HSE
Health & Safety Executive

Recruiting safe employees for safety-critical roles

Prepared by the **Occupational Psychology Centre Limited**
for the Health and Safety Executive 2004

RESEARCH REPORT 271

HSE
Health & Safety Executive

Recruiting safe employees for safety-critical roles

Dr Stephen Fletcher
The Occupational Psychology Centre
One Wellstones
Watford
Herts
WD17 2AE

This document summarises an innovative research project undertaken by psychologists from the Occupational Psychology Centre (OPC) on behalf of Her Majesty' s Railway Inspectorate (HMRI). The study involved piloting a selection process for safety-critical employees within the UK rail industry. The process was piloted with employees working on the track and it involved:

- identifying the key characteristics required for safe and effective performance in a range of safety-critical activities undertaken on the track that have not previously been analysed;
- selecting suitable assessment tools to measure these key characteristics;
- trialling these assessment tools with track worker applicants and existing track workers; and,
- validating the assessment tools by demonstrating, wherever possible, the link between performance on the assessment tools and performance in training and on the job, including safety performance.

This report and the work it describes were funded by the Health and Safety Executive (HSE). Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect HSE policy.

HSE BOOKS

First published 2004

ISBN 0 7176 2901 5

Contents

Executive Summary

This document summarises an innovative research project undertaken by psychologists from the Occupational Psychology Centre (OPC) on behalf of Her Majesty's Railway Inspectorate (HMRI). The study involved piloting a selection process for safety-critical employees within the UK rail industry. The process was piloted with employees working on the track and it involved:

- identifying the key characteristics required for safe and effective performance in a range of safety-critical activities undertaken on the track that have not previously been analysed;
- selecting suitable assessment tools to measure these key characteristics;
- trialling these assessment tools with track worker applicants and existing track workers; and,
- validating the assessment tools by demonstrating, wherever possible, the link between performance on the assessment tools and performance in training and on the job, including safety performance.

The results demonstrated that scores on a range of assessment tools, including a work sample, concentration and safety personality questionnaire, were linked to performance in track training. The results also demonstrated that scores on the work sample test, verbal ability, concentration and safety personality questionnaire were linked to success on the job, and linked to safety performance in the case of the concentration test. In both studies the findings are modest and are reported as preliminary, they need to be treated with caution but are an encouraging first step.

The support from across the rail industry was not particularly forthcoming and as a result the methodology employed was restricted and the sample sizes were limited. Therefore the implications and conclusions need to be interpreted with a high degree of caution. However the study does provide a very important first step with regard to the safe and effective recruitment of track workers.

This study has some important implications for how the UK rail industry recruits, and trains its track workers.

Acknowledgements

The OPC would like to thank the HSE, and Chris Kelly in particular, for the support for this project given the challenges it has faced throughout its life.

The OPC would also like to acknowledge the continued help and support from Amec Rail during this project. The OPC would like to thank in particular Alan Barnes, Christine Hardy and Russell Suart. Without their continued support and their considerable investments of time and resource this key project would not have been completed or successful.

Background

The rationale for the research project

In 1999 the Health and Safety Executive (HSE) issued a tender document to examine the personal competencies required by safety-critical workers. The HSE, and more specifically Her Majesty's Railway Inspectorate (HMRI), had undertaken some key work around competence management and assurance within the rail industry. A working group of the Health and Safety Commission's Railway Industry Advisory Committee was set up. This working group was tasked with providing guidance around competence management and assurance within the rail industry. From this working group a draft report was prepared titled 'Railway Safety Principles and Guidance. Guidance on Competence Management and Assurance Part 4, Section C'.

This key document identified a management and assurance system for the railway that consisted of 15 principles. These 15 principles covered, but were not limited to, training, re-assessment and monitoring, records and recruitment and selection. These principles were organised around five phases, ie:

1. establish requirements;
2. design system;
3. implementation;
4. maintain competence; and,
5. audit and review.

The HMRI were fully aware of the importance of recruitment and selection in helping to maintain competence within the rail industry. An employer could have excellent training, competence monitoring on the job and audit procedures. However, the effectiveness of these systems would always be limited by the quality of the safety-critical employee recruited in the first place. That is why recruitment and selection are absolutely key in helping to maintain competence assurance and management. If the recruitment and selection processes are effective then there is a better chance that they will deliver to the rail industry employees who will be easier to train, more effective in training and who will be more effective and safer on the job. These employees are also more likely to benefit from the competence assurance programme that is operated by the organisation.

Key research for and around selection for safety-critical roles

In 1999, and at the time of the awarding of the contract, the HMRI were fully aware of some key work the psychologists from the Occupational Psychology Centre (OPC) had undertaken whilst they were part of the British Railways Board, and more recently as a limited company. The OPC's work had centred upon the recruitment and selection processes for key safety-critical roles within the rail industry. In particular this work was around train drivers. The OPC's research had shown that a rigorous selection process for train driver applicants involving psychological tests and exercises was delivering to the industry more effective trainees, and more importantly, safe and effective train drivers in the job.

Proving a recruitment model to the rail industry

The HMRI were keen to extend this research to other sectors of the rail industry involving the recruitment of safety-critical employees. The aim was to undertake a pilot programme that would deliver to the industry an effective and robust process for recruiting and selecting safety-critical employees.

The pilot would provide a model for the rail industry to use when it recruits any safety-critical employee. For example the model would outline the key stages involved in putting together an effective and robust selection process for recruiting safety-critical employees. In addition, as part of the pilot programme, the model would be used with a small number of key work roles taken from the industry. This would involve going through the key stages and developing a robust and effective selection process for these key safety-critical activities within the rail industry.

Therefore the pilot had two main aims. One was to demonstrate the key stages involved in putting together a robust selection process for safety-critical employees. The second was to develop and trial an effective selection process for a handful of safety-critical roles within the industry.

In 1999 the Health and Safety Executive, on behalf of the HMRI, issued a tender document for undertaking this pilot programme. The OPC were successful in being awarded the contract.

The Stages of the Pilot Project

This pilot project had a number of key stages. They were:

Stage 1: Work with key industry stakeholders to decide what key safety-critical activities to include as part of the pilot programme.

Stage 2: Undertake job analysis for the chosen safety-critical activities to identify the key characteristics required for success.

Stage 3: Selecting suitable assessment tools to measure the key characteristics required for success within each role.

Stage 4: Trial the assessment tools to examine their effectiveness. This would involve collecting candidate data on the tests and then on-the-job performance data for each candidate within the rail industry.

Stage 5: Analyse the data and make recommendations to the HMRI regarding the recruitment of safety-critical personnel in general, and the recruitment specifically of those safety-critical roles included within the pilot study.

The structure of this report

This report is organised around the five key stages listed above. It includes the work that was undertaken and the findings that emerged. Some of the technical detail and data for each stage is incorporated into the Appendices.

Stage 1: Work with Key Industry Stakeholders to Decide What Key Safety-Critical Activities to Include as Part of the Pilot Programme

The HMRI were keen to ensure that the pilot programme was undertaken with the full support of the rail industry. Furthermore the HMRI wanted to ensure that the key work roles that would have selection processes designed for them as part of the pilot were those roles that the industry considered to be the most pertinent and important.

Therefore the involvement of the key stakeholders from within the industry was critical. The OPC, in conjunction with a representative from the HMRI, ran a workshop in 2000 with key stakeholders from across the industry. This included, but was not limited to, representatives from Train Operating Companies (TOC's), maintenance organisations and Railtrack (now known as Network Rail).

At the workshop the OPC explained:

- the aim of the workshop;
- the stages of the project; and,
- the need to select safety-critical activities for inclusion within the pilot project.

The delegates were asked to select the safety-critical activities to include as part of the pilot project. As part of this work delegates chose safety-critical activities and not safety-critical roles. This was because the former were not role specific and were more generic. Different rail organisations have different names for similar jobs, so to reduce confusion the focus was on safety-critical activities that are generic and universal across the rail industry.

To assist delegates in selecting suitable safety-critical activities they used the draft document 'Railway Safety-Critical Work' dated 12 April 1999. This key document summarised over 42 safety-critical activities undertaken by safety-critical personnel within the industry. This document was used by the delegates as a source document to ensure that the choice of the safety activities for the pilot was based on a comprehensive understanding of safety-critical activities from across the industry.

Criteria for selecting safety-critical activities

The workshop delegates used a number of criteria to determine what safety-critical activities to include within the pilot programme. These criteria were not necessarily mutual exclusive. These included:

- **importance** – this is the perceived importance of the safety-critical activity within the industry;
- **safety risk** – based on past experience delegates were able to ascertain that some safety-critical activities were of greater or lesser safety risk;
- **frequency of use** – delegates wanted to ensure that the safety-critical activities used as part of the pilot were widely used across the industry, thereby helping the pilot programme to have maximum impact;
- **practical/achievable** and providing **quick wins** – this is where the piloting would be relatively easy to undertake;
- **sizeable population** of applicants and/or employees to assist with the trialing; and,
- **known problem area** – this is where delegates believed that the recruitment and selection for a safety-critical activity has, in the past, posed a problem, and could benefit from some development.

The safety-critical activities selected for the pilot programme

The safety-critical activities selected as part of the pilot programme were as follows:

Protecting persons – protecting persons working in a maintenance capacity on or near the line. This work role is now referred to as COSS – Person in Charge of Site Safety. This activity was categorised as D2 in the document 'Railway Safety-Critical Work'.

Controlling the movement of trains in and out of a possession - this is the work role now referred to as PICOP – Person in Charge of Possession. This activity was categorised as D6 and D7 in 'Railway Safety-Critical Work'.

Isolating the traction supply - this involves isolating the traction supply for maintenance, repair or alteration of any means of supplying electricity to vehicles. This activity was categorised as K3 in 'Railway Safety-Critical Work'.

Inspecting track - this activity can include identifying dangerous track defects that require trains to be stopped. This activity is often carried out by the job of the Patrolman and is categorised as F1 in 'Railway Safety-Critical Work'.

All of the activities selected were those based around working on the track. These were the activities that the delegates believed would benefit most from inclusion as part of the pilot programme.

