



I recently opened two SAIMM events, the 'Optimization of the Mine Value Chain' conference and an 'Underground Load and Haul' school; events targeted at different audiences but dealing with, among other things, a common challenge – that of effective technology transfer in the minerals industry.

Central to this challenge is the understanding and acceptance that our businesses are complex systems and operate as integral, interdependent parts of larger systems. In a simple model that I often use to map and understand system interdependencies and to which I referred last month, activities are considered in terms of people, processes, and technology, operating in a social and business context.

The need to move from one operating state with its people, processes, and technologies, to another state, within an operating context, is driven by pressure. Essentially the discomfort of staying in one operating state has to be greater than that of moving to the next if change is to occur. Sadly, human nature is such that we generally move to a new operating state only because we have to.

The South African coal industry has over the years effectively adopted and improved mechanized mining methods simply to stay in business. Coal is truly a global commodity and as the global seaborne coal trade evolved, the pressure for lower cost production became untenable and the industry adopted and adapted technology and operating practices to remain competitive. Similarly, as iron-ore supply to the steel industry has evolved into a global commodity market, so have the iron-ore producers become global competitors.

Both of these industry commodity segments are characterized by relatively thin margins, the need to move high volumes, and a large and increasing number of global producers. A look at the shape and shifting scale of the coal and iron-ore industry cost curves over time clearly shows there has been no alternative but to adapt.

Conversely, the precious metals segments of gold and PGMs have been characterized by increasing real metal prices over time which have shielded operations, and the industry, from the need to change. Increases in real metal price over the last decade have enabled the perpetuation of less efficient processes and technologies and delayed the need for change, as companies have produced acceptable returns to investors despite declining or static productivity. In these times of scarce capital there is a lack of confidence by shareholders in the ability of mining companies to deliver competitive returns, relative to other industries. The minerals industry is being reshaped, starting with the CEOs - half of the CEOs of the top ten mining companies have moved on in the last twelve months. The South African precious metals sector now reflects the reality of the global economy, with investors demanding that chief executives deliver on and improve returns from existing assets rather than looking for new growth or acquisitions to improve shareholder returns.

In underground mining operations labour input costs in non-mechanized, narrow-reef tabular mining account for around 50 per cent of cash operating costs. Currently, because of the global economic environment, cash operating costs are escalating faster than metal price increases and we therefore have the perfect driver for change in the underground mining precious metals industry. Underground narrow tabular mining must now rapidly evolve to more efficient methods – the time has come to 'adapt or die'. Significant progress has been made in the development of mechanized extra-low profile and ultra-low profile stoping equipment, so to a certain extent we have the technology. We understand the processes associated with the new mine layouts and designs, and are developing the skills of people to implement the technology, but the challenge in effective transfer lies in the operating context.

How do you implement a mining method that will ultimately result in a reduction in employment, for the same levels of output, in an environment where 45 per cent of people who could be working cannot find employment? In an environment where, despite regular above-CPI wage increases for organized labour in mining, the standard of living of the majority of the industry workforce is being eroded by the escalating cost of basic foodstuffs, fuel, and electricity, the structural elements that form a larger part of expenses in the lower income sector, and which are increasing faster than the CPI. All of this in an environment of social and political turmoil fuelled by unrealized expectations of a better life arising from the establishment of a democratic South Africa.

The technology transfer challenge facing the underground narrow tabular mining industry is less about technology and more about people and a social compact to allow transformation of the industry. The questions I keep asking myself are: Do we fully understand the problem, and do we have the right approach and skills to achieve that understanding?

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