process industries. The product range comprises nominal sizes of DN 1" (25) to DN 60" (1500), in all pressure stages from PN #150 (25) to PN #4500 (640). The valves can be actuated with all drives available on the market. All body materials required are available. The control valves are designed, dimensioned and manufactured exactly to customer requirements. Computer programs optimize the design and manufacturing processes.

The quality of Schroedahl-Arapp's products is ensured according to DIN EN ISO 9001 and they are certified by the Technical Inspection Agency (TÜV). Almost 3500 control valves from Schroedahl-Arapp are in service throughout the world.



### Automatic recirculation valves

Another product Schroedahl-Arapp has developed for applications in conventional and nuclear power generation is its automatic recirculation valve, or ARV, a pump protection system for centrifugal pumps. The company is one of the market leaders in this product, Mr. Loehe says, when he explains how this valve works: "The ARV is a piece of equipment that springs into action whenever the flow to the system or process is reduced or cut off. It is placed directly on the discharge flange of the pump. If the process flow falls below a pre-specified minimum, it will keep the pump from running hot and prevent cavitation by continuously circulating a moderated amount of fluid through the bypass line, thereby protecting the system."

It may be obvious that the designers at Schroedahl-Arapp have gone through a lot of trouble to ensure

the AVR offers long-term reliability.

"The ARV may be called upon to operate 100 times a day, or it may sit idle for months at a time. Whatever the interval, the plant operators rely on the AVR to work perfectly every time it is needed. Basically, we have developed a piece of equipment that can be installed and then forgotten."

It is understandable that new clients may be a bit hesitant about the ARV because they cannot see exactly what is happening inside. That is why the company is now making a lot of effort to promote the product, explaining to customer in detail how it operates. It is also developing a system to provide feed-back information from the bypass system.

"But strictly speaking our system is fail-proof, which, of course, is paramount in nuclear power plants. Basically, you put it on the pump and you don't have to think about pump protection any more. In addition to this, the ARV is also a very

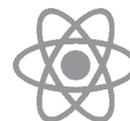
cost-effective solution, in terms of purchase, maintenance and service costs, especially taking into the consideration the possible costs of down-time due to a broken pump when there is no direct replacement available."

Schroedahl-Arapp can supply the ARV in pressure classes up to 640 bar. Although such pressures are not (yet) required in nuclear power plants, they do indicate that the AVR can be installed not only for the feedwater and condensate service, but also on, for example, high pressure offshore sea water injection systems.

### Confidence in the future

It may be clear that Schroedahl is a company that aims to offer highly specialized products designed for highly specified applications. As such, it is not a fabricator that keeps a large stock of finished products; instead, its clients are served with customized solutions. Mr. Loehe: "We don't supply mass products but we design our valves from scratch. We start by looking at the data sheet for the particular application that it is needed for and design everything around it. The seat diameter will be created anew, the numbers of stages are new, all designed around the data supplied by the customer. This by no means limits the size range of our valves. Our own machines can machine parts up to 1.2m and should larger sizes be necessary we can easily outsource."

For the cage trim, the company uses its own special technology, a perforated cage trim with 4mm holes, a Vortex system, or a special Cascade trim technology. According to Mr. Loehe, this perforated cage trim technology is not available elsewhere. "To my best knowledge, no other company goes through these efforts when machining their parts. Using this



technology, we can get the best characteristics and guarantee the lowest possible noise levels.”

Mr. Loehe therefore looks forward with confidence when asked about Schroedahl-Arapp’s future. He foresees great potential for the ARV valve, the control valve and Schroedahl-Arapp as a whole in the field of nuclear power generation. “We have an excellent quality department plus the know-how and year-long experience to service this market extremely well. Predictions are that the nuclear market will re-emerge and we are ideally placed to handle the most demanding specifications, perform unlimited testing and supply the high-integrity valves this market needs.” Schroedahl-Arapp will grow in conventional power plants and other applications as well, he foresees: “Our turnover is increasing as is our manufacturing capacity. We have built one new hall last year already and another will be added by year-end, but even then we will be in need of extra work-space. So I can say that we look forward to the future of this company with confidence.” ■

#### **Automatic recirculation valves**

The Schroedahl automatic recirculation valve combines 3 main functions in one shell:

- automatic recirculation flow for pump protection during low load conditions and pressure reduction in the bypass during recirculation
- non-return function to protect the pump against backflow from the system
- the t-piece for the recirculation piping



Typical fields of application for the ARV are to be found where liquids are conveyed by pumps such as (nuclear) power stations, the processing industries, and the petrochemical industries and offshore industries.

The ARV meets the requirements for automatic circulation in all types of systems. Benefits include:

- low installation and maintenance costs
- safe pressure reduction in the bypass with regard to cavitation and erosion
- individual adaption to the pump specifications
- few wear parts
- service-friendly

## **About Schroedahl-Arapp**

For over 40 years Schroedahl-Arapp has been one of the leading suppliers of specialty valves for the power generation industry (conventional and nuclear) as well as the processing industries. The company offers consulting, engineering, shipping, installation, commissioning, maintenance and conversion services, all from one source, nationally and internationally. The valves are produced using ultramodern CNC machining centers which ensure high quality and accuracy. All-round customer service is available on a worldwide basis, 24 hours per day.

Schroedahl-Arapp’s main office is in Reichshof-Mittelagger, Germany. Sales offices can be found in The Netherlands, Germany, and Houston, Texas, USA and sales representatives can be found world-wide.

The quality assurance of Schroedahl valves is based on the high quality demands of the German and foreign approval authorities for nuclear power stations. The company meets all specifications according European and foreign regulations and standards such as ASME (ANSI).

For more information: [www.schroedahl.com](http://www.schroedahl.com)