

PROGRESSING CAVITY PUMPS IN POWER PLANTS



Heimbach is Germany's most beautiful Art Nouveau power plant and is kept in its original condition.

The operating principles and overall design of progressing cavity pumps make them suitable for universal use. One of their fields of application is the pumping of abrasive liquids that may contain solids, but also fibers. Sludges in sewage plants are one example. These pumps are also well-suited to metering. They generate a consistent and pulsation-free flow even when faced with fluctuating working pressures and liquid consistencies. Gentle pumping action, with low turbulence and minimal mixing of the pumped liquid, is another identifying characteristic of progressing cavity pumps. This is why progressing cavity pumps constructed of stainless steel are also used in the food, beverage, and cosmetics industry. But gentle pumping is important in other fields of industry as well. Power plants, for example, contain applications where this characteristic is essential.



Information panel at the entrance to the power plant.

Progressing cavity pumps at the Heimbach power plant

The Heimbach hydroelectric power plant in the North Eifel region is one of the oldest still-operating hydroelectric plants in Germany. Originally constructed in 1905, it was completely renovated in 1974/1975 and converted to modern technology. The eight original turbine groups with 12,000 kW of output were replaced by two new machines that generate 16,000 kW. In 2011, the machines and technical systems were renovated and modernized.

Elevated requirements for environmental protection led to another round of modernization in 2012. Until then, centrifugal pumps moved cooling and sealing water in the discharge channels through an oil trap and into a reservoir and then into the Ruhr river. Centrifugal pumps are generally well suited for pumping clean water. However, oil and water tended to emulsify during this special pumping task. During regular operations, this was not a problem. There was plenty of time for the oil/water mixture to collect in front of the oil trap, causing the emulsified oil to re-float. However, in the event of damage, if large quantities of oil escaped from the coolers, the oil traps would be unable to clean the emulsion

quickly enough and well enough. Due to these safety considerations, environmental regulations now require the use of low-pulsation and low-turbulence progressing cavity pumps in this process.

Allweiler® progressing cavity pumps

As operator of the power plant, RWE Power AG selected progressing cavity pumps of the "Allweiler" brand. Allweiler® belongs to the CIRCOR business segment of the American CIRCOR Corporation. For more than 50 years, the Allweiler® plant in Bottrop, Germany has specialized in production of progressing cavity pumps in many sizes for use in a wide variety of operating and pumping conditions. This plant is one of only a few manufacturers that manufactures all of its own rotors and stators. With access to more than twenty different materials, CIRCOR Fluid Handling Allweiler brand can adapt its pumps to specific liquids and thereby maximize service life. The new elastomer mixture "ALLDUR®" extends service life of the stator by as much as three times over conventional mixtures.



CIRCOR Fluid Handling Allweiler brand progressing cavity pump



A portion of the early control panel.



According to Frank Winkens: "The pumps have fulfilled all of our expectations. They have been in operation 24/7 since 2012 without disturbance."

Reliable and ready for the future

At the Heimbach and Schwammenauel power plants, two pumps of different sizes from the AEB1F series replaced the older centrifugal pumps. The pumps are frequency-controlled and move between 500 and 700 l/min at a speed of approximately 200 1/min. Depending on the volume of cooling and purge water, they are in operation approximately every 15 minutes. Since their installation, there have been no disturbances, nor any need for maintenance. "The pumps have fulfilled all of our expectations," according to Frank Winkens, the manager responsible

for pump engineering at the power plant. The manufacturer expects the pumps to stay in operation for another 20 to 30 years without requiring external interventions.

With frequency control, the pump units can be controlled with precision, but their benefits do not end there. Considering the possibility that the power plant may have to pay for its own power consumption in the future, the pump units are also a secure investment.



One of the old machine sets that was in operation from 1905 to 1974.

Delivery, installation, and commissioning from one source

The power plant considered proposals from several different manufacturers before reaching a decision. Allweiler®'s ability to combine high quality with a reasonable price was the decisive factor. "We have been using pumps from this manufacturer in many of our other plants and have had only positive experiences," according to Mr. Winkens. The proposal from the company Klump (Allweiler®'s local dealer in Brühl) to not only deliver the pumps, but also to install them and bring them into operation was another important consideration.

FOR MORE INFORMATION VISIT:

www.circorpt.com

Power Generation Products & Services

ALLWEILER® HOUTTUIN™ IMO® WARREN®

CIRCOR, ALLWEILER, IMO and WARREN are registered trademarks and HOUTTUIN is a trademark of CIRCOR International or its subsidiaries in the U.S. and/or other countries. ©2018, CIRCOR International. All rights reserved. GB-PG001-24855-5/18

