

VEEDRE

White paper series #1

Article summary:

- Human error accounts for 80% of all safety incidents
- The VTS *precisely measures and diagnoses* abilities
- Operators with ability deficits can be rehabilitated with *Ability Optimisation Training*

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Enhancing *cognitive & psychomotor abilities* in Machine Operators & Train Drivers *improves* safety and operational performance

by Denis Hazbic, **VEEDRE** Psychologist and Performance Coach

What if you could enhance or rehabilitate an operator or driver for around 5% of the cost of replacing them?

The philosophy of 'Zero Harm' is **deeply entrenched in many occupational health and safety corporate policies throughout Australia.**

Over the past few decades, Australian organisations have invested significant resources into making the workplace safer through a variety of focus areas. These typically include improvements in workplace and system factors, ergonomic equipment design, work environment, job design, communication and information transfer to help reduce accident and incident rates and improve productivity.

While these efforts have achieved impressive reductions in Australian workplace safety incidents, the less tangible factor of **human error** continues to cause an astounding **80% or more** of all safety incidents. Surprisingly, human factors involved in causing safety incidents are often overlooked or put in the "too hard basket".

"...human error continues to cause an astounding 80% or more of all safety incidents."

The fact remains that individual human factors such as *knowledge, competence, attention, fatigue, concentration, distractibility, stress* and

other *abilities and attributes* are by far the most prevalent contributors leading to safety incidents and sub-optimal job performance.

No one actually goes to work intending to cause an accident or be injured. So why is it, that people from trainees through to experienced workers with a seemingly good attitude towards safety, continue to be injured or involved in incidents' in the workplace?

The decisions and actions made by workers, make sense to them at the time given their expertise, goals and work focus. Yet despite good intentions, workers often commit unsafe acts either unknowingly or knowingly, i.e. they accept a risk due to operational /commercial pressures or make a judgement call that the risk is acceptable.



Image: A rail operator inside a train cabin.



Image: A rail operator inside a vehicle cabin.

The most common unsafe acts:

- **decision based errors** (e.g. continuing to use defective or faulty equipment)
- **skill-based errors** (e.g. omitting required steps in a procedure or taking short cuts)
- **perceptual errors** (e.g. misjudging speed, time and/or distance of mobile plant and equipment); and
- **violation of rules and regulations** (e.g. operating a vehicle at speeds greater than the safety limit).

The most common preconditions of these acts:

- poor **attention** (e.g. multiple types of attention including selective, focused, divided and spatial attention);
- lack or loss of **situational awareness**;
- poor **planning** and **decision making**;
- poor **composure** under pressure; and
- lack of **assertiveness** when communicating.

The Vienna Test System

To address these issues **VEEDRE** uses the scientifically validated **Vienna Test System (VTS)** developed by the Schuhfried Company in Europe. For over 60 years, it has been used extensively in transport and industrial industries across the globe. The VTS enables **VEEDRE** psychologists to *precisely* measure and *diagnose* the *cognitive* and *psychomotor* abilities, which are likely to have led operators or drivers to cause a safety breach or incident.

“The VTS enables **VEEDRE** psychologists to *precisely measure* and *diagnose cognitive* and *psychomotor* abilities...”

The referred operator or driver completes a series of tests designed to assess underlying *cognitive*, *perceptual*, *psychomotor*, *attention* and *predisposition* attributes necessary for safe operation of machinery and/or driving a large vehicle, such as a train. The VTS has customised input devices and response panels for *adaptive computer-based* testing.

These devices are ergonomically designed to replicate operator and driver performance conditions. The diagnostic assessment is *individually customised* to identify or explain possible personal attributes that may have contributed to a particular incident or Signal Passed at Danger (SPAD). The ensuing report presents areas of relative *strengths* and *weaknesses* along with remedial strategies such as in-house training, that can be implemented by the organisation and if required, in collaboration with a **VEEDRE** human performance coach.



Image: The Vienna Test System with response panel and peripheral display panels.

