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EXCELLENCE IN RAIL SAFETY WORKER COMPETENCE

SUMMARY

Transport Construction Authority decided to develop a system to identify rail safety workers and to assess their competency and fitness to undertake rail safety work. The new Competency Management System to assess rail safety workers has resulted in robust outcomes that are not only applied across TCA but to contractors and delivery, supply and service partners. Its application in the project delivery environment has been validated by TCA's excellent safety record which continues to surpass industry standards.

NOTATION

RSW	Rail Safety Work
RSWs	Rail Safety Worker/s
TCA	NSW Transport Construction Authority
RSS	Rail Systems Solutions Pty Limited
AQF	Australian Quality in Training Framework
TIDC	Transport Infrastructure Development Corporation

INTRODUCTION

Rail industry operators, contractors and suppliers have, since 2008, been required to comply with the provisions of the NSW Rail Safety Act. There has been extensive dialogue as to what constitutes rail safety work, the identification of rail safety workers and the extent of validating competency of rail safety workers. While Section 7 of the Act sets out what rail safety work is, it is still very broad and open to interpretation, particularly if not considered within the Act as a whole. This has been particularly apparent so far as design houses are concerned.

NSW Transport Construction Authority (TCA) decided to develop a systematic approach to genuine identification of rail safety workers and to undertake a competency assessment process that would deliver the most robust outcomes for validation of competency and fitness to undertake rail safety work. TCA's position is that only those who truly met the definitions of rail safety work would be assessed so as to ensure that the process of meeting the requirements of the Act did not add undue expense and place an impost on organisations that may result in them being forced out of the industry.

TCA's overarching position was to ensure full and transparent compliance with the Act, develop greater understanding of what rail safety work really is, provide a straightforward approach to identifying and assessing individuals as competent to undertake their work, and encourage new operators to consider entering the industry.

In 2010, TCA made a conscious decision to bring together a Competency Project Taskforce, sourced from several specialist areas in rail, construction, training and assessment, and systems management. The taskforce was charged with the responsibility of liaising, advising, designing, assessing and delivering TCA to full compliance under the Act by 1 January 2011 in accordance with their accreditation as a rail transport operator.

RAIL SAFETY ACT 2008

The introduction of the NSW Rail Safety Act 2008 requires all rail transport operators, rolling stock operators and rail infrastructure managers to comply with the Act by identifying those individuals engaged in rail safety work. Further, there is a requirement to demonstrate competency of rail safety workers within the definitions of the Act to the satisfaction of the Independent Transport Safety Regulator.

Identifying, determining and validating who is a rail safety worker as defined within Section 7 the Act proved to be the most difficult element, made even more complex by the Act not being supported by a Regulation or Code of Practice to provide clear parameters around the analysis of rail safety work.

LESSONS LEARNED

The first initiative was to undertake the assessment process based on competency aligned with the Australian Quality Framework. The assessment process was developed around a web-based assessment, which quickly manifest as not being appropriate. The process was time consuming for candidates but, even more concerning, was that it did not deliver any credible evidence on how to assess attitude and daily behaviour in relation to safety and risk management (fitness for work). A decision to change direction to a competency based assessment immediately demonstrated the required outcomes and was subsequently adopted and implemented by TCA in September 2010.

The Taskforce was accountable to TCA's General Manager Safety & Quality but a significant challenge was encountered in convincing all stakeholders the path to be taken was correct and applicable to tick all the boxes.

ASSESSING COMPETENCIES

Skills based

Competence is defined as the ability to undertake responsibilities and to perform activities to a recognised standard on a regular basis. Competence is a combination of practical and thinking skills, experience and knowledge and, when coupled to behaviours and fitness, allows work activities to be undertaken in accordance with agreed standards. In combination, these aspects help to provide an individual and/or a team with the judgement required to carry out rail safety work and the associated tasks.

Competence can also be affected by the operational conditions, context and environment in which the safety tasks are performed and by the prevailing safety culture within an organisation.

