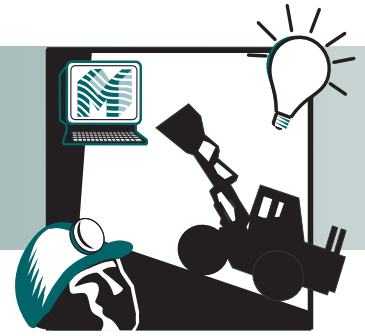


MINING

Project Fact Sheet



SMART SCREENING SYSTEMS FOR MINING

BENEFITS

- Reduces energy requirements for screening by 75%.
- Reduces maintenance costs in screening operations.
- Improves process throughput.
- Reduces noise and vibration levels increasing worker safety and health.

APPLICATION

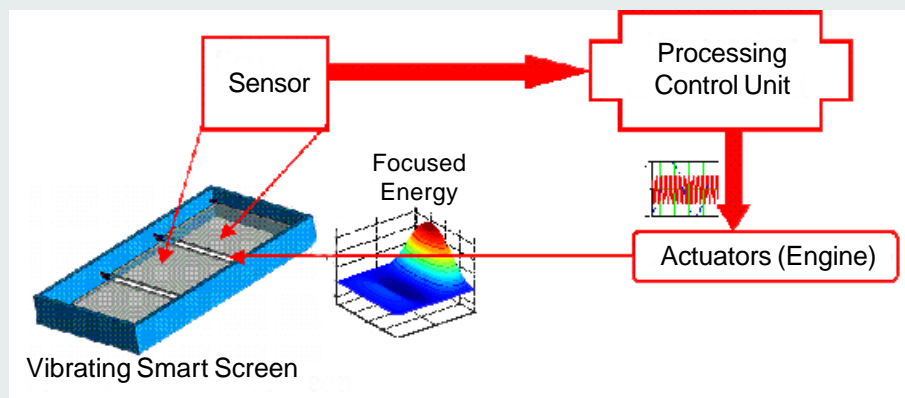
Smart screening systems can be applied to all mined materials that must pass through the physical separation process of vibrating screens.

SMART SCREENING SYSTEMS WILL INCREASE ENERGY EFFICIENCY AND THROUGHPUT

Current screening machines all work using an electrical motor with a rotating eccentric weight that generates the shaking motion. These unbalanced electrical motors are bulky and require high maintenance. They waste much of their energy through useless elastic deformation of the heavy supporting structure, generation of audible and very loud noises, and excess heat. Excess heat and mechanical vibration causes many of the moving components, such as bearings, to have a very short life, creating excess maintenance costs.

Smart Screening is based on controlling the flow of energy and confining the energy to the screen rather than shaking the entire support structure. The Smart Screening System will save energy by replacing the massive electrical motor with miniaturized, smart ceramic-based motors in combination with multi-staged resonators. Also, ceramic fibers will be incorporated in sieves so the shaking takes place at the mesh level, improving the effectiveness and efficiency of the system. The benefits of a Smart Screening System will be reduced energy requirements, reduced maintenance costs in screening operations, improved throughput, and reduced noise and vibration levels in screening operations.

SMART SCREEN SYSTEM



Conceptual design of a closed loop control system for a Smart Screen System.



Project Description

Objective: To develop a Smart Screening System that reduces energy us in screening processes by 75%. In addition, Smart Screening Systems will reduce maintenance requirements, improve throughput, and increase work safety and health.

The project will analyze a series of Smart Screening Systems over a period of one year. In the second year, one fully functional unit will be installed in each of the mining company partners (MINNTAC and Inland). In the third year, one whole section will be upgraded and evaluated at MINNTAC. During the same period, a smaller number of systems will be installed and evaluated at Inland Mining. Full deployment is planned in the fourth year.

Progress and Milestones

Activities to be completed in this project include:

- Develop prototype for fabrication and evaluation in the lab.
- Install prototypes at mining companies for evaluation.
- Expand and install full system prototype at mining site for evaluation.
- Full deployment of the Smart Screening System

Commercialization Plan

Two mining companies, U.S. Steel (MINNTAC) and ISPAT Inland Mining, are partnering on this project. They have expressed their commitment to implement the technology once proven in the field. Other applications of the Smart Screen Systems are in the areas of pharmaceutical, food processing, oil/gas, coal processing, and recycling industry.



PROJECT PARTNERS

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