

Gold-PM Keynote Address

AN ENGINEERING MODEL FOR INNOVATION IN THE MINING INDUSTRY

By

John O'Callaghan

Newcrest Mining Limited, Australia

Presenter and Corresponding Author

John O'Callaghan

ABSTRACT

There is no doubt that the word and concept of “innovation” is over-used today. Most reported innovation is merely incremental improvement and “business as usual”. While incremental improvement is important, true innovation is transformational or business disruptive and requires a driving force of great need for the innovation to occur (“necessity is the mother of invention”). For the mining industry these driving forces have historically been forced upon us from external factors e.g. government regulation, societal and environmental pressures, low grades or “dirty ore-bodies” etc. While we recognise the need for innovation, we often find it difficult to get traction as an internal motivation is required when often there is no apparent need to do anything ... “right now”.

To help focus on the key parameters of innovation and especially the key requirement of driving force it may help to think about innovation as an analogy to heat and mass transfer e.g. heat transfer = $h \times A \times \Delta T$ (or rate of mass transfer = $k_L \times a \times (c^* - c)$)

That is innovation rate transfer, $r_i = k_i \times A_i \times \Delta S_i$

With:-

r_i : Innovation rate transfer is defined as the speed at which innovation adds value to a business.

ΔS_i : For innovation driving force ΔS_i this could be defined as (“future state position”) – (“current state position”). Like heat and/or mass transfer, innovation cannot occur without a driving force. A key role for management is to define the vision and driving force for innovation and anticipate or drive towards desirable future states.

“ k_i ” : An equivalent of the heat and/or mass transfer co-efficient in “doing innovation”. There must also be sufficient “agitators” or effective agents of change within an organisation to make change happen. A low k_i means slow progress, however often organisations can become too focussed on k_i without clearly defining the ΔS_i and throw “resources at innovation, hoping for the best.

A_i : A_i could be thought of as the extent to which the innovation could be applied across a business.

These factors and the interrelationships between them are explored further especially the key driving force ΔS_i .

Keywords (use Keywords style): innovation, heat transfer analogy