



**SIEMAG
TECBERG**

TECHNICAL INFORMATION

P.E.S.* IN MINE COOLING SYSTEMS

(*PRESSURE EXCHANGE SYSTEM)

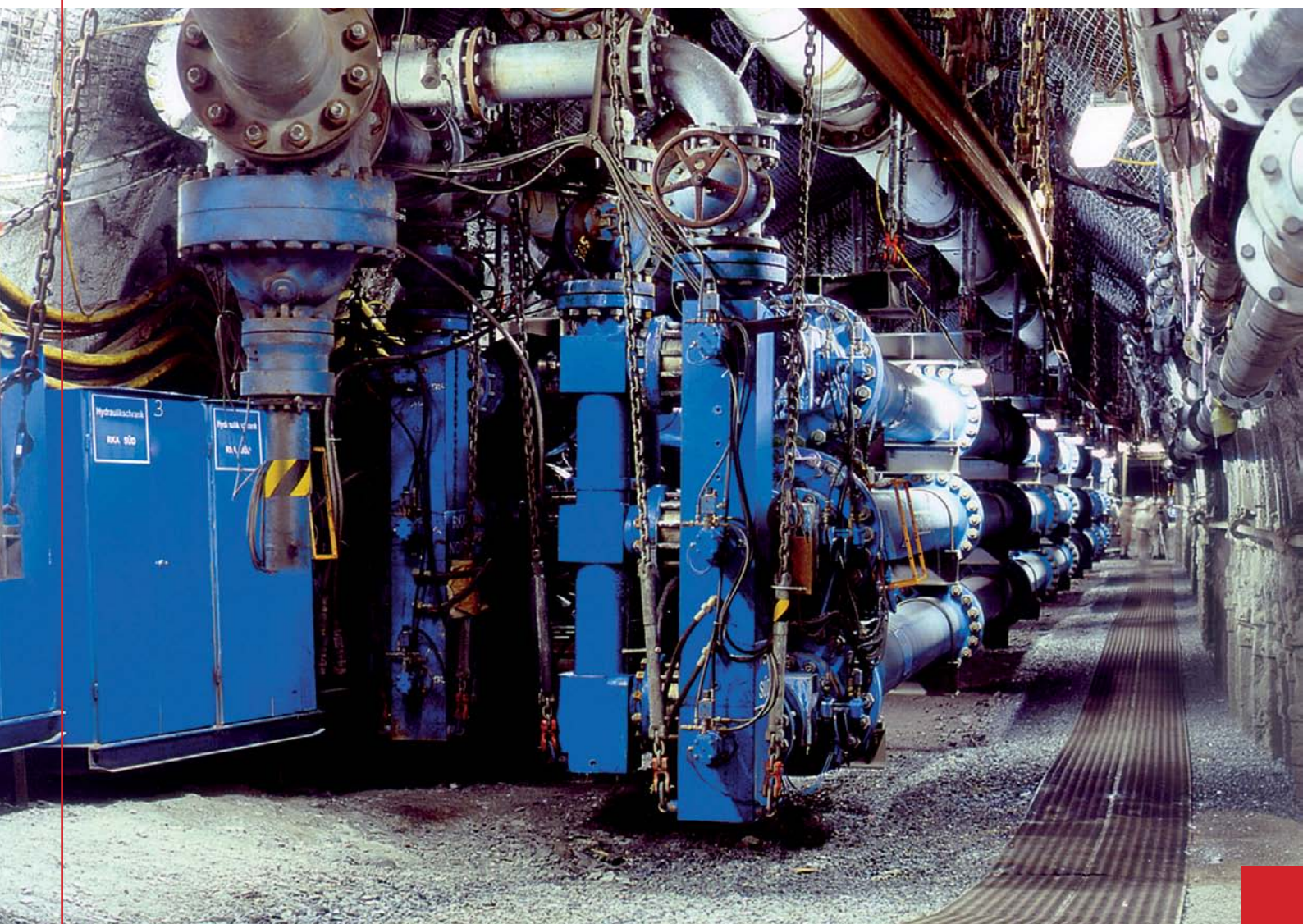
TECHNICAL INFORMATION

P.E.S. IN MINE COOLING SYSTEMS

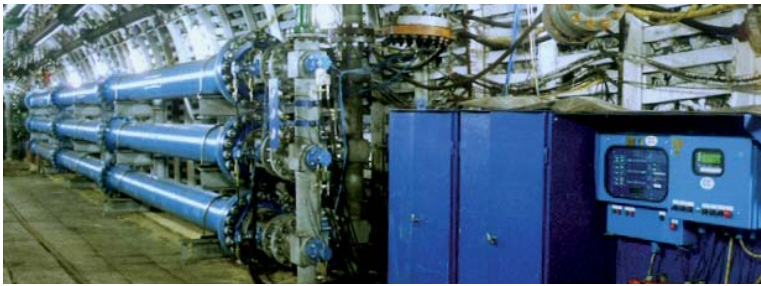
Compared to other methods, the Pressure Exchange System (P.E.S.) as a part of mine cooling systems offers considerable advantages for the cold water transport. The P.E.S. works on the U-pipe principal, which saves costs for the transport of warm water to the surface.

The P.E.S. operates with three chambers, which are charged alternately with cold water and warm water and it guarantees a continuous flow rate in all piping. The chambers are isolated on the inside, thus ensuring that the cold water