Stage 2: Undertake Job Analysis for the Chosen Safety-Critical Activities to Identify the Key Characteristics Required for Success

Once the safety-critical activities had been identified then the next stage involved undertaking job analysis. Each activity would be analysed to help derive the personal characteristics, ie, the abilities, skills, personality and motivations required for safe and effective performance within each activity.

Stage 2 involved the OPC running a focus group with job experts. These job experts were selected for their in-depth knowledge of one or more of the chosen safety-critical activities. They were drawn primarily from the maintenance companies, sub contractor maintenance organisations and Railtrack.

The job analysis consisted of inviting the job experts to a one day workshop. At the workshop the job experts completed and took part in a number of job analysis exercises for each safety-critical activity. The job analysis exercises included:

- a group exercise – brainstorming the key tasks within each safety-critical activity;
- completion of job analysis questionnaires – two questionnaires were used, OPC Assessment's Safety Job Analysis Questionnaire for safety-critical roles and Saville and Holdsworth's Work Profiling System for manual and operative work roles. Both of these questionnaires are designed to elicit from job experts the key tasks, skills and activities required for safe and effective performance within each safety-critical activity; and,
- critical incident interviews – this consisted of the OPC psychologists questioning job experts about examples when the employee undertaking the safety-critical activity performed effectively and/or performed ineffectively. The Critical Incident Technique is a particularly powerful tool for eliciting the key behaviours required within a work role.

A variety of job analysis techniques were used because they included both qualitative and quantitative methods, and each has its own strengths and weaknesses regarding profiling a work role.

Collating and summarising the outputs from the job analysis workshop

Following the workshop the OPC psychologists then collated and collected the information and data collected for each safety-critical activity. The aim was to draw up a list of personal characteristics required for each safety-critical activity. Each personal characteristic was also defined in full (see later).

Checking out and validating the personal characteristics for each key safety-critical activity

Once the OPC had determined the personal characteristics then a second workshop was run with job experts. These job experts were, in general, different to those who had attended the job analysis workshop. They were asked to review the personal characteristics for each safety-critical work role. This was to check out:

- the relevance of each personal characteristic to the safety-critical activity role;
- any omissions; and,
- make any recommendations for change.

The feedback was positive and the characteristics only required minor modifications, eg, word changes. This was particularly encouraging and validated the accuracy of the job analysis workshop and the 'outputs' from this session collated by the OPC.

The workshop was then also asked to determine the relative importance of each characteristic to each safety-critical activity. This was to ascertain if each characteristic was either essential or desirable for effective and safe performance.

The personal characteristics required for each safety-critical activity

The four safety-critical activities that were being used as part of the pilot were all about track working and they were similar in nature. Therefore, the personal characteristics that were identified as part of the job analysis were similar across these four safety-critical activities.

The personal characteristics and their relevance to each safety-critical activity are given in Table 1 (see overleaf).

It will be seen from Table 1 that the set of 12 personal characteristics are, in general, relevant to all four safety-critical activities. In addition the characteristics include both ability, personality and motivational characteristics that are all key to effective and safe performance.

As indicated earlier each personal characteristic was defined in full. These are listed in Appendix 1.

Table 2 lists the essential/desirable nature of each characteristic to each of the four safety-critical activities. A review of Table 2 reveals that the majority of the characteristics are identified as essential.

Summary from stage 2

The job analysis identified some key characteristics that are required for success within a number of key safety roles within the rail industry. This has been an important stage of the project. It is a key foundation stage for the design of the selection process that is outlined later in this document. It is also the first time a comprehensive job analysis has been undertaken for these safety-critical activities on the track. The analysis provides the industry with some very important information that can be used to inform track work selection processes, but also training, personal development and on the job competence assessment for these key roles.

Personal Characteristics	F1 Inspecting Track	D2 Protecting Persons	D6/D7 Controlling the Movement of Trains	K3 Isolating the Traction Supply
Ability and skills				
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.	✓	✓	✓	✓
2. Analyse, understand and work with verbal information.	✓	✓	✓	✓
3. Undertake and complete clerical and administrative tasks.	✓	✓	✓	✓
4. Ability to work with a range of different equipment and tools.	✓			✓
5. Introduce effective plans and make appropriate decisions.		✓	✓	✓
6. Remain vigilant and attentive for safety hazards or incidents.	✓	✓	✓	✓
Working with others				
7. Communicates effectively with others.		✓	✓	✓
8. Manage and control others with confidence and assertiveness.		✓	✓	✓
9. Establish and maintain effective relationships with others and propagate team working.		✓	✓	✓
Motivations				
10. Motivated to follow rules and procedures.	✓	✓	✓	✓
11. Undertakes careful checks at all times.	✓	✓	✓	✓
Emotions				
12. Manages emergency and unexpected situations.	✓	✓	✓	✓

Table 1: The relevance of the personal characteristics to the four safety-critical activities included as part of the pilot.

The essential and desirable nature of the personal characteristics

The essential and desirable nature of the personal characteristics are displayed in Table 2 below.

Personal Characteristics	F1 Inspecting Track	D2 Protecting Persons	D6/D7 Controlling the Movement of Trains	K3 Isolating the Traction Supply
Ability and skills				
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.				
2. Analyse, understand and work with verbal information.				
3. Undertake and complete clerical and administrative tasks.				
4. Ability to work with a range of different equipment and tools.				
5. Introduce effective plans and make appropriate decisions.				
6. Remain vigilant and attentive for safety hazards or incidents.				
Working with others				
7. Communicates effectively with others.				
8. Manages and controls others with confidence and assertivenss.				
9. Establish and maintain effective relationships with others and propagate team working.				
Motivations				
10. Motivated to follow rules and procedures.				
11. Undertakes careful checks at all times.				
Emotions				
12. Manages emergency and unexpected situations.				

Key Essential Desirable Dependent on role

Table 2: The essential/desirable nature of each characteristic to each safety-critical activity.

Stage 3: Selecting Suitable Assessment Tools

Following the development of the personal characteristics the next stage of the pilot project was to identify suitable assessment tools to assess each characteristic. These assessment tools could then be utilised within the pilot study to help determine their effectiveness.

In the first instance the OPC psychologists identified different types of assessment tool that could be used to tap into and measure each personal characteristic. These are given in the assessment matrix in Table 3 overleaf.

Assessment Tools / Personal Characteristics	Interview	Personality Questionnaire	Group Exercise	Verbal Test	Concentration Test	Planning Test	Work Sample/ Ability Exercise	Administrative Work Sample Exercise
Ability and skills								
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams and reason with information.							✓	
2. Analyse, understand and work with verbal information.				✓				
3. Undertake and complete clerical and administrative tasks.								✓
4. Ability to work with a range of different equipment and tools.	✓							
5. Introduce effective plans and make appropriate decisions.						✓		
6. Remain vigilant and attentive for safety hazards or incidents.					✓			
Working with others								
7. Communicates effectively with others.	✓		✓					
8. Manage and control others with confidence and assertiveness.	✓	✓	✓					
9. Establish and maintain effective relationships with others and propagate team working.	✓	✓	✓					
Motivations								
10. Motivated to follow rules and procedures.	✓	✓						
11. Undertakes careful checks at all times.	✓	✓						✓
Emotions								
12. Manages emergency and unexpected situations.	✓	✓						

Table 3: Types of assessment tools to assess the key personal characteristics.

Table 3 indicates that a range of assessment tools were recommended for the different characteristics required for the safety-critical activities. The OPC recommended ability tests to assess characteristics numbered 1, 2, 3, 5, and 6, and the personality and motivational characteristics could be assessed via the use of interview, personality and a group exercise for the more interpersonal characteristics, ie, characteristic no. 8: (Manage others with confidence); 9: (Establish and maintain effective relations); and, 7: (Communicates effectively).

Identifying specific assessment tools

The OPC then identified specific assessment tools to assess the different characteristics. These included off-the-shelf assessment tools from the UK and the Continental European test market. It also included bespoke assessment tools where off-the-shelf were not available or did not closely match the key personal characteristic. The assessment tools that were identified by the OPC are listed in Table 4 (overleaf). However there may be other assessment tools not identified here that may also be of benefit. Those tools that were used as part of the pilot are discussed below.

The criteria that were used to select the assessment tools

The selection of the final list of assessment tools to use in the pilot was undertaken using some key criteria. They would help to determine the suitability and practicality of each assessment tool. The criteria were:

1. The psychometric properties of the short-listed assessment tools including their reliability and validity.
2. The practicalities of using the assessment tool as part of the research project and/or in a selection context e.g. how easy would it be to use the assessment tool in a selection context?
3. Evidence of design for use with, or research within, a railway context e.g. has the assessment tool been used successfully within a railway context with supporting research?

The first criterion is particularly important and therefore each tool was assessed against this key factor. In the first instance all were considered acceptable based on the psychometric evidence available.

The selected assessment tools were narrowed down still further to accommodate practical issues

Table 4 lists all the assessment tools to assess all 12 criteria. If support from the rail industry had been forthcoming for this project then the OPC might have been able to trial all of these short-listed assessment tools if they met all three criteria above. This would involve different rail organisations working with the OPC to trial different tools. It would also remove the burden of one organisation having to trial all of them.