Many tasks require more skills and knowledge than one individual possesses. In these cases, the tasks are undertaken by a team, making it necessary to specify the required collective competence for that team. Therefore, rail safety work team competence needed to be considered along with individual competence. TCA needed to make sure that all personnel are competent to fulfil their safety responsibility and that all of their people can work together effectively to deliver project safety and safe infrastructure.

Competence can be viewed as a continuum, with people being at various stages of competence along the continuum. Therefore, the need to develop and manage a mentoring process was also identified. These stages can be described as novice, not yet competent, competent, proficient and expert.

The progressive and ongoing approach assures an effective and consistent performance from an individual or team. When people undertake new tasks or advance to higher duties, they will, to some extent, be unaware at transition of their own true abilities. This is known as "unconscious incompetence".

Through mentoring and learning and development, candidates will advance to the stage of knowing what they don't know, which is "conscious incompetence".

Individuals can learn to complete a task. Initially, they need to think consciously about the task in order to perform at a competent level. This is called "conscious competence".

As people perform tasks they gain experience and competence in completing the task increasing efficiency and productivity. Most people reach a level of almost automatic performance, where the only significant recall on their underpinning knowledge and experience will occur when they have to deal with extreme abnormal situations or an emergency. This is known as "unconscious competence".

However, there is a real risk that people can unwittingly regress returning to a level of "unconscious incompetence".

To avoid this, a system of continuous monitoring, assessment and reassessment of performance and competence is required and should include individuals, and validation audits and system reviews at an organisational level to ensure competence requirements are identified, validated, verified and managed.

A key component for safety working and working safely is the application of sound judgement. Judgement is the cognitive process for reaching a decision or drawing a conclusion.

An individual's or team's judgement is the cognitive process of the mind, involving comparison and discrimination. In this process, knowledge and previous experience of the value and relationship of things, whether it relates to safety, moral quality, legal requirement, intellectual concept, logical proposition or material fact, is obtained to make a decision or determine a course of action.

Behaviour and attitude along with the overall fitness of a person can have an effect on the exercise of judgement. In understanding behaviour and attitudes, it is important to look at an individual's approach to safety. To examine their attitude toward risk, we must consider and assess their mindset, self- management and control of emotional responses (eg. stress, anger or other negative responses), motivation, general leadership, management, teamwork and communication, as these can all have an effect on judgement and safety performance. It is important to establish fitness that enables work to be carried out competently and to reduce, as far as possible, the risk of pre-existing conditions, disabilities and any other factors which could compromise the safety of the individual, others in the workplace or the public.

The term "fitness" encompasses the interrelated areas of physical, mental and medical fitness.

