

Pump challenges in phosphates

A major mining group in Morocco, one of the leading companies in the world market for phosphates and its derivatives, operates several large production sites and chemical complexes. At one of its sites ABEL says its reliable HPT triplex plunger pumps are used for gland seal water supply. The slurry pumped from the mine is stored in various high volume tanks for subsequent distribution to the 10 independent production units. In order to ensure non-stop pumping, the mining company has 10 pumping lines and another five in reserve. The product is pumped by different centrifugal pump series on each line. Each series is made up of one, two or three centrifugal pumps depending on the pumping characteristics (flow, pressure) required on each line. At present there are over 40 centrifugal pumps with variable flows and maximum limits close to 300 m³/h and maximum pressure limits of 30 bar.

In order to ensure the mechanical sealing of the centrifugal pumps, a precise amount of water is needed in each pump to clean and cool the seal. The water flow in each sealing action should cause pressure of approximately 0.5 bar above that of the centrifugal pump impulsion. "It must be borne in mind that as the seals wear out, the water supplied to generate the required pressure must be greater, apart from the pressure variations in each centrifugal pump depending on the features of the pumped product and its flow."

Another important aspect of this application to be taken into account is the fact that each triplex HPT ABEL plunger pump will supply the flow needed to carry out the correct sealing for up to a maximum of six centrifugal pumps at the same time.

"All these variables have made the mining



HPT triplex plunger pumps from ABEL are being used for gland seal water supply

customer opt for the robustness of the ABEL model HPT positive displacement pump, which apart from being highly reliable offers great precision in the water flow supplied to the pump at every moment. Each HPT pump is capable of adjusting to a range of highly different flows by modifying the speed of the motor and therefore the pump strokes via a frequency converter – VFD."

In total, 14 ABEL model HPT pumps were supplied for this project; seven for operation and seven on standby to ensure mechanical sealing of the whole inventory of centrifugal pumps for distributing the phosphate slurry to all the production units.

With the objective of standardising the process as much as possible, a sole pump was chosen with small differences in its settings. The equipment chosen is the HPT- K-32 model, which allows for a maximum flow of 30 m³/h and maximum pressure of 30 bar. Apart from simplifying operations, a sole pump reduces the stock of spare parts needed.

Following ABEL's manufacturing philosophy of seeking maximum equipment reliability, the

robust HPT pump head is constructed of forged steel. The pump has all the following safety features: safety valve, complete protection for drive belt, reducer oil level control, piston leaks detector and no-load detector, "always ensuring the equipment is in perfect working order."

Cited advantages include the following:

- Only one pump required to service multiple centrifugal pump seals.
- High reliability and robust pump design for 24/7 operation.
- Safe and quiet operation
- High precision in flow control to respond to the water demand at every moment.
- High precision of the supply flow
- Low operating costs.
- Excellent energy efficiency
- Low maintenance cost
- Low consumption of spare parts
- Easy access to worn out parts in maintenance operations.