Personal Characteristic	Assessment Tool
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.	Track Work Sample Exercise (TWSE)**
2. Analyse, understand and work with verbal information.	Rules Acquisition Aptitude Test (RAAT)* or Understanding instructions (VWP1) **
3. Undertake and complete clerical and administrative tasks.	The Basic Checking Test (CP7.1)* or Clerical Checking Test (CP3.1)*
4. Ability to work with a range of different equipment and tools.	
5. Introduce effective plans and make appropriate decisions.	Bespoke Planning Test
6. Remain vigilant and attentive for safety hazards or incidents.	Group Bourdon **** Safe Concentration And Attention Test (SCAAT)**
7. Communicates effectively with others.	Customer Contact Group Exercise (Unassigned Role)* or Customer Service Team Exercise (CSTE)**
8. Manage and control others with confidence and assertiveness.	Bespoke interview with • the Occupational Personality Questionnaire (OPQ)* or • Customer Service Personality Questionnaire (CSPQ)** or • 16 Personality Factor (16PF)*** • Customer Contact Group Exercise (Unassigned Role)* or • Customer Service Team Exercise (CSTE)**
9. Establish and maintain effective relationships with others and propagate team working.	Bespoke interview with • the Occupational Personality Questionnaire (OPQ)* or • Customer Service Personality Questionnaire (CSPQ)** or • 16 Personality Factor (16PF)*** • Customer Contact Group Exercise (Unassigned Role)* or • Customer Service Team Exercise (CSTE)**
10. Motivated to follow rules and procedures.	Bespoke interview with • the Occupational Personality Questionnaire (OPQ)* or • Safe Personality Questionnaire (SAFEPQ)** or • 16 Personality Factor (16PF) ***
11. Undertakes careful checks at all times.	Bespoke interview with • the Occupational Personality Questionnaire (OPQ)* • Safe Personality Questionnaire (SAFEPQ)** or • the 16 Personality Factor (16PF) ***
12. Manages emergency and unexpected situations.	Bespoke interview with • the Occupational Personality Questionnaire (OPQ)* or • the Safe Personality Questionnaire (SAFEPQ)** or • the 16 Personality Factor (16PF) ***

Table 4: Identifying suitable assessment tools to assess the five safety-critical activities included as part of the pilot.
Test Publishers

* Saville and Holdsworth ** OPC Assessment *** ASE **** Human Group, The Netherlands

However, as is indicated later in the report, the support from the rail industry was disappointing. Only one organisation, AMEC Rail, was able to lend its support. This meant the OPC were only able to trial a subset of the recommended assessment tools.

Given the lack of support from the rail industry and a reliance on one maintenance organisation then criteria 2 and 3 listed above became particularly important. With reference to criterion 2, it was inappropriate to use assessment tools that could be impractical and require a considerable investment of assessor time e.g. group/team exercises to assess *Criterion No 7: Communicates Effectively with Others.*

With regard to criterion 3 it was important to select assessment tools that:

1. were as closely matched to the job requirements; and,
2. had been designed for the railway context.

These criteria would help to select those assessment tools that would have the best chance of predicting future performance. The assessment tools that were chosen to include as part of this pilot programme were:

- the Rules Acquisition Aptitude Test (RAAT);
- the Safe Personality Questionnaire (SAFEPQ);
- the Safe Concentration and Attention Test (SCAAT); and,
- the Track Work Sample Exercise (TWSE).

The justification for the chosen assessment tools

This next section summarises the justification for each of the assessment tools that were chosen. It gives a description of each tool, together with justification against each of the three criteria listed above. Further details of each assessment tool are given in the respective manual for each test or questionnaire. All the validity co-efficients quoted below have not been corrected for direct or indirect range restriction.

Justification for the Rules Acquisition Aptitude Test (RAAT)

Description of the test: The RAAT assesses a candidate's ability to follow and understand rules and procedures that are railway orientated. The candidate then has to answer multiple-choice questions based on the rules and procedures. The RAAT was designed specifically for the railway including training in rules and regulations.

Criterion 1: Psychometric Properties of the RAAT

Face validity: in this test candidates are given fictitious rules and procedures to read which are based around the UK rail rule book. The test has very high face validity with candidates.

Content validity: During its design careful consideration was given to ensure that the content of the RAAT reflected the content and difficulty level of the rules a UK railway employee would have to learn and follow within the work role. This included those working on the track. With regards to the breadth of the test content, it includes passages that cover a range of rules and regulations e.g. starting trains, riding in the driver's compartment, communication, disciplinary procedures etc.

Construct Validity: As part of its development the RAAT trial test was correlated with other verbal based tests similar in content and style and that purported to measure a similar construct including:

- the Working with Words (VWT3) test from Saville and Holdsworth. The correlation between the VWT3 and the RAAT was 0.62 ($p<0.05$); and,
- the VT1 test from Saville and Holdsworth. The correlation was 0.68 ($p<0.05$).

These findings supported the construct validity of the RAAT.

Criterion Related Validity evidence was available to support the test. The RAAT had been used as a recruitment tool for tram drivers within a light rail organisation. Those trainees who gained lower scores on the RAAT at selection were more likely to require more attempts to pass training (correlation = -0.216 n = 60 $p<0.05$). In a second light rail organisation those trainees who gained higher scores on the RAAT test at selection subsequently gained higher scores in rules training (correlation = 0.633 n = 15 $p<0.01$). The RAAT had also been used in Australia to help select revenue protection personnel for a rail organisation. Performance on the RAAT was positively correlated with performance in a police exam (correlation 0.341, n=53 $p<0.01$).

These findings supported the criterion related validity of the RAAT, particularly in relation to predicting success in rules based training. Again these validity co-efficients were not corrected for either direct or indirect range restriction.

Reliability: No test-retest or alternate form reliability data was available. Internal consistency data was available. Cronbachs Alpha for the RAAT was calculated as 0.845 based on a sample of 227 rail industry employees, applicants and students. This indicated an acceptable level of reliability.

Criterion 2: Practicalities of using the RAAT

The RAAT is a paper and pencil test. It can be administered one-to-one or in large groups. The time limit on the test is 22 minutes and total administration time is about 40 minutes. The RAAT did not demonstrate any practical constraints to its use as part of this pilot programme.

Criterion 3: Evidence of design for, use with, or research within the railway context

As indicated earlier the RAAT was specifically designed for the railway environment. It has been used and continues to be used by rail organisations both in the UK and overseas as a recruitment tool for safety-critical personnel who work with rules and procedures. A range of norms are available for different types of rail employee. The psychometric development supporting the RAAT and the criterion related validity evidence was undertaken with rail employees.

Justification for the Safe Personality Questionnaire (SAFEPQ)

Description of the test: The SAFEPQ is a 115 question, self-report normative personality questionnaire that assesses four aspects of personality that are considered to be relevant to safety-critical working. They are:

a) Demonstrate Willingness to Follow Rules and Procedures;
b) Calmness in Emergency Situations;
c) Responsible and Conscientious; and,
d) Cautious and Patient Approach to Work.

Each scale has between 2 and 4 sub scales.

The SAFEPQ had been designed specifically for safety-critical roles. The OPC has, over a number of years, undertaken job analysis for numerous safety-critical jobs within the rail industry. Over time the OPC has found that, despite analysing different work roles, similar personal characteristics emerged as being key to success in many of those work roles. The OPC referred to these as the Generic Safety Profile of a safety-critical employee. To assist in the measurement of some of these generic characteristics, the OPC designed the SAFEPQ. It was designed to be used as a selection tool (in conjunction with a structured interview), and a development tool for safety-critical roles.

Criteria 1: Psychometric Properties of the SAFEPQ

Face validity: The questionnaire had been designed to be used specifically within a work context. The majority of questions in the SAFEPQ are either job related or are 'neutral' because they do not relate to either work or out-of-work situations e.g. *'I occasionally worry whether I've done the right thing following a crisis'.* A handful of questions are related to behaviour at home.

The SAFEPQ does not have very high face validity because not all the questions are work related. This was deliberate in the design because too many work related questions may have meant the questions were too transparent. However the mix of both work related and 'neutral' questions indicates that the SAFEPQ has moderate face validity.

Content validity: The work related questions in the SAFEPQ do relate to the content of safety-critical railway work. However, not all the questions are work related and therefore it is concluded that the SAFEPQ has moderate content validity.

Construct Validity: The SAFEPQ was not correlated with other personality measures to collect construct validity data. Inter-correlations between all the subscales are moderate and significant, with a median inter-correlation of 0.63.

Criterion Related Validity evidence was available to support the SAFEPQ. A UK tram company administered the SAFEPQ at selection for its tram drivers. During training the trainee was assessed on his/her ability to drive the tram. Those trainees who gained higher scores on *'Calmness during emergency situations'* as measured by the SAFEPQ were rated as more confident tram drivers by their trainers (correlation = 0.27 n = 60 $p<0.05$).

The SAFEPQ was administered to existing UK train drivers. At the same time each driver's manager was asked to provide details of the driver's performance on the job, including any safety incidents. Those train drivers who gained higher scores on *'Willingness to follow rules and procedures'* as measured through the SAFEPQ gained higher ratings on their ability to:

1) 'Shunt, couple and uncouple trains' (correlation = 0.347 n = 58 $p<0.01$);
2) 'Operate and control trains' (correlation = 0.330 n = 50 $p<0.01$);
3. 'Monitor and maintain progress' (correlation = 0.221 n = 58 $p<0.01$); and,
4. be safe (correlation = 0.240 n = 54 $p<0.05$).

They were also less likely to have had a Signal Passed At Danger ($t=(49)=2.7$ $p<0.01$) or a station overrun ($t=(49)=1.87$ $p<0.05$).

Those train drivers who gained higher scores on '*Cautious and patient approach to work'* as measured through the SAFEPQ gained higher ratings on their ability to:

1) 'Shunt, couple and uncouple trains' (correlation = 0.39 n = 58 $p<0.01$);
2) 'Operate and control trains' (correlation = 0.462 n = 58 $p<0.01$);
3. 'Monitor and maintain progress' (correlation = 0.402 n = 58 $p<0.01$); and,
4. be safe (correlation = 0.386 n = 54 $p<0.01$).

They were also less likely to have had a Signal Passed At Danger ($t=(49)$ 2.661 $p<0.01$), or a station overrun ($t=(49)$ 2.661 $p<0.01$).

Those train drivers who gained lower scores on *'Responsible and conscientious approach'* as measured through the SAFEPQ were more likely to have records of speeding ($t=(49)=2.75$ $p<0.05$).

These studies provided criterion related validity evidence for all four main scales on the SAFEPQ, but the *'Willingness to follow rules and procedures'* and '*Cautious and patient approach to work'* scales in particular.

Reliability: No test-retest or alternate form reliability data was available for the SAFEPQ. Internal consistency data was available. Cronbachs alpha for the SAFEPQ main scales ranged from 0.82 to 0.928. For the sub scales these ranged from 0.655 to 0.850 with a median of 0.744. These values indicated acceptable internal reliabilities.

