



**The Impact of People 2**  
**19 July 2010**

I introduced the issue of people in my last column and I will expand on this over the next few columns. There is a branch of engineering which many readers will not have heard of even though they deal with it every day of their lives without realising it. It is called Human Factors Engineering, ie. matching technology with human performance and matching human performance with technology. Part of Human Factors Engineering is Ergonomics (matching technology with human performance) and while I think this is important I believe that the other side of the equation is more important (matching human performance with technology).

Large open cut mining equipment supports over A\$100 billion in Australia's export earnings every year. Variations in operator performance have major productivity, maintenance and safety implications for mines. Approximately A\$2 million per dragline per year could be saved by replacing operators who achieve below-average performance with operators who achieve higher productivity and lower damage costs, through better selection and training practices. The opportunity cost for other equipment is less than draglines but still very significant. Different operators perform at different levels but up until recently there had never been a validated method of determining the performance capabilities of individuals (before or after they begin operating). For many operator jobs, the next person-in-line is selected instead of employing effective, standardised procedures to identify prospective 'top' performers for trainee positions.

The part of Human Factors Engineering which I am talking about recognises the individual differences across humans in every physical and mental dimension and that the understanding of these is relevant for good system performance. Such a performance can be optimised by selecting operators who possess the best profile of characteristics for the job.

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To address the shortcomings and to develop an effective selection, development and training tool, a Human Factors Engineering project was undertaken at the University of the Sunshine Coast to support a process which had (and continues to be at many sites) largely been controlled by HR departments. The project investigated whether psychomotor skills (viz., perception, co-ordination); demographic factors (viz., age, experience, etc.); and personality (viz., intelligence, conscientiousness, etc.) could predict operator performance (viz., productivity, maintenance impact and safety). Psychomotor skills, personality and demographics were measured through a computer based testing program called the Vienna Test System (VTS). The end result was the process OPTIMIN™.

I mentioned last week the individual tests which were found to correlate with performance. The real issue here is that for a small time and money commitment you can find out with a high degree of confidence what potential a person has in operating specific mining machinery in a productive and safe manner.

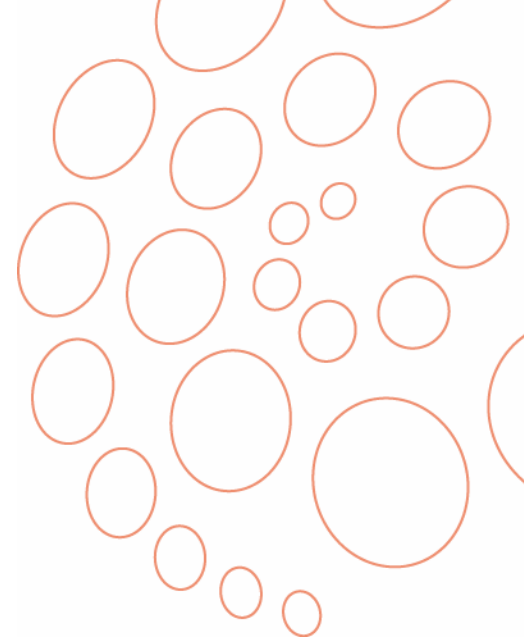
So we have established the first step in optimised equipment performance; selecting the right person. Seems too obvious but most are not doing it well. As an example, the potential of people selected for dragline training in the three years to 2008 was 9% below the potential of people selected 20 years ago (when selection was via seniority) and this is reflected in a 4% drop in potential annual productivity. I can see nothing which would make this picture any different for other equipment. The bottom line is that the people you really want operating are not always being found and this is having a negative impact on productivity.

The reducing operator ability issue flies counter to the improvements which many draglines (and other pieces of equipment) are reporting however it is worth considering where these improvements are coming from.

1. Real process improvements.
2. Better reporting.

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3. Better individual performance, (meeting their potential)
4. Better utilisation of existing capacity.
5. Increased capacity.
6. Adjustments to in-situ SG to make apparent BCM's higher.
7. Adjustments to data.

The reduction in operator ability in the key areas required for productive and safe operation is something which is masked by other process improvements and various "masking" factors, some deliberate and some not.

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