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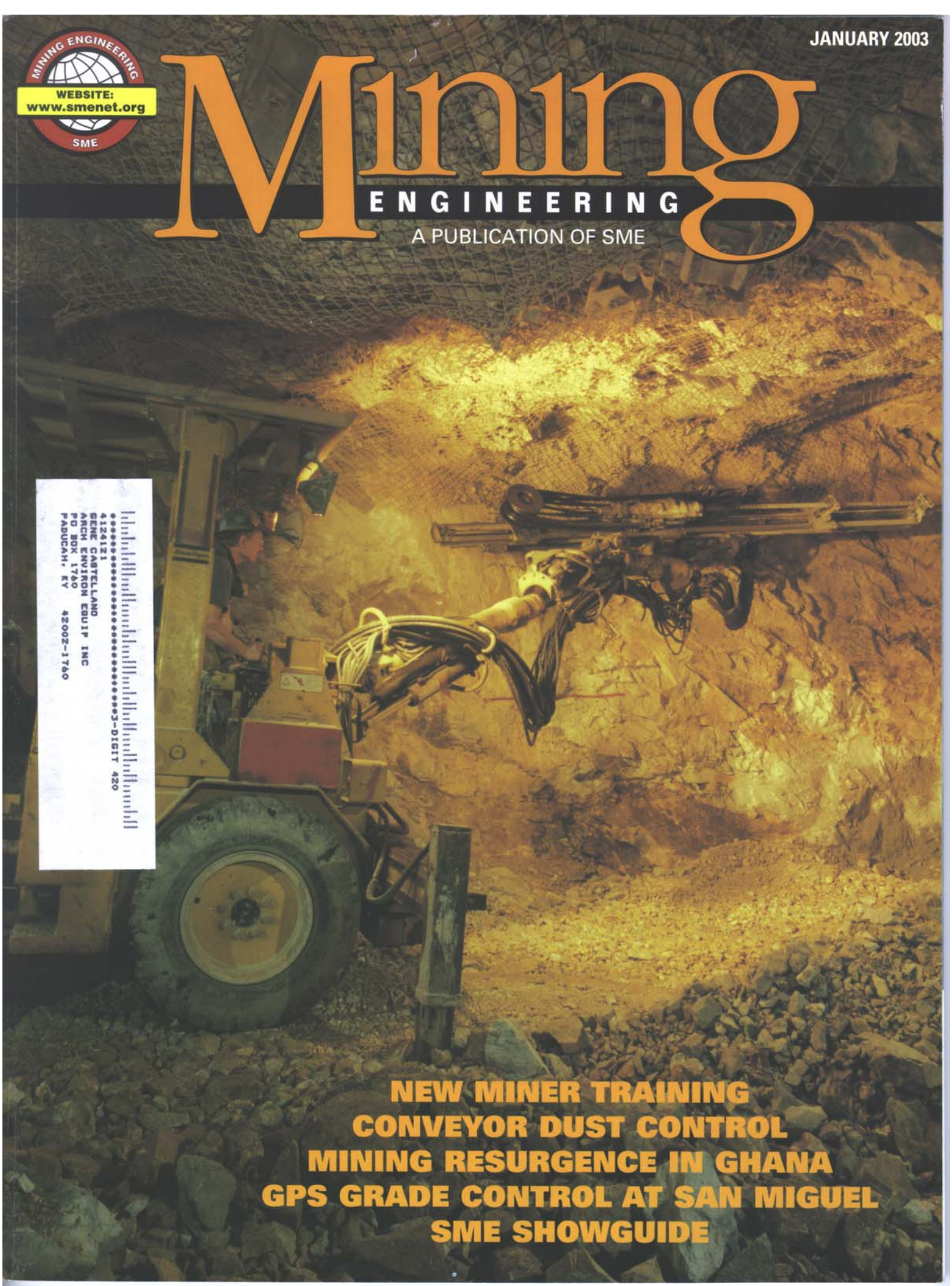

NEW MINER TRAINING
CONVEYOR DUST CONTROL
MINING RESURGENCE IN GHANA
GPS GRADE CONTROL AT SAN MIGUEL
SME SHOWGUIDE

Controlling conveyor dust before it becomes a problem

Due to the increased chance of violations and shutdowns by the U.S Occupational Safety and Health Administration (OSHA) and the U.S. Environmental Protection Agency (EPA), a company can save itself problems by taking control of the dust caused by conveying material. A complete dust-control policy can keep these emissions confined, sealed and suppressed, protecting the environment from fugitive, airborne dust.

Material handling and processing, storage and traffic are the major dust producing sources. All industries that convey dry, light material need a dust control system.

An Arch simplicity impact system and at-last-a-sealing system installed at a conveyor transfer point.

Understanding air quality standards

First, the facility must be evaluated to make sure it is in compliance with the EPA Title V program of air quality standards and requirements. Under this program, companies must certify annually their compliance with federal air-quality standards. To ensure compliance, a company must identify the standards for meeting air quality regulations and assess what needs to be done to achieve compliance. If a company fails to assess and correct air quality control, it could be cited for violation. By correcting the problem in its early stages, a company will benefit economically. And it will protect its employees and the environment.