Criteria 2: Practicalities of using the SAFEPQ

The SAFEPQ is a paper and pencil questionnaire. It can be administered in one-to-one or large groups. The questionnaire takes about 25 minutes to administer. The SAFEPQ did not demonstrate any practical constraints to its use as part of this pilot programme.

Criteria 3: Evidence of design for, use with, or research within the railway context

As indicated earlier the SAFEPQ was designed to be used within a safety context and the rail industry in particular. It is to be used with a structured interview to assist in recruiting safety-critical personnel, including but not limited to tram and train drivers. It is used both in the UK and overseas by railway organisations. Norms are available for different rail employees. The psychometric development supporting the SAFEPQ and the criterion related validity evidence was undertaken with rail employees.

Justification for the Safe Concentration and Attention Test (SCAAT)

Description of the test: The SCAAT assesses concentration and attention. It is essentially a cancellation task. The candidate has to search for and cross out target shapes on a page of shapes, disregarding all distracter shapes. The test is scored on the number of correct target shapes crossed out (correct score) and the number of target shapes missed out (omissions score). The test has three sections:

- Section 1 involves the candidate searching for one target shape.
- Section 2 the candidate searches for two target shapes at any one time.
- Section 3 the candidate searches for two target shapes at any one time, but one shape constantly changes.

The test was designed for use with recruiting and selecting safety-critical personnel. Again the OPC's job analysis of safety-critical roles over a number of years had identified that many key safety roles required employees to remain vigilant and to monitor situations for safety hazards or events. The SCAAT was designed to assess this key characteristic.

Criteria 1: Psychometric Properties of the SCAAT

Face validity: By its nature the SCAAT uses shapes and not railway related symbols. The SCAAT does not have face validity with candidates. During administration the assessors have to put particular emphasis upon justifying the use of the test within an employment context.

Content validity: The content of the SCAAT does not directly reflect the content of the vigilance exercises a rail employee might be involved in. At work the employee will not have to search for target shapes and cross them out. Therefore it could be concluded that the SCAAT has low content validity. However, at a cognitive level the SCAAT and the vigilance required in the work role are similar. Both require attention to, and focus on, one or more key tasks whilst at the same time disregarding distracters or distractions.

Construct Validity: The SCAAT has been correlated with other tests of concentration and attention to help provide evidence of its construct validity. The SCAAT has been correlated with the computerised Group Bourdon test. This is a test similar in format and style to the SCAAT. However in this exercise candidates have to cross out groups of four dots, ignoring groups of three and five dots.

In line with predictions the time taken to complete the Group Bourdon was negatively correlated with the correct scores from the three sections of the SCAAT (Section 1: Correlation -0.315, n=77 p <0.01; Section 2: Correlation -0.361, n=77 p <0.01; Section 3: Correlation -0.314, n=77 p <0.01).

In addition the number of omissions on the Group Bourdon was positively correlated with the omissions scores from the three sections of the SCAAT (Section 1: Correlation 0.250, n=77 p <0.05; Section 2: Correlation 0.483, n=77 p <0.05; Section 3: Correlation 0.203, n=77 p <0.05). These findings add weight to the construct validity of the SCAAT. The SCAAT manual also provides evidence of the correlation of the SCAAT with the paper and pencil Group Bourdon and the DTG test - a complex choice reaction time task that involves responding quickly to visual and auditory signals.

Other validation was available with the Cognitive Failures Questionnaire (CFQ). Train Drivers who had been involved in safety incidents sat the SCAAT and also completed the CFQ, designed to assess everyday slips and lapses in concentration. The correct scores from the three sections of the SCAAT were all found to correlate significantly with the CFQ (Section 1: correlation 0.249, n=61 < 0.05; Section 2: correlation 0.296, n=61 p <0.05; Section 3: correlation 0.298, n=61 p <0.01). The omissions scores did not correlate with the CFQ. These findings support the construct validity of the SCAAT, and in particular the correct score.

Criterion Related Validity evidence was available to support the SCAAT.

A UK tram company administered the SCAAT test at selection for tram drivers. During training each trainee was assessed on his/her ability to drive the tram.

Those trainees who gained higher correct scores on Part 1 of the SCAAT obtained higher ratings from their trainers on their practical handling performance (correlation = 0.210 n = 61 p= 0.05). They were also rated as more confident drivers (correlation = 0.324 n = 59 p<0.01).

Those trainees who had more omissions on Section 2 of the SCAAT test were rated as less confident in their ability to drive as assessed by their trainers (correlation = 0.264 n = 59 p<0.05). Those trainees who had more omissions on Section 3 of the SCAAT obtained lower ratings from their trainers on their practical handling performance (correlation = 0.230 n = 61 p< 0.05), and were rated as being less confident in their abilities to drive by their trainers (correlation = 0.340 n = 59 p<0.01).

In a second study UK rail businesses administered the SCAAT test to a group of existing train drivers. At the same time measures were taken of their job performance using ratings from their managers.

Those train drivers who had higher correct scores on Section 3 of the SCAAT gained higher ratings on ‘Preparation for Duty’ (correlation = 0.340 n = 38 p<0.05).

Those train drivers who had higher omissions on section 1 of the SCAAT gained higher ratings on 'In-cab warnings are acknowledged as appropriate' (correlation = -0.290 n = 39 $p<0.05$). These results together provide some support for the criterion related validity of the SCAAT.

Reliability: No test-retest or alternate form reliability data was available. Internal reliability measures were available comparing the sub tests within each section. For the correct scores these ranged from 0.713 to 0.872 with a median of 0.758. For the omissions scores these ranged from 0.583 to 0.837 with a median of 0.733. Overall these findings indicate acceptable reliability measures, though the value of 0.583 for one of the omissions scores is somewhat low.

Criteria 2: Practicalities of using the SCAAT

The SCAAT is a paper and pencil test. It can be administered one-to-one or in large groups. The time limit on the test is 21 minutes with a total administration time of about 45 minutes. The SCAAT did not demonstrate any practical constraints to its use as part of this pilot programme.

Criteria 3: Evidence of design for, use with, or research within the railway context

The SCAAT was designed for use within the safety context and the rail industry in particular. The SCAAT has been developed and validated on rail employees. It is used extensively for the recruitment of safety-critical personnel including train drivers, guards, depot drivers, tram drivers and station staff. Norms are available for a range of safety-critical personnel at different ability levels. It is used by rail organisations in the UK, Ireland, South Africa, Australia and New Zealand.

Justification for the Track Work Sample Exercise (TWSE)

Description of the test: The Track Work Sample Exercise (TWSE) is a test that was designed specifically for employees working on the track. It is a fictitious exercise that is based around a monorail organisation and the test has three parts. A description of each part is given below.

Part 1 - this is a simple fault finding exercise where the individual has to find faults in the monorail track and signals and to determine the priority of the fault.

Part 2 – this is a more complex section of the test and it involves the employee using information presented on maps with grid references and tabular information similar to part 1.

Part 3 – this is based on part 2 of the test and it involves the employee using similar information to that in part 2 to determine how long a fault will take to fix.

Criteria 1: Psychometric Properties of the TWSE

Face validity: During the development of the TWSE, time was invested to ensure that the TWSE included information that a track employee might encounter in his/her day to day work. This helped to establish the credibility and face validity of the test amongst track trainees or new recruits who may be asked to complete the test.

Content validity: An OPC psychologist worked with a track job expert to help determine the content of the TWSE. This job expert had an in-depth understanding of the safety-critical activities required in a track worker including the '*ability to identify faults, work with numerical information, analyse procedures, use diagrams and reason with information'.* These job tasks were then mimicked within the TWSE. The OPC also ensured that the difficulty level of the TWSE tasks undertaken by the assessee in the exercise was equivalent to that required within the work activities. All of this work helped to establish the content validity of the TWSE.

Construct Validity: Construct validity evidence involving correlating the TWSE with a very similar test was not available.

The TWSE was correlated with the RAAT test. As discussed above, the RAAT involves the candidate being presented with passages of rule-based information similar to that found in the UK rail industry. Therefore the test assesses verbal ability with rail related information. The TWSE does involve the candidate working with written information and it was therefore predicted that the TWSE should have modest but significant correlations with the RAAT. The TWSE is measuring a broad ability that does contain some aspect of verbal reasoning, but overall measures an ability that encompasses working with diagrams, making decisions, checking and reasoning. The correlations for the TWSE and the RAAT are as follows:

- TWSE Part 1 and the RAAT the correlation was 0.567 ($n=139$ and $p<0.01$);

- TWSE Part 2 and the RAAT the correlation was 0.653 (n=139 and p<0.01); and,
- TWSE Part 3 and the RAAT the correlation was 0.572 (n=139 and p<0.01).

These results provide some, but limited, support for the construct validity of the TWSE.

Criterion Related Validity evidence was not available for this test.

Reliability: No test-retest or alternate form reliability data was available. Internal consistency measures were available using Cronbachs alpha. The values were as follows:

- TWSE Part 1: 0.921 N= 135;
- TWSE Part 2: 0.946 N= 135; and,
- TWSE Part 3: 0.921 N=134.

These values indicated acceptable internal reliability measures for the TWSE.

Criteria 2: Practicalities of using the TWSE

The TWSE is a paper and pencil test. It can be administered one-to-one or in large groups. The time limit on the test is 40 minutes and total administration time is about 90 minutes. The instructions are long and detailed for the test and therefore administration does take some time. This was considered to be a possible hindrance to the use of the test as part of the pilot programme.

Criteria 3: Evidence of design for, use with, or research within the railway context

The TWSE was developed specifically for the railway context, and track working in particular. However it was a new test and had no history regarding usage either within the UK or overseas. The psychometric development of the TWSE was undertaken with rail employees.

Stage 4: Trial the Assessment Tools to Examine Their Effectiveness

Once the assessment tools that were to be trialled had been selected then the next stage was to determine the effectiveness of those tools. This would involve trialing the tools with maintenance organisations within the UK that recruit and employ track employees. This would help to determine if, at recruitment, the assessment tools could identify those applicants who are more likely to be safe and effective either in training and/or on the job. This is a key stage in the trialing process and it is referred to as validation.