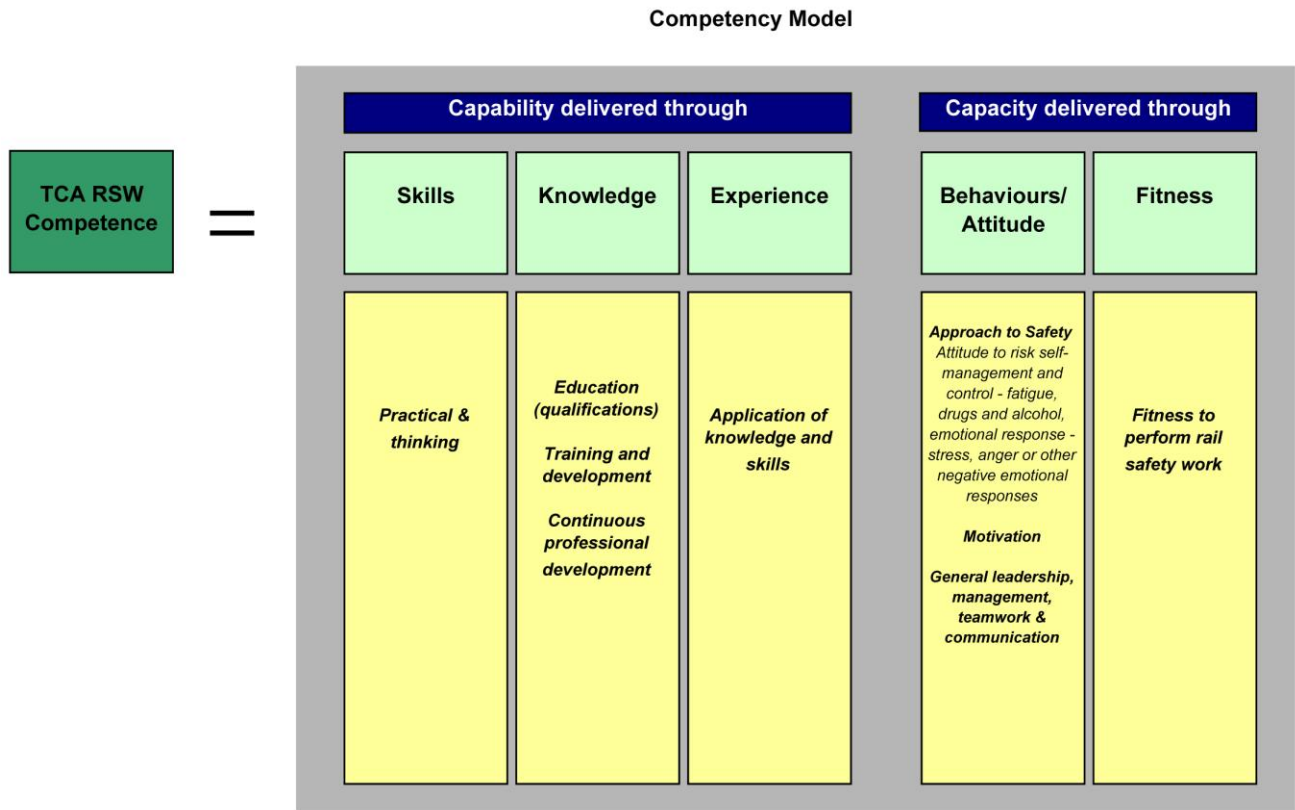
Physical fitness standards are required in order to determine an individual's physical capability to perform a task to expectation safely.

Mental fitness implies that there are no existing psychological conditions that may adversely affect concentration, decision making or behaviour which could compromise competence and safety.

Fitness may be impaired through drugs (i.e. prescribed, non-prescription, illicit), alcohol and fatigue, all of which can adversely affect competence and safety.

The following competence model takes into consideration all the factors mentioned to provide the basis for developing and maintaining competence and has been applied across TCA.

All of the components of the model, when developed and practised, will assist in developing good judgement on safety and risk-related matters.



Risk based

Many rail organisations throughout the world have used qualification frameworks and/or vocational standards as the baseline for establishing, defining and measuring competence.

Whilst this approach does provide benefits, using it as a primary driver and method of competency assessment can also have significant drawbacks. This is apparent in a high-risk industry, such as rail, where safety requires constant assessment and assurance, as the environment, conditions and context are subject to change, altering the risks the business and individuals face, whether through the lifecycle of a project or in everyday rail operations and maintenance.

Drawbacks can include:

- assessments not being risk based – low-importance issues are treated equally to those of high importance
- being generic – they do not necessarily address industry specific or local requirements
- undertaking great effort to collate evidence for generic treatment, which can be disproportionate in terms of establishing and improving safety working attributes.

The following table provides a high-level view of the two approaches.

Qualification/Vocational Approach to Competence	Risk Based Approach to Competence
Based on generic national standards	Based on organisation and activity risk
Complex documentation for assessment	Easier documentation
Single pre-announced assessment encounter	Continuous assessment & ongoing development
Evidence based on observation and questions	Range of assessment methods
Can lead to qualification	Can lead to qualification

While qualifications provide a basis to demonstrate prior learning and knowledge as well as training and development, they need to be incorporated into a risk-based competency management system. The risk-based approach will assure the business and the individuals within it that constant review of the environment, conditions, context and the resulting risk exposure will constantly identify the response required to provide a continuous, consistent approach to maintain competency.

COMPETENCY ASSESSMENTS AND MANAGEMENT SYSTEMS

TCA contracted Rail Systems Solutions Pty Ltd to undertake assessments and system validation audits.

