

Making ventilation work for you

J Fernandez

Managing Director, Zitron Australia Pty Ltd, Henderson WA 6166

Email: jfernandez@zitron.com.au

Ventilation is an essential component of any underground mine, playing a vital role in ensuring the health and safety of workers, and a mine's continuous operation.

At a time when mining companies are increasingly having to turn to deeper underground operations in the search for high-grade ore-bodies, the search is on for more efficient ventilation systems that will allow mining to be carried on at ever deeper levels, ensuring the protection of workers, the maximisation of productivity and the lowering of energy costs.

Mining companies are today looking to innovation to deliver new technologies and procedures that will enhance the profitability of their mines. With the energy costs associated with operating ventilation systems being a mine's second-highest cost of production after labour - between 25% and 50% of the total energy requirements of an underground mine - finding the right ventilation solution can be critical to a mine's performance.

The continued use of diesel-powered machinery in ever deeper underground operations is resulting in the need to deliver fresh air over longer distances, generating additional friction, which in turn generates heat and increases the operating pressures of the ventilation fans (resistance), resulting in more powerful ventilations systems being required.

The challenge is therefore to design and install more sophisticated and reliable ventilation systems that reduce air volumes and natural gas levels, and that significantly lower power consumption and thus deliver corresponding reductions in GHG levels.

Taking the time and making the investment to ensure proper planning and design of the ventilation system will ensure that it performs at maximum efficiency, ensuring that the primary fans are able to operate within an optimum range that delivers the required airflow.

Continuous air quality and temperature monitoring are essential to provide miners with a safe and healthy workplace. Ventilation on Demand Systems may save a significant amount of energy in a mine's operation, but in most cases, significant energy savings can also be obtained by analysing and improving the current system on site.

Some large mining companies are reducing the size and capability of their ventilation engineering department and increasing their dependency on the fan manufactures. The experience of the fan manufacturer will benefit the project; however, Ventilation on Demand Systems will need to be fine-tuned and re-adjusted as the mine grows, and we should all make sure the mine ventilation practitioners are adequately trained to analyse the changing mine conditions and to successfully implement the required ventilation solutions.

Consideration must be given to the requirement for full testing at factory. "Fan suppliers should be able to test their fans at factory (prior to being despatched to site) at full power and simulating the mine future requirements".