will be transmitted via the P.E.S. nearly 1:1. The low temperature increase of $<0.5\text{ }^{\circ}\text{C}$ on an average will result in a lower cold water temperature in the underground.

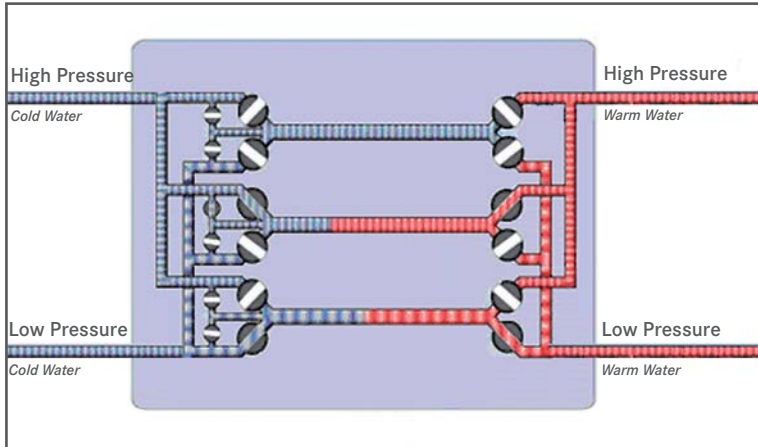
The application can serve different purposes: Transport of a higher cooling capacity with the same installation of piping, valves, pumps, and instruments or decreasing the quantity of cold water, which saves investment costs for pipes, valves, pumps, and instruments and operation costs for pump energy as well. But very often the low temperature is the key to comply with the workplace regulations at face at justifiable expenses.



MOAB KHOTSONG MINE, a large cooling system with pressure exchange systems (P.E.S.)

