

New technology could save the mining industry millions

The mining industry currently is overburdened with almost 60 per cent of its energy costs being associated with ventilation. Typically, underground mines are ventilated continuously, based on peak demand and requirements. This can result in a considerable amount of air being needlessly cooled, heated and pushed around by fans. "With the right ventilation controls, a hard rock mine's annual power requirements and costs could be reduced by 30 to 40 per cent compared to a constant air delivery system," says Stephen Hardcastle, a senior research scientist with the CANMET-MMSL, part of Natural Resources Canada, who specializes in ventilation research.

Changing the way metal mines are ventilated could dramatically increase energy efficiency and spell big financial savings for mining companies world-wide. Deeper mines, higher energy costs, increased mobility and large diesel-powered vehicles are all pointing to the need for more energy-efficient ventilation systems.

Few areas in a mine need to be constantly ventilated as each employs a discontinuous process. Ventilation-On-Demand is an effective method to reduce the redundant use of air flow operating at peak capacity. Ventilation-On-Demand is a departure from traditional ventilation thinking; it operates on the variability associated with production requirements in the mine. Until now, there has not been one complete system that could intuitively interact with the mine design, control, ventilation maintenance, energy management, air quality and ventilation modelling in one streamlined operation.

BESTECH, one of Canada's leading software development and engineering firms, is completing an advanced control suite that will revolutionize and optimize underground mining ventilation. "Our team is testing technology that no other competitor has in place," says Marc Boudreau, CEO of BESTECH.

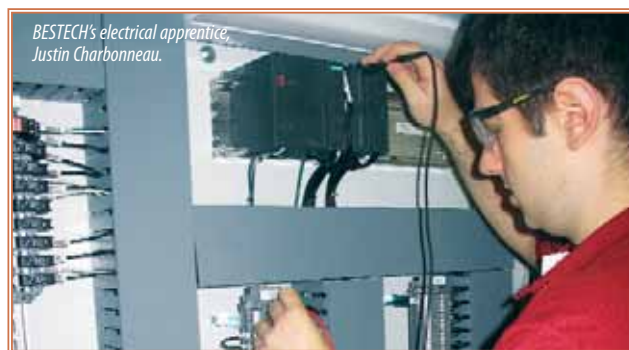
"The solution we are demonstrating, NRG1-ECO (Energy Consumption Optimization), is highly-advanced, completely unique to the mining industry, and is built upon the success of our initial NRG-1 software," explains Boudreau. Accordingly, the new system's processes will dramatically reduce a mine's energy consumption and greenhouse gas emissions while increasing its productivity, profitability and air quality.

To ensure that BESTECH's new system meets the needs of various industries world-wide, Boudreau has formed a consortium of industry experts and organizations that will support BESTECH in establishing the industry best practices and standards of excellence for NRG1-ECO. Consortium members include organizations such as the Centre for Mining Excellence (CEMI) and international mine site technology providers. Mining giants Vale Inco and Xstrata Nickel are also consortium members, and will have the NRG1-ECO technology installed within their mines by March 2010.

NRG1-ECO's human interface is a user-friendly web-based solution that will offer manual control, time-of-day scheduling, event-



BESTECH's CEO Marc Boudreau.



BESTECH's electrical apprentice, Justin Charbonneau.



BESTECH's EIT Marc Peters.

based control, asset monitoring and control as well as environmental monitoring and control. It uses sensors to monitor the location of miners, equipment and air quality, and adjusts the ventilation accordingly. Vehicles can be tagged and tracked in the mine, engine performance can be logged and payload information can be gathered. Ventilation can be controlled in a fail-safe manner according to the simultaneous processing of incoming data, including the vehicle type and location, the location of the miners and the mining activity.

NRG1-ECO will evaluate and react when the mine's ventilation system is required to work at peak capacity, and when there is no activity,

to work at reduced ventilation levels to increase efficiency. NRG1-ECO is configurable to each mine's unique requirements, and offers an open Industrial-Plug-and-Play interface to allow system integration with other existing or new processes. The system offers the option of built-in communication redundancy, ensuring operational robustness and complete reliability in case of an interruption in communication.

Intelligent Zone Controllers are a key component to the field-installed NRG1-ECO equipment. It integrates key control parameters such as user-configurable schedules, real-time environmental data and current activity-based control information. The Intelligent Zone Controller (IZC) is designed to be located close to the devices it controls to improve the operation of the entire system. Communication failures do not compromise the system's performance. It is designed to reliably handle environmental extremes in temperature, dust, moisture, and vibration present in the mining environment. Many types of environmental monitoring sensors can be integrated into the system to monitor temperature, humidity, Carbon Monoxide (CO), Carbon dioxide (CO₂), Nitrogen Monoxide (NO) or Nitrogen Dioxide (NO₂), and react to ventilation requirements immediately.

BESTECH's main objective is to continue to install NRG1-ECO in operating mines by addressing each mine's individual challenges and creating solutions that are applicable to the mining industry on a global scale. The BESTECH team will benchmark each installation to gain a better understanding of the significant impact NRG1-ECO's control strategies can have on conserving energy use in the mining industry.

The expected benefits of NRG1-ECO to a mining company are a 20 to 30 per cent reduction in yearly energy costs and a significant 5,000 tonne reduction of CO₂ per year per mine site. The Kidd Creek Mine, located near Timmins, Ontario, installed NRG-1 in 2000. As a result of employing NRG-1, the mine realized a substantial 23 per cent decrease in energy consumption, and decreased the incidence of air quality complaints. Kidd Creek now saves an estimated \$1 million dollars per year in energy costs.

Barrick Gold's Goldstrike Mine, located in northeast Nevada, realized the benefits of the software suite immediately, reducing tedious operator tasks and benefiting from improved ventilation control and energy savings that amounted to more than \$5,000 per day or 1.825 million dollars per year. In addition, a five to 10 per cent increase in productivity is anticipated with the implementation of PORTAULS®, a process analysis software that presents key performance indicators, production reports and play back utilities in a graphical format in order to troubleshoot information that is difficult to visualize. K2 Blackpearl is an effective business process management system that completes NRG1-ECO.

BESTECH is a division of the Boudreau-Espley-Pitre Corporation. BESTECH was created to address the need for a group dedicated to system integration and industrial automation. The company has established a solid reputation in the world of engineering, software development and environmental monitoring. Its philosophy revolves around delivering quality services and innovative products – on-time, on-budget and on-spec.

The image is a logo collage for BESTECH. At the top is the BESTECH logo, featuring a stylized orange and yellow 'B' icon above the word 'BESTECH' in blue. Below this is a horizontal line with the text 'NRG1-ECO Consortium Members'. Underneath are the logos for CEMI (Centre for Excellence in Mining Innovation), VALE INCO, and xstrata nickel. Another horizontal line follows, with the text 'Funding Partners'. Below this is the logo for Sustainable Development Technology Canada. A final horizontal line is labeled 'Key Participants'. Underneath are the logos for Allen-Bradley, Canada (Natural Resources Canada), Mirarco Mining Innovation, Mine Site Technologies, Mine Ventilation Services (MVS), and Schneider Electric.

BESTECH's dynamic team of professionals works to surpass the traditional and commonplace. Our strategy is to provide innovative and cost-effective solutions to meet our clients' needs. Our commitment to excellence is manifested in the successful development and implementation of an integrated project management approach, automated engineering design standards, and our everyday communication with new and existing clients.

For more information on Ventilation-On-Demand and NRG1-ECO, please visit www.bestech.com. ☒