The validation process

Validation is a statistical process and it involves identifying the links between an individual's assessment tool performance and his/her training and/or job performance. The aim is to determine, for example, if those applicants gaining higher scores on the assessment tools subsequently gain higher performance in training and/or on the job.

There are two types of validation – predictive and concurrent

There are two different types of validation that can be undertaken with this type of statistical process. Each validation model is outlined below.

Predictive validation – this involves getting applicants to sit the assessment tools at selection. Some of these applicants would then be recruited and at a later date training and job performance measures would be collected for these same individuals. Statistical analysis would then be undertaken. This would determine if those applicants who gained higher ratings or scores on the assessment tools at selection subsequently gain higher ratings in training and on the job, and vice versa.

This is the best type of validation process since it identifies if the assessment tools predict an applicant's subsequent performance in training and/or on the job. The disadvantage is that it can take some time to complete. This is because the researcher has to wait a period of time until the employees have completed training, or have undertaken the job for a sufficient period to achieve competence. In addition the researcher can, over time, find him/herself dealing with an increasingly smaller data set as employees who sat the assessment tools leave the organisation before the validation is complete. Furthermore, if the assessment tools are used to make selection decisions then the predictive validation can be undermined by restriction of range. This is where it is only those achieving the 'pass mark' on the tests that are recruited and are available for the validation, limiting the statistical analysis that is undertaken. All of these factors can limit the practicality and effectiveness of undertaking this type of validation.

Concurrent validation – this involves getting existing employees to sit the assessment tools, and at the same time, ie, concurrently, collecting training and job performance data. This type of validation is undertaken with existing employees and not applicants. This type of validation has some disadvantages. First, it is undertaken on existing employees and not applicants. Therefore the

researcher has to be careful extrapolating from an employee to an applicant population. Sometimes positive results from a concurrent validation study may not subsequently be supported from a follow up predictive validation study. Second, the researcher is not predicting future training and job performance as in the case of a predictive validation study, so again we need to be cautious in interpretation. However it is a useful validation process given that it does allow the researcher to collect data relatively quickly, because there is no need for a time interval as with the predictive validation.

The validation model used as part of this pilot project

This current project provided the OPC with a number of challenges that are discussed later. These meant that the OPC had to rely in general on a concurrent validation model using training and job performance data. However the validation using training data did have a small predictive validation component as will be seen later in the report.

The training validation

As part of this project the OPC were able to trial the assessment tools and determine their effectiveness in relation to success in training. The OPC sought support from the UK railway maintenance companies to assist in trialing the assessment tools. This would involve these organisations trialing the recommended assessment tools at recruitment and or with existing employees, then providing the OPC with training data on those successful applicants. The OPC could then analyse the data to determine if there were links between success on the assessment tools and success in training.

The rationale for undertaking a validation study using training data

The training undertaken in the rail industry for track workers is very closely related to the job competencies and requirements on the track. Many of these training courses will be safety- critical, compulsory and a pre-requisite for undertaking the work. They will also have standard pass marks. Failure to achieve these will result in the trainee not being able to undertake the work. Many of the training courses that would be used in the validation would also involve existing employees undertaking re-certification and re-training prior to re-commencing their work duties.

Therefore there is a strong link between the training and job requirements, and a reasonable rationale for using training data as part of the validation. It was therefore predicted that the chosen assessment tools should demonstrate some link to training, as well as job performance. However the validation using job performance that is reported later in this report would provide the strongest evidence for the assessment tools.

Support from the rail industry

The support from across the industry was disappointing. Only one organisation, Amec Rail was able to provide support for this part of the project. As indicated earlier this meant the OPC were only able to trial a subset of the recommended assessment tools. If the support from the industry had been greater then the OPC could have incorporated many of the other assessment tools listed in Table 4. This would have given a comprehensive understanding of the effectiveness of a whole range of different assessment tools.

Component 1 of the trainee sample

At selection the assessment tools (the RAAT, SCAAT, SAFEPQ and the TWSE) were administered by AMEC Rail to applicants applying for track worker roles within the organisation. Those who were successful passed through into training where measures of their training performance were collected. This group of trainees made up 15% of the validation study, ie, 15% of the training validation was predictive in nature.

Component 2 of the trainee sample

Existing track employees were invited to complete an assessment tool: the RAAT; SCAAT; SAFEPQ; or the TWSE, as part of an organisation-wide briefing programme. Each of these employees were also undergoing training or re-training for a specific work skill. The re-training was for those work skills that had a set shelf-life that then required re-training and in some cases re-certification. This could include training in the key safety-critical activities used as part of the project.

Again at the end of the course measures were taken of the trainee's performance. This group of trainees made up 85% of the training validation sample, ie, 85% of the training validation was a concurrent validation study, in nature. This is because the test and the training data are collected, essentially, concurrently.

Designing a generic training evaluation form

The training that was used as part of the validation was variable in nature depending upon the trainee's or employee's work role, so it could be personal track safety, fire, man handling course, etc. So the content of the training was variable as was the different competence requirements and pass marks for the different training courses. Therefore the OPC designed a generic training evaluation form that could be used to evaluate trainees and employees across all the courses. This would allow all the training data to be collapsed for one analysis and would increase the sample size. Otherwise the OPC would have had small data sets from different courses with different measures, making the analysis both difficult and limited.

The form that was designed collected the trainers' subjective, but expert views, about a trainees' performance during training. The trainer was asked to rate the trainee on:

- overall training performance;
- ability to learn new information;
- his/her positive contribution to training; and,
- motivation and desire to learn.

See Appendix 2 for a copy of the form. About 20 trainers were given a short training session (1 hour in length) with an OPC psychologist in how to complete the form, make reliable and valid ratings and return the form back to the OPC. Following this session trainers then completed one form per trainee at the end of the training.

Once the forms were completed the OPC collapsed these four measures to give one overall rating of training success that incorporated ability, positive contribution and motivation to learn. If the data samples had been bigger then the OPC could have looked at each of the four measures separately.

This generic measure of training is not ideal, because it does not relate directly to the performance during training and it is the trainer's subjective rating. Therefore the results from the training validation should be interpreted with some caution. However what it will do is provide some insight into the effectiveness of the assessment process in predicting training.

How the data was analysed

Setting up hypotheses

Following the collection of the test and training data the OPC psychologists then input the data into a specialist statistics package. The OPC set up hypotheses to determine if and how each assessment tool should be correlated with training performance. The data was then correlated to determine the correlational link between, on the one hand, test performance, and on the other hand, training performance. The results were tested for statistical significance to determine the chance probability of the results and how much faith could be attributed to the findings.

Range restriction

There was likely to be range restriction in the data that had been collected. This is because it only included those applicants who passed the tests and those employees who were considered safe and competent to work, others would have been screened out either in training or on the job. There are statistical techniques that will correct for this and provide potentially more encouraging findings. However given the small sizes involved and the OPC's desire to provide confident albeit conservative conclusions, this was not done.

The validation results

The validation results are presented for each assessment tool separately. Overall the sample sizes were relatively small, the results should be treated with some caution and may not be generalisable to a larger sample. However, they do provide an insight into the validation of these assessment tools with training performance.

The Track Work Sample test (Parts 1, 2 and 3)

The TWSE has already been described earlier in this document. The OPC predicted that the TWSE, because of its assessment of ability and aptitude would be correlated with training performance.

The correlations between the TWSE and training performance are displayed in Table 5. If a significant link (correlation) was found between the test and training performance then this is indicated with a tick. If a link was predicted but not found then this is indicated with a cross.

	TWSE		
	Part 1	**Part 2**	**Part 3**
Composite Training Measure	X Correlation = 0.261 n= 33 Significance p = n.s*	✓ Correlation = 0.430 n= 33 Significance p < 0.01	✓ Correlation = 0.368 n= 31 Significance p < 0.05

* Non-Significant

Table 5: Correlations between the Track Work Sample Exercise (TWSE) and training performance.

The results in Table 5 demonstrate significant correlations between the TWSE Parts 2 & 3 and training performance. Those individuals gaining higher scores on the TWSE Part 2 and 3 gained higher training ratings, and vice versa. These results are encouraging. They demonstrate the links between the TWSE and training performance. However given the small sample size and the measure of training used these results should be interpreted with some caution. The correlations themselves are of acceptable value. Interestingly Part 1 of the TWSE failed to predict performance. Part 1 is the simplest of the three parts and it may be that the test is not distinguishing between effective and less effective trainees. In contrast, it is Parts 2 and 3 of the test that involve the individual completing complex tasks, combining different information together, ie, the more intellectually demanding aspects of the test that are successfully predicting training performance.

The Safe Concentration And Attention Test (SCAAT)

The OPC predicted that the SCAAT Correct and Omissions Score would be correlated with training performance. Training performance is likely to be a function of the ability to concentrate and maintain focus. Therefore the SCAAT should be correlated with training performance.

The correlations between the SCAAT and training performance are displayed in Tables 6 and 7.

	SCAAT Test		
	Sub Test 1 Correct Score	**Sub Test 2 Correct Score**	**Sub Test 3 Correct Score**
Composite Training Measure	✓ Correlation = 0. 423 n= 23 Significance p < 0.05	✓ Correlation = 0.568 n= 23 Significance p < 0.01	✓ Correlation = 0.367 n= 23 Significance p < 0.05

* Non-Significant

Table 6: Correlations between the SCAAT Correct Score and training performance.

	SCAAT		
	Sub Test 1 Omissions Score	**Sub Test 2 Omissions Score**	**Sub Test 3 Omissions Score**
Composite Training Measure	X Correlation = 0.141 n= 23 Significance p = n.s*	X Correlation = 0 n= 23 Significance p = n.s*	X Correlation = 0 n= 23 Significance p = n.s*

* Non-Significant

Table 7: Correlations between the SCAAT Omissions Score and training performance.