In-house assessments were undertaken by developing an assessment validation document that captured relevant personal, academic, health and safety and rail safety competencies, general industry and rail specific experience. The document also asked a number of questions relating to rail safety and risk management competencies. For all levels of responsibility, there were specific questions relating to safety, risk management, standards, policy and procedures applicable to each job description.

Assessments started with senior technical personnel within TCA. Once a senior member within a business unit had been assessed, they were then competent to undertake responsibility as subject matter expert for the rail safety workers either reporting to them directly or indirectly.

By 31 December 2010, 131 individual assessments had been conducted and certified competent over a 10-week period. Of the 131 candidates interviewed, 15 were referred for further assessment before being deemed competent. A major strategy was to ensure all rail safety workers were competent without compromise and, in doing so, a continuing focus is to mentor individuals and to grow their practical skills, developing an enhanced workplace culture benchmarked on a fundamental foundation of "Safety First".

Assessments were divided into two categories – Engineering/Safety and Management. It was determined through the risk-analysis process at the outset that Engineering and Safety carried greater risk elements than a Management responsibility for the purpose of assessments. Therefore, Engineering or Safety Operative competencies are only valid for two years where a Management based competency is valid for four years, at which time, competencies will be reassessed to ensure currency and consistency under "conscious competency".

Reviews of the competency management systems of nine of TCA's current delivery partners were conducted at the end of 2010. Eight of the nine were found to have robust systems for assessing competencies of individuals engaged in their business.

One delivery partner had an existing system which was found to be lacking in several areas when tested for validation. TCA took the approach of providing further assistance to the delivery partner by allocating resources to guide and assist them in enhancing their systems and methodologies to satisfy benchmark levels of compliance with the Act and TCA's requirements to ensure effective compliance with their accreditation as a rail transport operator.

Since the initial review of delivery partner Competency Management Systems, a further review has been conducted involving 13 major clients. Evidence demonstrates ongoing improvement in competency assessments, systems and compliance requirements to meet TCA expectations and the provisions of the Rail Safety Act.

COMPETENCE GOALS

A general principle for safety and competence is the work and tasks that create risk should be delegated to those who are accountable and/or responsible for managing the risk in so far as reasonably practicable. The resulting Competence Management System is a risk-based approach.

The principle of rail safety and competence is accountability and/or responsibility should be an integral part of the responsibilities of general leadership and management and not be segregated as responsibilities of other areas. Risk management covers all areas of every business activity.

In order to prove and demonstrate competency, competency needs to be assessed but the process for assessment is critical in assuring competency. For an assessment to be effective, it needs to take place at:

- an organisational level to assure all the safety requirements and responsibilities have been captured within the organisational structure and are reflected in position descriptions and
- an individual level to assure the occupant of the position is competent to undertake the role and deliver the level of responsibility demanded by the level of accountability in the position.

The following competence goals when applied in the business will assist with assuring this is achieved.

Competency goal 1 - Identify rail safety work, tasks and assess risks

Identify the work activities and assess the associated risks to determine those which have the potential to affect rail safety.

Competency goal 2 – Select a standard

Select or develop standards to ensure that the identified risks are controlled consistently.

Competency goal 3 – Develop processes, procedures and methods

Quality assurance processes, procedures and methods should be developed which are designed to ensure the Competence Management System consistently achieves the intended results.

Competence goal 4 – Decide how to meet the standards

Establish the most suitable methods for the assessment and ongoing development of staff in order to meet the required levels of competence.

Competence goal 5 – Establish learning and development needs

Establish the training and development needs and competence requirements of staff, recruits and managers through skills gap analysis matrix.

Competence goal 6 – Maintain managers' competencies

Maintain the competence of the managers operating the Competence Management System and ensure that they understand their responsibilities.

Competence goal 7 – Select and recruit staff

Staff should be recruited and selected using suitable selection standards and methods and clearly identified minimum competency essentials combining skills and experience.