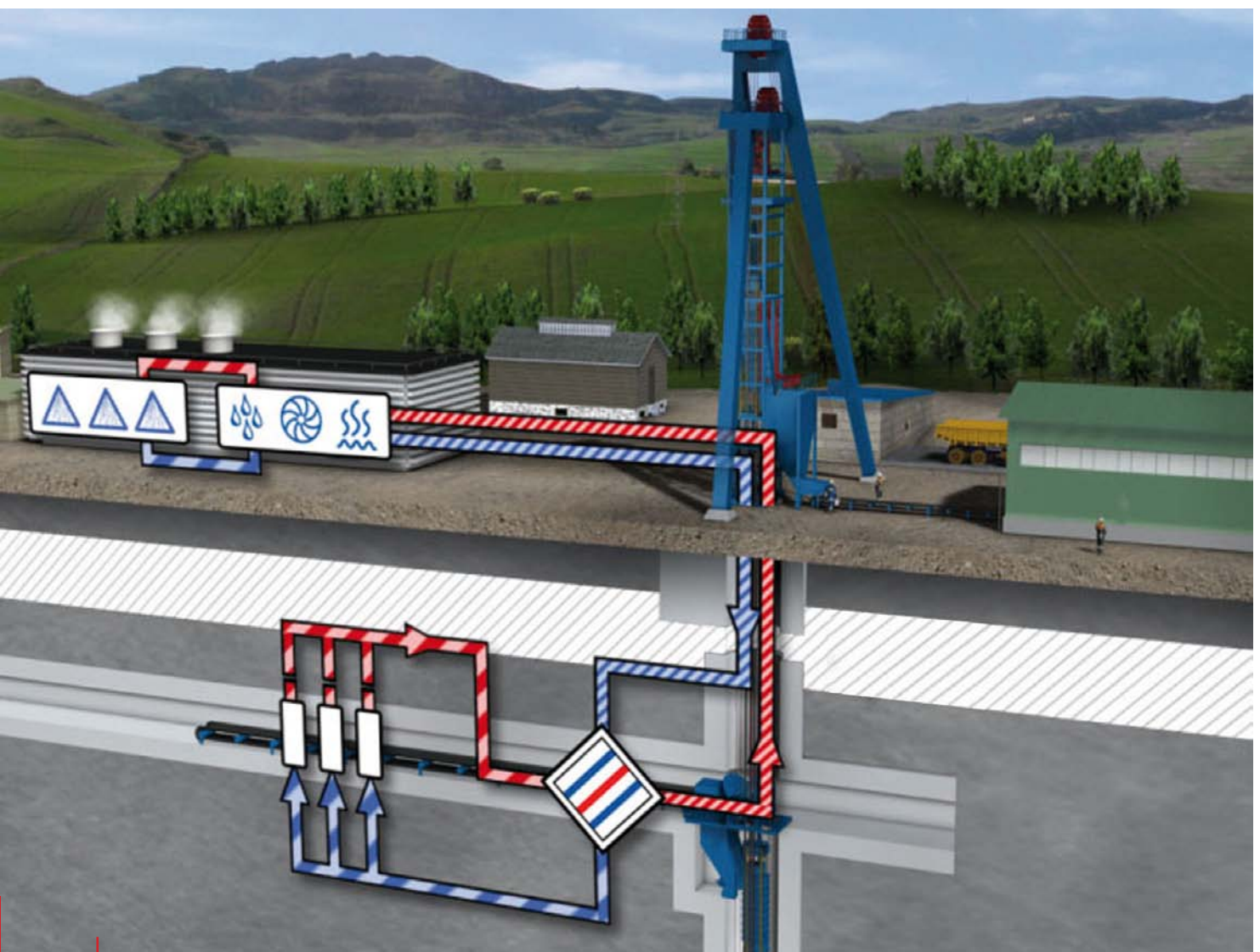


For more than 20 years now, the P.E.S. has been in use worldwide; based on the well engineered and mature technology, the system demonstrates a high availability and an unchanged lifelong efficiency.



THE MAIN FEATURES ARE:

- Temperature increase <math><0.5\text{ }^{\circ}\text{C}</math> on an average
- Higher cooling capacity transport (>25 %)
- Lower quantity of cold water (<30 %)
- Constant lifelong efficiency
- Cooling capacity up to 20 MW with one P.E.S.
- System pressure up to 150 bar with one P.E.S.
- Stepwise expandable
- Low maintenance downtime
- Low space demand
- Electrical consumption <math><2.5\text{ kW/h}</math>



Principle of Mine Cooling System



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