The results in Tables 6 and 7 demonstrate significant correlations between the SCAAT Correct Score and training performance, but not between the SCAAT Omissions Score and training performance. Those individuals who were gaining higher Correct Scores on the SCAAT were also gaining higher training ratings. These results indicate that those individuals who were finding it easier to concentrate and work quickly through the SCAAT were also gaining higher training ratings. Successful training performance is likely to be a function of the trainee's ability to concentrate that will help effective learning. Hence the correlation of training performance with the SCAAT concentration test. But again given the small sample size the conclusions are tentative and preliminary. Interestingly the number of concentration errors was not correlated with training performance. The OPC has found with its other work that the SCAAT omissions score is not as an effective criterion predictor as the correct score, and these current results are in line with those findings.

The Safe Personality Questionnaire (SAFEPQ)

The SAFEPQ assesses four aspects of personality that are considered to be linked to safety critical working. It was therefore predicted that all four scales of the SAFEPQ (*Demonstrate a willingness to follow rules, calm in emergencies, responsible and conscientious, and cautious and patient approach*) would be correlated to some degree with training performance.

The correlations between the SAFEPQ and training performance are displayed in Table 8.

	Safe Personality Questionnaire (SAFEPQ)			
	A: Demonstrate a willingness to Follow Rules and Procedures	B: Calm in Emergency Situations	C: Responsible and Conscientious	D: Cautious and Patient Approach to Work
Composite Training Measure	X Correlation = -0.175 n= 16 Significance p = n.s*	✓ Correlation = 0.465 n= 16 Significance p < 0.05	X Correlation = -0.144 n= 16 Significance p = n.s*	X Correlation = 0.146 n= 16 Significance p = n.s*

* Non-Significant

Table 8: Correlations between the Safe Personality Questionnaire (SAFEPQ) and training performance.

The results in Table 8 demonstrate a significant correlation between '*calm in emergency situations'* and training performance. However significant results were not identified for the other three personality scales. The data samples available here were very small and this may explain why more significant results were not identified. Furthermore, the one significant result for the scale '*Calm in emergency situations*' cannot be relied upon with great confidence. However the results for this scale suggest that individuals who see themselves as more calm, relaxed and emotionally controlled, as measured through the SAFEPQ, are more likely to gain higher trainer ratings in training. These findings would appear plausible. Training success is likely to be a function of a trainee's ability to remain unemotional, worry free and confident. However the OPC would recommend that given the small sample size further research is undertaken to explore these findings and the effectiveness of the three other personality scales in more detail.

The Rules Acquisition Aptitude Test (RAAT)

The RAAT was designed specifically for the railway including training in rules and regulations. In this present study many of the training programmes that trainees would undertake would include rules learning. Therefore it was predicted that performance on the RAAT would be positively correlated with training performance.

The correlation between the RAAT and training performance is displayed in Table 9.

	RAAT
Composite Training Measure	X Correlation = 0 n= 51 Significance p = n.s*.

* Non-Significant

Table 9: Correlations between the RAAT and training performance.

The result in Table 9 demonstrates that the RAAT did not correlate with training performance. Those individuals who gained higher scores on this test of verbal understanding were not gaining higher scores in training. These results were surprising given that the RAAT has been designed to assess the type of rules an employee might experience within the UK rail industry and in the type of training conducted by Amec Rail. Furthermore, the OPC has undertaken other validation studies correlating the RAAT with rail industry training, and found very encouraging results. The sample size was similar to that for other analyses reported so far. Some other analyses, eg, for the SCAAT and TWSE were less. Therefore small sample size could not be identified as a key factor here. The results from this current study would suggest that aptitude for learning rules is not related to training performance. The OPC recommend that a much larger study is undertaken to explore this in more detail and to help provide a more confident conclusion regarding the links between the RAAT and track training.

Overview of Training Validation

Overall the training validation has provided some interesting results for the assessment tools and in particular the TWSE (Parts 2 and 3), the SCAAT and the '*Calm in Emergency Situations*' scale from the SAFEPQ. However the sample sizes are small and the training performance measure is a subjective rating made by the trainer. Therefore the results need to be interpreted with some caution. These preliminary findings suggest that psychological assessment tools, based on a thorough analysis of the requirements of track work, can be related to performance in track related training. However further work will be required to check out these findings with a larger sample and more robust measures of training.

The Job Performance Validation

As part of this project the OPC were looking to trial the assessment tools and determine whether or not individuals who gain higher scores on the tests also have higher job performance ratings. This would be the best support for the effectiveness of the assessment tools.

Reliance on a concurrent validity model

As part of this work the OPC were looking to use a predictive validation study, given this is the strongest form of validation. However the OPC was unable to gain industry support for the project, particularly in the early stages. This would have allowed the assessment tools to be administered at selection, a time lapse to take place and to then job performance to be assessed. Therefore, because of these time constraints the OPC had to rely upon a concurrent validation. This is not ideal but it would provide some insight into the effectiveness of the assessment tools in relation to job performance. Again as with the training validation the OPC sought support from the UK railway maintenance companies to assist in trialing the assessment tools.

This would involve organisations trialing the recommended assessment tools with existing employees, then providing the OPC with job performance data on those same employees. The OPC could then analyse the data to determine if there were links between success on the assessment tools and success on the job.

Support from the industry was limited

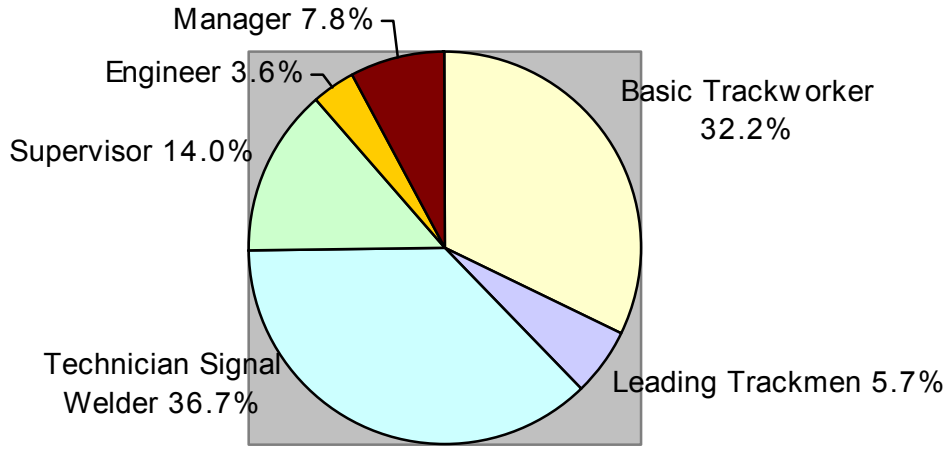
The support from across the industry was again disappointing. Only one organisation, Amec Rail was able to provide help for this final and critical part of the project. This stage would help to determine if the assessment tools would be related to success on the job. The limited support from the industry meant again the OPC were only able to trial a subset of the recommended assessment tools in Table 4. Furthermore those assessment tools that were trialed were those that were considered to be most suitable. If the support had been greater then the OPC could have used a much more comprehensive range of assessment tools.

Background information about the track workers involved in the study

Existing track employees were invited to complete an assessment tool (either RAAT, SCAAT, SAFEPQ or the TWSE) as part of an organisation-wide briefing programme. Each of these employees had also undergone training or re-training for a specific work skill that could include the four safety-critical roles included within the pilot. The re-training was for those work skills that had a set shelf life that then required re-training and in some cases re-certification.

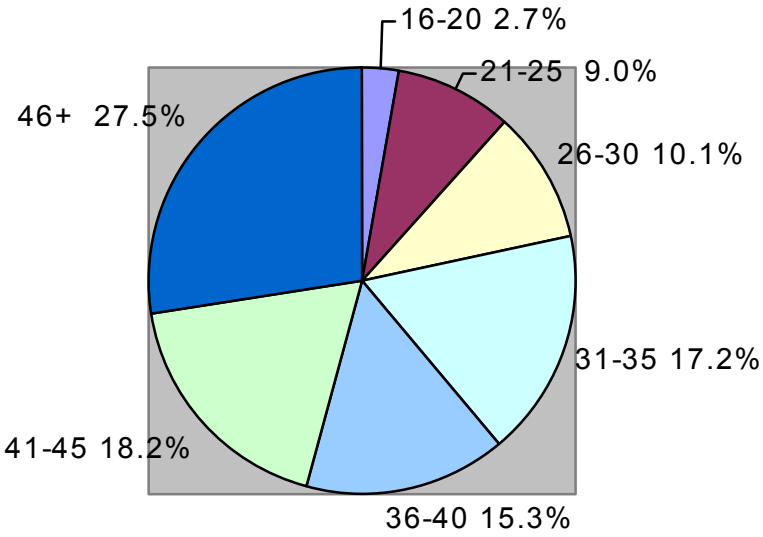
These employees that took part in the study were drawn from a range of work roles. The percentage of employees in each work role are given below.

Work Roles

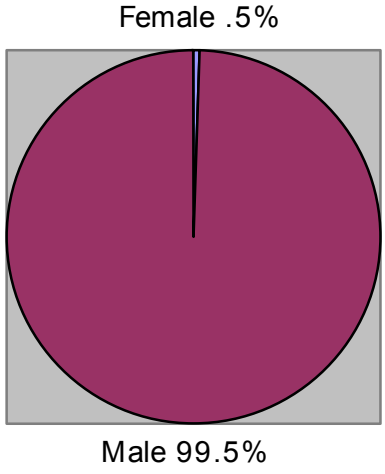


The ages of those taking part and their gender are given below.

Age Band



Gender



It will be seen that this sample is varied both in terms of job function and age. Some of these employees would be involved in undertaking, on a regular basis, the four safety-critical activities used as part of this pilot programme. So therefore this track worker sample was appropriate and acceptable for the pilot.

Assessing job performance

The job performance measure

Once the employees had sat the assessment tool his/her manager/supervisor was invited to complete a special one-off appraisal form that assessed the key characteristics required for success and safe performance on the job. This form was based around the key characteristics that were identified as part of the job analysis and the characteristics listed in Table 1. Fifteen measures of job performance were collected, ranging from motivation to follow rules to a rating of safety performance. The form was designed in a tick box, likert format, and a copy of the appraisal form is given in the appendix.

