

VAG valves help to secure water supply to Metsä Fibre bioproduct mill in Äänekoski, Finland

The new Äänekoski mill was commissioned on August 2017 and it is the first next-generation bioproduct mill in the world. Its annual pulp production capacity is 1.3 million tons. In addition to high-quality softwood and hardwood pulp, it is producing a broad range of other bioproducts.

A network of companies will broaden around the bioproduct mill. These companies will convert pulp production side streams into new bioproducts that offer higher added value than before.

Because the new mill needs large amounts of water for its production, also a raw water pipeline and pumping station was built to serve the mill. The pumping station's capacity is 10 m³/s and it provides all the water used by the bioproduct mill.

Securing the operation of the pumping station in all conditions is very important, because it delivers all the water directly to the plant without any buffer tanks. The critical nature of the station imposed great demands on the planning stage.

The pumping station had a complex pipe layout and thus a very challenging hydraulic situation. Especially possible backflow needed to be controlled and the re-start of the plant needed to work quickly and without any manual labor. Special VAG valves to avoid water hammers and vacuum inside the system were installed to overcome these challenges.

"During the planning stage, we took care that the critical nature of this pumping system was taken into account with e.g. precise control systems, backup equipment and doubling the power supply. We chose all the equipment for this project based on reliability and proven references. VAG was clearly the best choice for valves." says planning manager Joni Heino from Focusplan Oy.

In a challenging project, it is a clear benefit, that all parties work closely together to obtain the right technical solution. According to Joni Heino, the expertise of VAG and their Finnish partner Tecaflow was evident from the first meeting and that is why they were trusted with a big responsibility for the valve selection in this project. They were closely involved in the project and helped to design a plant which operates with the highest safety, reliability and efficiency.

The valve solution consisted mainly of three product groups:

Customized VAG air valves were installed in combination with Duojet to avoid vacuum by the increased air admission capacity of the valves. Due to the reduced air release capacity, the air valve limits the filling velocity and can contribute to avoiding water hammers in the system.

Non-return valves allow the plant to operate in the most efficient way, since they are creating very low losses and allow the operation with low flow velocities. Additionally, with its fast closing and the integrated damping unit, the valve contributes to the plant safety by avoiding water hammers even under critical circumstances.

The pressure sustaining valves are starting to react when something unexpected happens. In case of a sudden stop of the water flow, the valve will open and release overpressure to protect all the system components.

Raw water pumping station

6 pcs	DN900	VAG EKN Double Eccentric Butterfly Valve
6 pcs	DN900	VAG SKR Slanted Seat Tilting Disk Check Valve
2 pcs	DN300	VAG Spring-loaded Air Valve With Anti-surge

Raw water pipeline

10 pcs	DN200	VAG Duojet Air Valve
10 pcs	DN200	VAG Zeta Knife Gate Valve
2 pcs	DN300	VAG Pico H Pilot Operated Control Valve

TecaFlow

"We were very grateful to be involved during the planning stage. We were able to contribute with our know-how to overcome all valve related challenges early on. After analyzing the situation with all the involved parties, we performed several calculations to define the right valve sizing and installation locations. Those calculations could be implemented by the planner into the water hammer analysis. To perform all required calculations, we could benefit a lot from all our experienced colleagues in our VAG Consulting and Design departments. Because of their know-how, we were able to adapt 145 years of valve manufacturing experience into one project. This allowed us to choose the correct valve for each installation situation individually" explains Professor Anton Rienmuller from VAG GmbH.

"I want to thank both VAG and Tecaflow for their input during this project. I never felt they were only trying to sell us valves. Instead, they were giving us a complete service, which enabled us to succeed together. Now that the plant is in operation, everything is running as smoothly as it should" concludes Joni Heino.

