Pumpaction

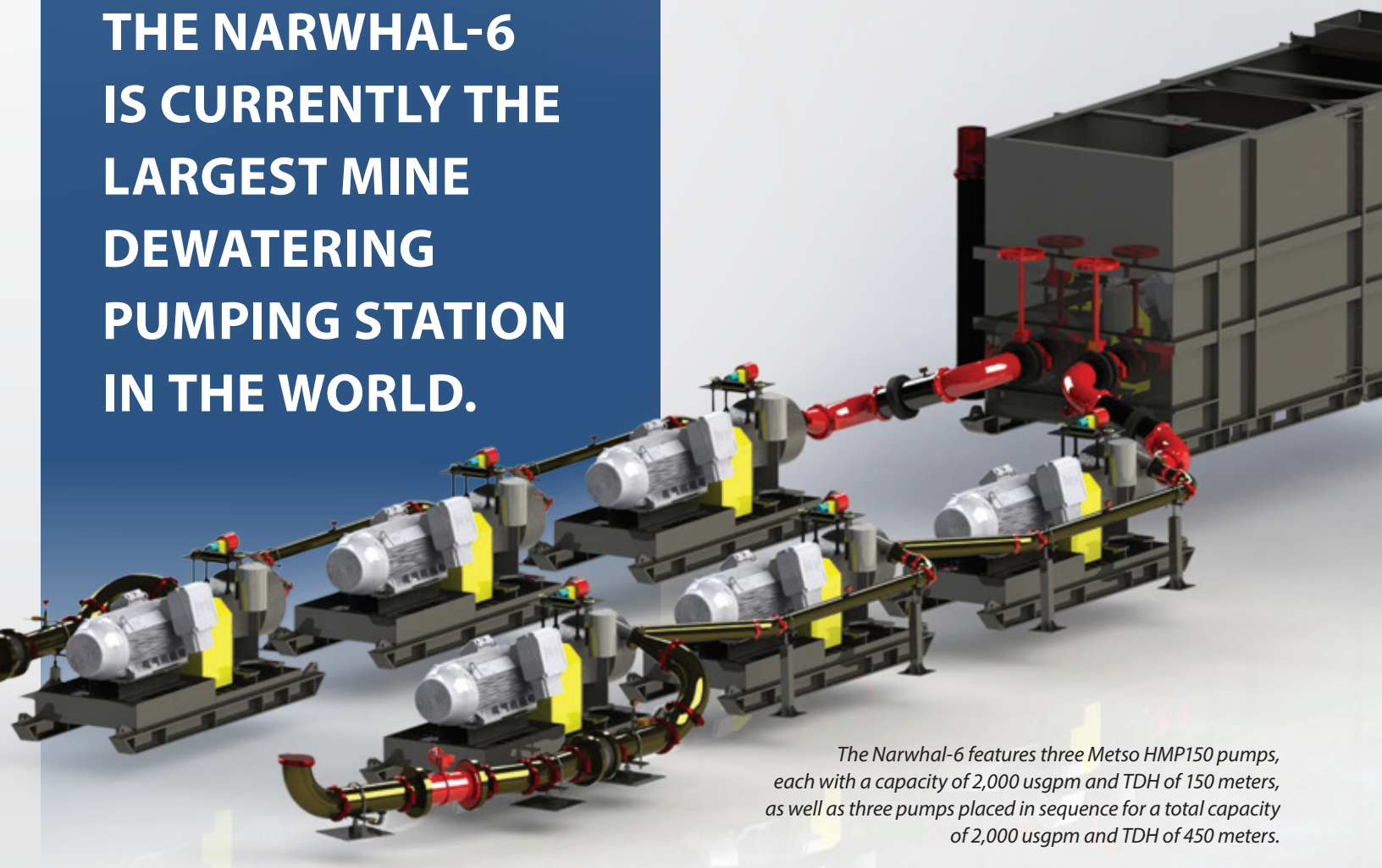
CASE STUDY

A MATTER OF INNOVATION

The Éléonore project is a significant component of Goldcorp's development pipeline, and a key part of Pumpaction's next generation of growth projects.

Goldcorp's development plan detailed accessing what is called the Roberto deposit at the mining site through two shafts. In December 2012, the production shaft sinking began. Underground exploration drilling from the recently completed Gaumond exploration shaft will be gaining speed in 2013, thus requiring further definition drilling of the deep portion of the Roberto deposit in order to proceed. The exploration ramp excavation continues to move forward and, currently, four diamond drills are conducting definition drilling from strategic working platforms in the ramp.

THE NARWHAL-6 IS CURRENTLY THE LARGEST MINE DEWATERING PUMPING STATION IN THE WORLD.



The Narwhal-6 features three Metso HMP150 pumps, each with a capacity of 2,000 usgpm and TDH of 150 meters, as well as three pumps placed in sequence for a total capacity of 2,000 usgpm and TDH of 450 meters.

