

Case Study - Mine dewatering pumping systems



Project description

Metso Slurry Pumps along with ANM Equipment and Miller Engineering have recently supplied eight HM150 Orion Series horizontal pumps for a unique mine dewatering application.

Study highlights

ANM is Metso's pump distributor located in Tucson, Arizona with an excellent facility to fabricate and assemble pump skids and accessories. Miller Engineering (the engineering arm of ANM) provides the engineering expertise to design skids, motor bases, guards, piping systems, level control and electrical interface. Over the years this combination has been very successful with the design of portable skid mounted pumping systems for underground mine development and tunneling projects.

This project was initiated in 2001 to engineer an underground pumping system for a mine decline development in Ontario, Canada. The system had to be portable so that the pumping system

could be moved to different levels as the decline developed. Varying heads and flows create the need for flexibility. The maximum conditions were the basis of the pump selection and incorporated 100% back-up.

It is critical that the entire system be reliable. An important feature of the design was the use of dirty-water pumps that can handle up to 10% solids by weight. This eliminates the need for underground clarifiers, allowing the solids to be pumped to the surface for additional processing or disposal.

In June 2004, the project resurfaced with updated head and flow requirements. A new proposal was submitted incorporating Metso Slurry Pumps. One key element in the choice of equipment for this project was the lack of clean water for packing glands or seals. System requirements were as follows:

- Flow Rate - 1200 GPM - 272 m³/h
- Total Dynamic Head - 744 Ft. - 227 m.
- Specific Gravity Slurry - 1.05 Very fine particles

Metso Minerals (Sweden) AB, Norrängsgatan 2, 733 38 Sala, Sweden.
Phone +46 224 570 00. www.metso.com. minerals.info@metso.com

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With the help of PumpDim™ selection program, the system was analyzed and two stage pumping was determined to be the best solution to this application. Metso Orion Series HM150 D pumps with centrifugal seals were selected for the first stage and high pressure Metso Orion HM150 D pumps with Metso BF Slurry Mechanical Seal were chosen for the second stage. Standard high chrome casings with high strength casing bolts were required on the second stage to satisfy the pressure requirements. This design requires no seal water which was a key selling point for the customer.

The system design included:

- Four pumps mounted on a common skid for easy movement
- Cross piping to consolidate space which is at a premium underground
- 200 HP - 150 kW motors mounted on straddle mount overhead motor bases
- Guards equipped with hinge mounted front covers for easy belt access
- A 1600 cubic foot - 45 cubic meter skid mounted sump with an agitator, access ladder, suction and overflow connections.

The preliminary design developed by ANM / Miller Engineering, prior to being a Metso Pump Distributor, used pumps from another manufacturer that required a complete seal water system. Many times the success or failure of a pumping system depends on the reliability of the seal water system. Too often the seal water becomes neglected or the integrity of the system is compromised. The Metso Pumps eliminated this potential problem.

Purchase order for the project was received in August and the first of two pumping skid units was delivered in late September 2004.

To learn more about ANM go to their Web site at: www.anm-equipment.com

To learn more about Metso Slurry Pumps, go to: www.metsominerals.com/pumps



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