Competence goal 8 – Train, develop and assess staff

Train, develop and assess the competencies of existing staff and new recruits using methods appropriate to the relevant competence standards.

Competence goal 9 – Manage the activities undertaken

Control processes should be established to assure that staff and contractors are only asked to undertake work for which they have been assessed as competent to undertake.

Competence goal 10 – Monitor and re-assess staff performance

Monitor and reassess the competence of staff to ensure performance is being consistently maintained and developed.

Competence goal 11 – Update competence of individuals

Update the competence of individuals in response to all relevant changes. Competency assessments must be amended to include changes in responsibility or position descriptions, prior to appointment.

Competence goal 12 – Manage sub-standard performance

Identify sub-standard performance and restore competence through effective learning and development and mentoring.

Competence goal 13 – Keep records

Maintain adequate records of assessments and make them available on request. A vital component of any competency assessment is to have a robust Competency Management System to underpin the documentation of processes and outcomes.

Competence goal 14 – Verify and Audit the Competency Management System

Verify and audit the Competency Management System through scheduled auditing and compliance testing.

Competence goal 15 – Review and feedback

Review and analyse safety performance data and any process feedback into the Competency Management System.

TENDERS, CONTRACTS AND PROCUREMENT

Industry awareness in understanding the definition of rail safety worker was and still is at best confused and fragmented. TCA has embarked on a process of guiding suppliers on how to identify and certify rail safety workers as competent in order to comply with legislative requirements. Tender, contract and procurement documentation and information makes it very clear that rail safety workers need to be compliant with the Act.

TCA is providing the means and in some cases the resources to either validate a supply partner's own Competency Management System or assisting by conducting the assessments of individuals where the supplier has no Competency Management System.

It is TCA's philosophy to encourage not discourage new supply partners, whether large or small, to operate within the rail industry. This is reinforced with a mentoring approach, including up-skilling resources for the benefit of the industry as a whole.

INDUSTRY LEADERSHIP IN COMPLIANCE

TCA's approach to complying with the Rail Safety Act 2008 includes setting benchmarks in defining and validating competencies for all personnel not just rail safety workers specifically. This establishes TCA as an organisation of excellence, delivering world-class projects to the NSW with the highest safety standards and practices as reasonably practicable through design, technology, construction, commissioning, operation, maintenance and decommissioning.

TCA believes the chosen path will continue to deliver excellence within the industry. TCA is already identified as an industry leader through its practice of liaising and networking with other transport and utility industry bodies and assisting them in their efforts to achieve excellence in safety. The Safety Management System model and Competency Management System methodology is being adopted across the transport portfolio in NSW, in the end delivering better transport services to the state of NSW.

STRETCHING FOR EXCELLENCE

After the Competency Management System for rail safety workers had been implemented, TCA undertook a review to identify common issues and opportunities for improvement. The issue of setting the minimum training requirements was noted as being out-of-date within Version 3 of the Safety Management System and not aligned with the rail safety worker competency regime. The rail safety worker competence regime sets out five levels of competence.