Deep problems

Goldcorp's massive Éléonore gold mining project involved deep underground exploration drilling work. As a result, vast quantities of underground water (± 2,400 usgpm or, according to geological studies, about 8 times the amount found in an average mine in Quebec) needed to be pumped out of the shaft.

In this particular case, the total dynamic head (TDH) was quite significant – 450 meters, when the average height is usually around 100 meters per lift. Also, the water turned out to be densely filled with solids (about 10 percent), which precluded the company from using a conventional clear water pump.

Finally, there were some logistical problems as well, since the underground pumping station had to be built and set up in a remote location.

The scope of the project, combined with the unique environmental and operational challenges the company faced, called for a solution that was different from the more traditional alternatives available on the market. Goldcorp thus called upon Pumpaction's expertise to determine how they could help them overcome these specific and rather unique challenges.

Teaming for success

For Pumpaction's engineers, it soon became clear that an efficient solution would only be possible through innovation. "Our goal in designing a brand new product was not only to meet all the technological and environmental challenges as described by the company, but also to develop a system that would allow for significant savings in terms of operational costs throughout the entire lifespan of the project, said Dominic Balthazar Mining Sales Manager at Pumpaction. For our team, it is of utmost importance to design solutions that encompass every operational aspect of a given project."

The Narwhal-6 pumping station: A game changer

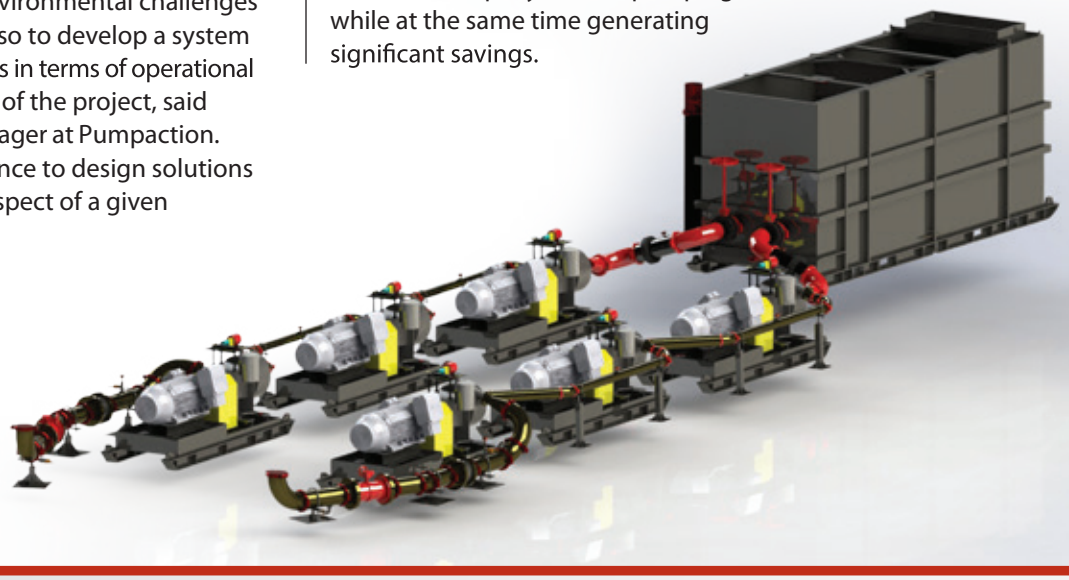
After careful analysis, Pumpaction determined that it needed to design and build a heavy duty, high-pressure pumping system that could pump vast amounts of solids-loaded water out of the shaft. Furthermore, the equipment had to be both modular and easy to install. In other words, the company had to come up with a solution adapted to meet the specific needs of the client – an approach which is at the very core of Pumpaction's mission.

This led to the creation of a system known as the Narwhal-6 pumping station, which features three Metso HMP150 pumps, each with a capacity of 2,000 usgpm and TDH of 150 meters, as well as three pumps placed in sequence for a total capacity of 2,000 usgpm and TDH of 450 meters.

This system includes six 500 HP electric motors. The pumps and motors are directly connected and installed with a variable frequency drive, so as to allow for the modulation of the station's outflow from 1,500 usgpm to 2,000 usgpm.

As shown on the illustration, the Narwhal-6 consists in two parallel pumping systems, each with its own discharge line (12'' in diameter, 2,000 usgpm per line). If required, the pumping capacity can reach 4,000 usgpm (3,000 HP). This innovative semi-portable modular system also features a 45 m^3 tank used to feed water into the pumps.

The Narwhal-6 used at Goldcorp's Roberto deposit is currently the largest mine dewatering pumping station in the world. This never-before-seen pumping system managed to solve the company's water-pumping issues, while at the same time generating significant savings.



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