The Ability Optimisation Training Program

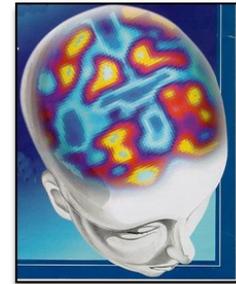
If an operator / driver has been found to have significant *perceptual psychomotor*, or *attention-based ability deficits* that underpin the knowledge and skills required to operate a machine or vehicle, it is recommended they undertake our **Ability Optimisation Training** Program.

The Program typically consists of 12 training sessions undertaken over a 3 to 4 week period. Each session is approximately 60 minutes long, comprising 40 minutes of *computer-based adaptive training*, targeting an individual's *specific ability deficits*, followed by 20 minutes of *face-to-face behavioural coaching* and *reflective practice*.

A **VEEDRE** human performance coach often works with an operator's tutor/supervisor/mentor to develop a competency or monitoring checklist that will serve to bridge the gap between *ability training* and *on-the-job performance* for the operator / driver.

At the completion of the **Ability Optimisation Training**, the operator / driver is immediately re-assessed to determine the degree of improvement in the *targeted* abilities. A comparative report identifies changes between the initial *diagnostic* assessment and the *post-training* assessment. It also provides summary and recommendations sections, which outline specific *on-the-job*, self monitoring activities.

The operator and their supervisor are to then implement these activities into a set of *operating competencies*. This ensures that the individual's *optimised abilities* are fully realized and subsequently demonstrated through *improved* on-the-job *safety and operational performance*.



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Success Statistics

To-date, **VEEDRE** has assessed **111** rail industry operators who were considered **at risk** following a safety breach or incident. After initial VTS diagnostic assessment, 65 of these operators were recommended to undertake the **Ability Optimisation Training** Program, due to ability *deficits* identified in one or more key areas of *attention, focus, situational awareness, stress resilience and decision making*.

- **61 out of 65** of these operators were *successfully rehabilitated* after completing the program and were able to *meet* or *exceed* the necessary *safety critical benchmarks* at post-training assessment. .
- **57 out of 61** operators *maintained* their abilities *improvements* when re-assessed 6 to 12 months post-training, and have since had *no* further safety incidents.
- **4 out 61** who did not maintain the improvements after 12 months, completed a refresher training course and subsequently regained the improvements.

Driving Your Ability Further !

The human brain has incredible recuperative power as well as the flexibility to be enhanced in specific areas of human performance. If given the opportunity, the brain can be re-wired through *scientifically* validated *cognitive training* techniques, which can improve underlying abilities such as *attention* and *concentration*, with long lasting effects. Using *proven cognitive training* technology and *coaching* methods, **VEEDRE** specialises in training operators and drivers to improve their *cognitive* and *psychomotor* abilities, resulting in *safer* and more *productive* on-the-job performance.

Case Study:

Ability Optimisation Training Program — Train Operator

An operator identified by management as having potential deficits in *driving behaviour* and *operational performance*, following a series of SPADs (Signal Passed at Danger) in a short timeframe, was referred to **VEEDRE** for *diagnostic* assessment of *at-risk* abilities.

Results revealed sufficient (average) scores across cognitive areas such as *problem solving*, *verbal reasoning* and *visuospatial memory* and there were no *safety orientation/attitude* concerns. However, the operator scored in the deficit range (below 16th percentile) in the areas of *situational awareness*, *visual selective & focused* and *divided attention*.



Based on these results the operator undertook a 12 session training program specifically *targeting* the deficit areas.

Using *computer-based ability training*, *behavioural coaching* (e.g. mindfulness, energy management, verbal and physical cueing, greater task immersion,

transitioning between broad and narrow focus of attention, etc) and *reflective practice*.

Results

At the completion of the program the operator was re-assessed on the *deficit* areas and an *average* or *higher* score was achieved across *all abilities*.

Re-assessment results 12 months post training, showed the improvements made were *sustained*, due to the continued use of self monitoring and attention management techniques, learnt during training.

Most importantly, the operator has not had a single incident since (24 months post training).

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Driving Your Ability Further!