Training for managers/supervisors in how to complete the form

The managers/supervisors were briefed by an OPC psychologist on how to complete the form. The briefing took about 1 hour. This was either done in groups via regional workshops, one-to- one's or via telephone meetings. The managers/supervisors were briefed on how to complete the form, provide reliable and valid measures, and minimise bias.

The managers/supervisors completing the form were told that it would not record his/her name, the results would remain confidential and would not be disclosed to the organisation. This would help to increase the candidness of the responses and help to improve validity. This study involved collecting assessment and job performance data on each existing employee concurrently. This was therefore a concurrent validation study.

How the data was analysed

Setting up hypotheses

Following the collection of the test and job performance data the OPC psychologists then input the data into a specialist statistics package. The OPC psychologists then set up hypotheses, predicting what assessment tool should correlate with what job performance measures. Correlating the data then tested these hypotheses. This was undertaken to determine the correlational link between, on the one hand, test performance, and on the other hand, job performance. The results were tested for statistical significance to determine the chance probability of the results and how much faith could be attributed to the findings.

Range restriction

As with the training validation study there was likely to be range restriction in the data that had been collected. This present study would only include those employees who were considered safe and competent to work. Again the OPC could have used the statistical techniques to correct for this and provide potentially more encouraging findings. However given the moderate sample sizes and the OPC's desire to provide confident albeit conservative conclusions, this was not done.

The validation results

The validation results are presented for each assessment tool separately. If a significant link (correlation) was found between the test and job performance then this is indicated with a tick in the respective table. If a link was predicted but not found then this is indicated with a cross. Overall the sample sizes were of reasonable magnitude. However, as with the training validation the results and any significant results do need to be interpreted with some caution.

The Track Work Sample Exercise (Parts 1, 2 and 3)

Given the work sample nature of this exercise it was predicted that the test should be correlated with a whole range of job performance measures, particularly the more ability based aspects of job performance.

The correlations between the TWSE and job performance are displayed in Table 10.

Personal Characteristics	TWSE Part 1	TWSE Part 2	TWSE Part 3
Ability and skills			
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.	X Correlation = 0.152 n= 67 Significance p = n.s*.	✓ Correlation = 0.244 n= 66 Significance p <0.05	X Correlation = 0.177 n= 64 Significance p = n.s*.
2. Analyse, understand and work with verbal information.	X Correlation = 0.152 n= 67 Significance p = n.s*.	✓ Correlation = 0.288 n= 69 Significance p <0.01	✓ Correlation = 0.218 n= 66 Significance p<0.05
3. Undertake and complete clerical and administrative tasks.	✓ Correlation = 0.206 n= 66 Significance p <0.01	✓ Correlation = 0.345 n= 66 Significance p <0.01	X Correlation = 0.174 n= 63 Significance p = n.s*.
4. Ability to work with a range of different equipment and tools.			
5. Introduce effective plans and make appropriate decisions.		✓ Correlation = 0.270 n= 67 Significance p <0.05	X Correlation = 0.175 n= 64 Significance p = n.s*.
6. Remain vigilant and attentive for safety hazards or incidents.			
Working with others			
7. Communicates effectively with others.			
8. Manage and control others with confidence and assertiveness.			
9. Establish and maintain effective relationships with others and propagate team working.			
Motivations			
10. Motivated to follow rules and procedures.			
11. Undertakes careful checks at all times.			
12. Punctuality.			
Emotions			
13. Manages emergency and unexpected situations.			
Other key performance indicators			
14. Sickness record.			
15. Safety record.			
16. Overall job performance.	X Correlation = 0 n= 60 Significance p = n.s*.	✓ Correlation = 0.217 n= 60 Significance p <0.05	X Correlation = 0.175 n= 64 Significance p = n.s*.

* n.s = non significant

Table 10: Correlations between the TWSE and job performance

The results in Table 10 indicate that performance on the TWSE Part 2 is related to overall job performance, and particular job performance measures that are more ability based, eg, ability to

identify faults (1), working with verbal information (2), undertaking clerical tasks (3) and undertaking planning (5). Employees gaining higher scores on these job performance measures gained higher scores on the TWSE Part 2. The correlations were modest but significant. The findings provide some encouragement given that the test was designed to assess and mimic these key characteristics on the job.

Part 1 of the TWSE only correlated with undertaking clerical tasks (3). Employees who gained higher scores on this part of the test gained higher ratings on undertaking clerical tasks, and vice versa. As discussed earlier in this document Part 1 of the test is the simplest and it may not, overall, be discriminating between effective and less effective performers on the job.

Performance on Part 3 of the TWSE was modestly correlated with working with verbal information (2). Employees doing better in Part 3 gained higher ratings on working with verbal information. As discussed earlier Part 2 of the TWSE was already found to correlate with this same criterion. There is a high correlation between Part 2 and Part 3 of the TWSE (correlation 0.737). This would suggest that Part 3 of this test may not be adding any value above and beyond what is predicted by the TWSE Part 2.

Overall these results provide some support for Part 2 of this bespoke work sample test. They indicate that there is a modest link between job performance and assessment tool performance.

The Safe Concentration And Attention Test (SCAAT)

The OPC predicted that the SCAAT should be correlated with those aspects of job performance that require concentration and attention. This included the criterion 'remain vigilant and attentive' but also those that involve an element of checking and attention to detail.

The correlations between the SCAAT and job performance are displayed in Tables 11 and 12. Table 11 gives the correlations for the correct scores and Table 12 gives the correlations for the omissions scores.

Personal Characteristics	Sub Test 1 Correct Score	Sub Test 2 Correct Score	Sub Test 3 Correct Score
Ability and skills			
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.			
2. Analyse, understand and work with verbal information.			
3. Undertake and complete administrative tasks.	✓ Correlation = 0.299 n= 52 Significance p <0.05	X Correlation = 0.163 n= 52 Significance p = n.s*	X Correlation = 0.163 n= 52 Significance p = n.s*
4. Ability to work with a range of different equipment and tools.			
5. Introduce effective plans and make appropriate decisions.			
6. Remain vigilant and attentive for safety hazards or incidents.	X Correlation = 0.118 n= 56 Significance p = n.s*	X Correlation = 0.058 n= 56 Significance p = n.s*	X Correlation = 0.148 n= 56 Significance p = n.s*
Working with others			
7. Communicates effectively with others.			
8. Manage and control others with confidence and assertiveness.			
9. Establish and maintain effective relationships with others and propagate team working.			
Motivations			
10. Motivated to follow rules and procedures.			
11. Undertakes careful checks at all times.	X Correlation = 0 n= 57 Significance p = n.s*	✓ Correlation = -0.289*** n= 57 Significance p <0.05	X Correlation = -0.152 n= 57 Significance p =n.s*
12. Punctuality.			
Emotions			
13. Manages emergency and unexpected situations.			
Other key performance indicators			
14. Sickness record.			
15. Safety record.	✓ Correlation = 0.308 n= 35** Significance p <0.05	X Correlation = 0 n= 57 Significance p = n.s*	✓ Correlation = 0.263 n= 35** Significance p = 0.063
16. Overall job performance.			

* n.s = non significant

** Results for technical, signalling and telecommunications personnel.

*** Significant but counter the prediction.

Table 11: Correlations between the SCAAT Correct Scores and job performance.

Personal Characteristics	Sub Test 1 Omission Score	Sub Test 2 Omission Score	Sub Test 3 Omission Score
Ability and skills			
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.			
2. Analyse, understand and work with verbal information.			
3. Undertake and complete administrative tasks.	X Correlation = 0 n= 52 Significance p = n.s*	X Correlation = 0 n= 52 Significance p = n.s*	X Correlation = 0 n= 52 Significance p = n.s*
4. Ability to work with a range of different equipment and tools.			
5. Introduce effective plans and make appropriate decisions.			
6. Remain vigilant and attentive for safety hazards or incidents.	X Correlation = -0.141 n= 56 Significance p = n.s*	X Correlation = -0.163 n= 56 Significance p = n.s*	X Correlation = 0 n= 56 Significance p = n.s*
Working with others			
7. Communicates effectively with others.			
8. Manage and control others with confidence and assertiveness.			
9. Establish and maintain effective relationships with others and propagate team working.			
Motivations			
10. Motivated to follow rules and procedures.			
11. Undertakes careful checks at all times.	✓ Correlation = -0.246 n= 61 Significance p <0.05	✓ Correlation = -0.370 n= 61 Significance p <0.01	X Correlation = 0 n= 57 Significance p = n.s*
12. Punctuality.			
Emotions			
13. Manages emergency and unexpected situations.			
Other key performance indicators			
14. Sickness record			
15. Safety Record	X Correlation = 0 N=57 Significance p = n.s*	X Correlation = 0.148 n= 57 Significance p = n.s*	X Correlation =0 n= 57 Significance p = n.s*
16. Overall job performance			

* n.s = non significant

Table 12: Correlations between the SCAAT Omissions Scores and job performance.

The results in Table 11 and 12 indicate that performance on the SCAAT was not related to performance on the job ie measure *6: Remaining vigilant and attentive*. This was the key job criterion for the SCAAT.

The failure to find any link between the SCAAT and this job performance measure could be attributed to the difficulty raters would have assessing an employee's standing on this criterion per se. The rater is only likely to know about the employees' lack of concentration through outcomes, ie, safety incidents or events for example. Interestingly Sub Test 1 and 3 Correct Scores were significantly, albeit modestly, correlated with safety performance. This would support the argument put forward. Employees who were gaining higher Correct Scores on Sub Test 1 and 3 of the SCAAT were more likely to be rated as having a better safety record by their manager or supervisor, and vice versa. These findings support other work the OPC has undertaken with the SCAAT. This research has shown performance on this test is related to safety performance in safety-critical roles.

The Correct Score of Sub Test 1 was correlated with '*Ability to undertake and complete administrative tasks*' (3), a higher Correct Score was associated with higher ratings by the manager on ability to undertake administrative activities.

However, none of the Correct Scores were positively correlated with '*undertakes careful checks at all times'*. Instead, the results for sub-test 2 Correct Score were suggesting that employees with higher Correct Scores were gaining lower ratings on the job criterion. This finding is counter intuitive. Similar findings were not found for other parts of the SCAAT. It could therefore be suggested this is spurious. This could be explored in any further follow up study. The Omissions Scores for Sub Test 1 and 2 were significantly related to the ability to undertake careful checks at all times. More omissions were associated with lower ratings by the manager on 'undertaking careful checks at all times' and vice versa.