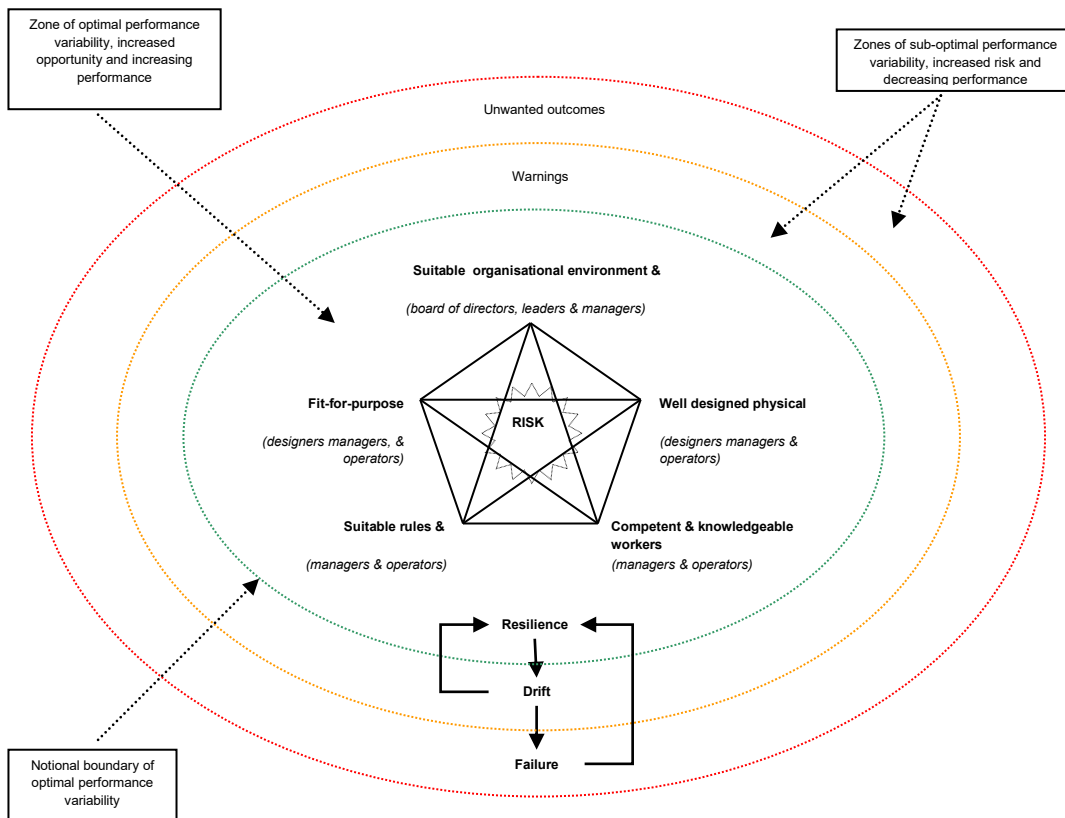
5 LEVELS OF COMPETENCE
Executive Leadership
Senior Managers
Project Managers & Technical Managers
Supervisors
Frontline Employees

The work to define these levels has been drafted, building upon the inputs from the Ballarat University report and is attached to this paper as attachment A.

These competence levels need to be underpinned by a training regime to assure TCA has the right knowledge, skills, experience, behaviour/attitudes and fitness to discharge its obligations. A gap analysis of current versus proposed skill sets has been completed.

Ballarat University report

The report on “Frontiers of thinking about managing safety” was presented to the TIDC Board and the Health, Safety and Environment Committee in the summer of 2009. This set out the potential opportunities for future safety management and introduced concepts, such as collective mindfulness and resilience engineering, along with a model for organisational elasticity and performance. One of the five pillars of this model is competent and knowledgeable people.



The report also introduced Hollnagel’s Theory W and Theory Z, which is summarised in the following table.

Theory W : Managerial perspective (technological optimism)	Theory Z: Systemic perspective (technological realism)
Things go right because: Systems are well designed and scrupulously maintained Procedures are complete and correct People behave as they are expected to – as they are taught Designers can foresee and anticipate every contingency	Things go right because people: Learn to overcome design flaws and functional glitches Adapt their performance to meet demands Interpret and apply procedures to match conditions Can detect and correct when things go wrong
Humans are a liability and variability is a threat. The purpose of design is to constrain variability, so that efficiency can be maintained.	Humans are an asset without which the proper functioning of modern technological systems would be impossible.

CONCLUSION

With the new Competency Management System in place at TCA for just over one year, it is still early days to assess the full impact of the systemic approach across all TCA projects. However, TCA can now guarantee and place full confidence in the assurance of the quality of its system, processes and personnel. It is already apparent that there is greater consistency in the identification of rail safety workers and the application of assessment processes across all TCA projects.

We have also seen the Competency Management System make a positive contribution on how we assure the Competency Management Systems of our delivery partners. TCA through our regular industry safety forums have promoted the benefits of the systemic approach to other rail transport operators and shared our learning and experiences across the industry in the hope that all operators in NSW will take on board the excellence of our rail safety worker Competency Management System.