



Bulk Bag Unloader Eliminates Cyanide Danger at Gold Mine

Customer

Morrison-Knudsen, Denver, Colorado for Compania Minera Sipan S A., Lima, Peru.

Problem

Compania Minera Sipan mines and refines gold in the Sipan region of Peru. Although legend has miners finding pure nuggets of the valuable mineral, most gold is found as fine grains dispersed through solid rock. To release this gold the ore must be finely ground and the gold dissolved out with reagents.

Gold is the most stable element known and will react to few chemicals. One of the most effective is cyanide, and the form employed by most gold mines is potassium cyanide (KCN). Minera Sipan uses the powdered form, which readily dissolves in water, yet can produce dust, harmful to process workers and to the environment.

Minera Sipan mixes a slurry of ground ore and water with the finely powdered potassium cyanide. The company receives its potassium cyanide in bulk bags and discharges the material into an agitated mix tank. Here the solids remain in suspension during dissolution, and oxygen is introduced to aid in the dissolving process. Activated carbon adsorbs the dissolved gold.

Cyanide transportation and use is regulated by "dangerous goods, hazardous chemicals and mining" legislation, which is strictly enforced. Mines also undergo regular inspections by the Department of Mineral Resources and the Environmental Protection Authority to ensure compliance with regulations.

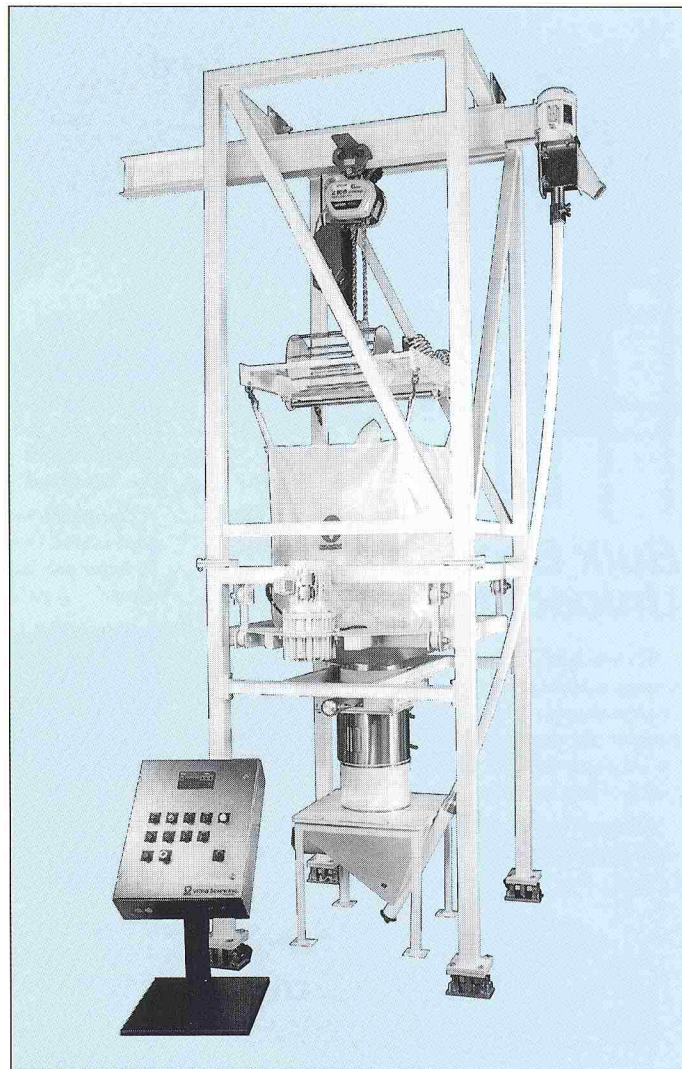
Additionally, cyanide is a high cost material and one of the largest expenses in the gold dissolving and extraction process.

Minera Sipan employs stringent handling procedures and a system of containment bunds, residue disposal dams and water recycling systems, yet it had to assure a safe, dust-free method of discharging approximately one bulk bag of material every four hours.

Solution

Vibra Screw supplied the answer by creating a fully-enclosed dust-free bulk bag unloading system with bag hoist, dust pickup, dust collector fan and an on-board rotary feeder.

The design protects operators from exposure to the bags' contents by firmly seating bags on the upper hopper before opening. Other bag discharge systems require the operator to open the bag before lowering



Vibra Screw fully enclosed its Bulk Bag Unloader and its built-in dust collection system (Open Version Shown) to eliminate any exposure to toxic potassium cyanide by gold refining personnel.

into position. Vibra Screw was asked to deliver the system in an extremely short lead time due to need and shipping limitations. The system was designed, fabricated and shipped in four weeks so it could be transported by truck to the port of Los Angeles to meet the ship's sailing schedule.

Result

With the system's hoist and bag support, the Minera Sipan operators have minimum contact with the cyanide-filled bag. Minera Sipan is able to extract gold with an anticipated output of 100,000 ounces per year.