

“Tribology and Mining”

We are always hearing that mining is still “pick and shovel” and using methodologies that are anything from forty to ten years outdated; this is changing.

Health, safety and environmental pressures as well as cost and productivity issues and politics are necessitating change and development in the mining and quarrying arena.

Most existing shallow depth ore bodies are already exploited, so more and more deep and ultra deep ore bodies will have to be mined safely and efficiently.

Futuristic and high technology machinery and methodologies will have to be developed and implemented, going through a transition phase.

Tribology regimes exist all over the range of mining and extractive activities

So where does tribology fit in? Many mining people (yes, even engineers) think of tribology (if they have heard of it) only in terms of ‘lubrication of moving parts’ in mining machinery: far from it.

Tribology regimes exist all over the range of mining

and extractive activities; from exploration, defining, mining/digging (actual removal of waste or overburden as well as the desired ore), processing, etc, right through to delivery of the final product.

For example, think of rock drills, diamond tipped saws, rock cutters (continuous miners) and the bucket edges of shovels, loaders back-actors and draglines: all have ground engaging tools that interact with the earth, rock or ore, thus there are surfaces moving relative to each other, therefore friction and wear and developing inefficiencies – tribology!

Likewise conveyance of waste, slurries and ore through extraction and processing, via haul trucks, skips, conveyors, chutes, ore passes, pipelines etc. are tribology regimes.

Services such as air, water, electricity, cooling and hoisting also incorporate tribology regimes.

So, right from Alpha to Omega, there must be an appreciation of tribology in all its forms, and constant research, development and education of those leaders or managers involved, especially the technical and engineering personnel, whether they are mechanical, civil, electrical or mining engineers, metallurgists, or design draughtsmen. The mining, administrative and financial managers also should be made aware of the benefits that improved or best tribological practices can deliver.

There are significant signed-off case studies of tribological-based value delivered through the mining chain, but the key is education and awareness.

All professionals should have exposure to tribology, whether in academic courses for their initial diplomas and degrees, post graduate studies or on-the-job experience - yes even accountants and administrators, who will be needed to fund the education, R&D and implementation of that which will aid improved safety, environment and production, thus aiding the ease and future of the industry in these current tumultuous times.

Despite being often labeled as conservative and resistant to change, mining people want to be at the forefront of future technology, so awareness and education are of paramount importance.

David Gamble

SAIT committee member

For more information contact
Gill Fuller at 011 802-5145 or at
secretary@sait.org.za.

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