Once the problems are identified, preventive and corrective measures must be assessed to break the problematic dust down in three phases: confine, seal and suppress. Only with the combination of all three will maximum dust control be attained.

Confine

To properly confine dust, enclosures must be created using doghouses, buildings, windscreens and chute baffles. For maximum efficiency of agglomerate dust control, the dust source should be enclosed to provide protection from ambient conditions, especially wind.

Transfer points. At transfer points, enclosures should include a head box with inlet strip curtain, a seal on the underside of the feeder belt, a tight chute with a rock box, a cover over the receiving belt and a cover extending back on the receiving belt.

The receiving belt cover should extend at least three belt widths downstream from the chute discharge. The height of this cover should be at least equal to the belt width. And the rear cover should extend behind the chute discharge about one belt width or more. In addition, tight skirt boards are necessary for the length of the belt cover. Strip curtains should be fitted at the front and back of the chute. Intermediate strip curtains may be required to form agglomerating chambers along the skirt length.

An Arch fogger system suppressing dust over an open discharge chute of a conveyor.

Screens. A screen can be enclosed or open above

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the deck. If the screen is open, the feeder belt should be enclosed with a head box that extends over the deck and distribution plate to provide a protected area for agglomeration. The area between the deck and the hopper should be sealed with a flexible material to prevent dust emissions at this point. It is preferred that all screen discharge chutes be enclosed and the receiving belts be treated as a transfer point.

Crushers. The enclosure size will vary depending on the type of crusher and the material being crushed. A rock box under the crusher with substantial empty volume is the most desirable system. Also, the receiving belt must be tightly sealed with an impact system installed to prevent belt sag. The mouth of a crusher should be protected from wind so the belt, chute or feeder is "enclosed" with the crusher.

Seal

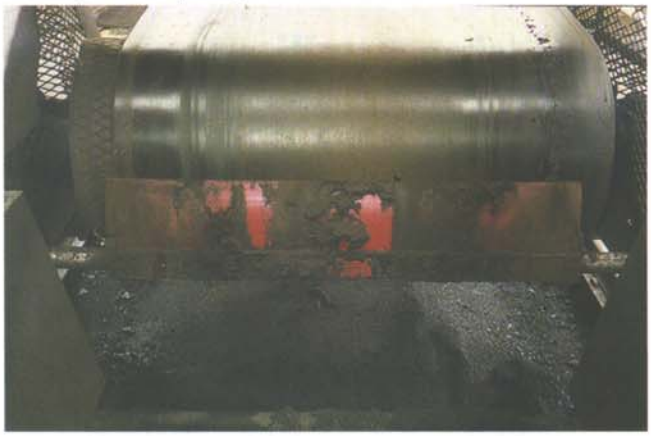
To maximize dust control, the use of impact or slider beds, along with skirting, is necessary. Without the use of the impact or slider beds, the belt may sag between idlers, allowing material and dust to easily escape.

Skirt seals. These are designed to take the conveyor dynamics into account. And they prevent material from escaping through the gaps caused by belt sag. The most effective skirt seals have flexibility. This allows the seal to conform to the ever-changing belt surface. These seals will provide optimal seal with low maintenance and little belt wear. Used in conjunction with an existing skirt seal, the dust seal forms a secondary sealing area. Easily installed, a dust seal can be tied into the system to seal and prevent dust from migrating into the open air.

Suppress

The moisture content of the material processed can have an effect on emissions. However, as crushing creates new fine particles, the moisture content is reduced by evaporation. This, in turn, diminishes the suppressive effect, requiring a mechanical need for moisture enhancement. This is where a dust control system is necessary. Most facilities that use wet suppression systems control dust emissions and maintain a relatively high material-moisture content.

A Gordon Saber primary belt cleaner installed on a conveyor head pulley.



Fogger systems. These systems can agglomerate the dust particles. This increases the density and forces the particles to settle at a faster rate. When water droplets produced from fogger systems and dust particles collide, they agglomerate. This action is achieved by atomizing (or fogging) the water, thus forming a droplet size that is close to the size of a dust particle. This will, in turn, reduce opacity readings. Another benefit of a fogger system is the low volume of water required to achieve effective dust control.

The most effective and maintenance-free fogger systems use water only, with no air or chemical injectors required. When water droplets and dust particles collide, the electrostatic forces allow particles of dust to settle through atomized suppression.

A Flexiskirt sealing system and a Simplicity slider bed installed at a conveyor load area.

Belt cleaners. These additional controls reduce carryback that produces piles under the conveyor belt and fugitive dust created by the return rolls "beating" the dust and dirt from the belt cover. This eliminates dangerous cleanup around conveyors. And it reduces downtime due to the cleaning. An efficient belt cleaner also prevents unnecessary wear on the conveyor belt and conveyor components. Most importantly, this will also reduce dust emissions produced from weathered piles escaping into the air.

Conclusion

There is no one way to prevent dust emissions. It requires a total concept approach. The confine-seal-suppress method of dust control has provided excellent results in numerous applications. Only with the combination of all three will maximum dust control be attained. ■