



PROJECT PROFILE

PCS-BORING MACHINE

CLIENT CHALLENGE

One of the world's largest potash producers was experiencing difficulties with a particular type of underground continuous boring machine (locomotive in size). The operational time between service shut downs for repairs and maintenance was diminishing to the point of questionable profitability on the operation and machine. Prior to joining Palladium Product Development and Design several current Palladium personnel were retained to investigate the situation and report to the company on possible remediation strategies.

SOLUTION

Services included engineering examination of the existing machine design and operation based on analyses of mechanism kinematics and kinetic energy, rock cutting torque, and inertia in the power train components with subsequent suggestion of options for improvement.

PROJECT HIGHLIGHTS

- Review of the existing machine design and performance
- Analysis of the load required to cut soft rock
- Analysis of inertial forces in the mechanism, i.e. kinematics and kinetic studies
- Analysis of inertia in a power train system

The investigations resulted in suggestions for alternative design solutions for modifications to the existing machine design, including; changing a cutting arm configuration, alternative geometry of driving components, using rollers instead of sliding bearings, a slower drive motor combined with a lower ratio gear case.

SUSTAINING ENGINEERING

Is provided by Palladium Product Development & Design on an ongoing basis for many products, industries and companies such as the case history described above. Many of the same personnel are still active and providing services to past clients they have served, with continued upgrades and product improvement programs. Design modifications related to mining, conveying and material handling equipment, newly researched systems improvements and implementation of client/user feedback are routinely implemented as a result of these analyses and design services.