These results suggest that parts of the SCAAT are also related to the more clerical and checking components of the track work role.

The SCAAT was unable to predict overall job performance. This is not particularly surprising. The SCAAT is designed to assess some very key, but specific, job components that are likely to require effective concentration including clerical tasks and more importantly safety activities.

The Rules Acquisition Aptitude Test (RAAT)

It was predicted that the RAAT would be correlated with those aspects of job performance that involved the use, understanding and application of rules and regulations. This use and understanding would apply to both 'working alone' and 'working with others'. For example it was predicted that an understanding and aptitude for rules would propagate effective and safe communication.

The correlations between the RAAT and job performance are displayed in Table 13.

Personal Characteristics	RAAT
Ability and skills	
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.	
2. Analyse, understand and work with verbal information.	✓ Correlation = 0.288 n= 71 Significance p <0.05
3. Undertake and complete administrative tasks.	✓ Correlation = 0.239 n= 67 Significance p <0.05
4. Ability to work with a range of different equipment and tools.	
5. Introduce effective plans and make appropriate decisions.	✓ Correlation = 0.273 n= 64 Significance p <0.05
6. Remain vigilant and attentive for safety hazards or incidents.	
Working with others	
7. Communicates effectively with others.	✓ Correlation = 0.201 n= 72 Significance p <0.05
8. Manage and control others with confidence and assertiveness.	
9. Establish and maintain effective relationships with others and propagate team working.	
Motivations	
10. Motivated to follow rules and procedures.	
11. Undertakes careful checks at all times.	X Correlation = 0.171 N=68 Significance p = n.s*
12. Punctuality.	
Emotions	
13. Manages emergency and unexpected situations.	✓ Correlation = 0.269 n= 68 Significance p <0.05
Other key performance indicators	
14. Sickness record.	
15. Safety record.	X Correlation = 0 N=73 Significance p = n.s*
16. Overall job performance.	✓ Correlation = 0.268 n= 61 Significance p <0.05

* n.s = non significant

Table 13: Correlations between the RAAT and job performance.

The results in Table 13 indicate that the RAAT was modestly related to a range of job performance measures. Employees gaining higher scores on the RAAT were gaining higher scores on these job performance measures.

These measures included '*overall job performance'* (16) and then more specifically '*working with verbal information'* (2), '*undertaking administrative tasks'* (3), that will require the ability to read and follow instructions, and '*planning and making decisions'* (5), again this job requirement will require some aspect of reading and following instructions. Higher performance on the RAAT was also related to '*manages emergency and unexpected situations'* (13).

Interestingly high performance on the RAAT was related to higher ratings on '*Communicates effectively*' (7). It would appear that those track employees who have more skills at understanding written information are more effective at communicating verbally.

These job performance results for the RAAT are welcomed given that the test failed to predict success in training.

The Safe Personality Questionnaire (SAFEPQ)

It was predicted that the SAFEPQ would be correlated with a range of job performance measures, including overall job performance. The OPC's previous research in this area has identified that safe performance at work is a function of both ability and personality. Specifically it was predicted that:

1. Scale A '*Demonstrate a Willingness to Follow Rules and Procedures'* would be correlated with '*motivation to follow rules'* on the job and '*team working'*. Effective team working will require an employee to encourage and support team colleagues in the correct adherence to rules and procedures.
2. Scale B '*Calm in Emergency Situations'* would be correlated with a range of job performance measures involving planning and people. Working on the track can involve considerable time and people pressures. It was predicted therefore that employees who are more emotionally resilient are more likely to gain higher ratings on those job performance measures involving planning and making decisions in real time, and managing and controlling other people.
3. Scale C '*Responsible and Conscientious'* would be correlated with those aspects of job performance that would be enhanced by an employee's conscientiousness and taking responsibility, including '*undertake and complete administrative tasks'*, '*undertakes careful checks'* and '*punctuality'*.
4. Scale D '*Cautious and Patient Approach to Work'* would be correlated with those job performance measures that would benefit from an employee who is more cautious, thinks before he/she acts and is patient with others. In particular it was predicted scale D would be correlated with '*establish and maintain effective relationships*,' '*motivated to follow rules', 'undertake clerical checking*,' and '*undertake and complete administrative tasks*.'

The correlations between the SAFEPQ and job performance are displayed in Table 14 below.

Personal Characteristics	**A: Motivated to Follow Rules and Procedures**	**B: Calm in Emergency Situations**	**C: Responsible and Conscientious**	**D: Cautious and Patient Approach to Work**
Ability and skills				
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.				
2. Analyse, understand and work with verbal information.				
3. Undertake and complete administrative tasks.			X Correlation = 0 n= 38 Significance=n.s-	X Correlation = 0.162 n= 38 Significance= n.s-
4. Ability to work with a range of different equipment and tools.				
5. Introduce effective plans and make appropriate decisions.		✓ Correlation = 0.352 n= 39 Significance p <0.05		
6. Remain vigilant and attentive for safety hazards or incidents.				
Working with others				
7. Communicates effectively with others.		✓ Correlation = 0.357 n= 40 Significance p <0.05		
8. Manage and control others with confidence and assertiveness.		✓ Correlation = 0.318 n= 39 Significance p <0.05		
9. Establish and maintain effective relationships with others and propagate team working.	✓ Correlation = 0.371 N=39 Significance p < 0.05			✓ Correlation = 0.278 N=39 Significance p < 0.05

* n.s = non significant

Personal Characteristics	A: Motivated to Follow Rules and Procedures	B: Calm in Emergency Situations	C: Responsible and Conscientious	D: Cautious and Patient Approach to Work
Motivations				
10. Motivated to follow rules and procedures.	X Correlation = 0.129 N=40 Significance p = n.s*			X Correlation = 0.256 N=40 Significance p = 0.56
11. Undertakes careful checks at all times.			X Correlation = 0 n= 38 Significance p = n.s*	✓ Correlation = 0.349 N=39 Significance p < 0.05
12. Punctuality.			X Correlation = -0.106 n= 40 Significance p = n.s*	
Emotions				
13. Manages emergency and unexpected situations.		✓ Correlation = 0.333 N=39 Significance p < 0.05		
Other key performance indicators				
14. Sickness record.				
15. Safety record.	X Correlation = -0.255 n= 39 Significance p = n.s*		X Correlation = -0.327 n= 39 Significance p = n.s*	X Correlation= 0 n= 39 Significance p = n.s*
16. Overall job performance.	X Correlation = 0 n= 60 Significance p = n.s*	X Correlation = 0.178 n= 33 Significance p = n.s*	X Correlation= 0 n= 33 Significance p = n.s*	X Correlation= 0.158 n= 33 Significance p = n.s*

* n.s = non significant

Table 14: Correlations between the SAFEPQ and job performance

The results in Table 14 provide some support for the SAFEPQ, but these results need to be interpreted with some caution. The findings indicate that scores on the SAFEPQ personality scale '*Calm in Emergency Situations'* were related to a range of job performance measures including planning (5), communication (7), being assertive and confident with others (8), and managing unexpected situations (13). Those track employees who see themselves as more calm and relaxed and confident in difficult circumstances are more likely to gain higher ratings on the job.

These results suggest that performance on the track is partially attributable to the emotional level of the employee. The employee's emotionality is likely to impact on his/her planning skills, his/her ability to deal with others - particularly when he/she has to assert him/herself which will require self confidence and emotional control. His/her emotionality is also likely to impact on his/her ability to cope with difficult or unexpected situations.

Personality scale A was not correlated with its key job performance measure, '*motivation to follow rules*.' This was disappointing. It could be attributed to the manager finding it difficult to rate an employee on motivation to follow rules per se. Again, it may only be through observable work tasks can this be assessed.

Personality Scale A of the SAFEPQ '*Demonstrate a Willingness to Follow Rules'* and Scale D '*Cautious and Patient Approach to Work'* were both correlated with '*Establishes and maintains effective relationships with others* (9)'. This job performance measure also includes the ability to develop relationships with antagonistic people. Those who score high on scale D are more likely to be cautious and patient with others, think before they say anything and are not risky in their decision making when dealing with others. Those track workers who are higher on Scale A are likely to be more rule bound and to adhere to rules and procedures. They are more likely to resist pressure to break those rules when working with others. These characteristics may assist the track worker in helping the team to work to the set rules and clear guidelines, including what is expected of the team in terms of behaviour and work, and what he/she will and will not accept. This may all contribute to effective team working. Safe and effective teams will be those who are working within a set of agreed rules and guidelines. Those team members who are actively promoting the adherence to those rules will have a positive impact on team working.

Scale C of the SAFEPQ failed to be correlated with any of the key job performance measures. These findings were disappointing given that conscientiousness in the general psychological literature is often associated with effective job performance. This study suggests that track work performance may <u>not</u> be a function of an employee's conscientiousness. However any further research in this area might help to shed light on these initial findings.

Scale D of the SAFEPQ, ie, '*Cautious and Patient Approach to Work'* was positively correlated with undertaking careful checks (11). Those who were more cautious and patient are more likely to undertake careful checks. They will not tend to take risks, they are likely to enjoy or accept the boring

aspects of the work role and be cautious in their decision making. All these characteristics will assist the track worker in checking his/her work and making sure it is complete and safe.

Overall these results provide some early, but cautionary support for the importance of personality in track work performance. The findings suggest that some aspects of job performance are a function of emotional stability, demonstrating a willingness to follow rules, and a cautious and patient approach to work.

Summary and Discussion

Identifying the personal characteristics required of the safe and effective track worker

Innovative research

The first key stages of this work involved the OPC working with stakeholders to identify the key characteristics required for safe and effective performance with a range of safety-critical roles within the rail industry. This work has documented for the first time these key characteristics. This has been innovative research and it has identified and isolated the key qualities required for success within these roles. They have already been used to help inform the choice of assessment tools as discussed later.

Implications for training and development

Furthermore, in the future these characteristics can be used to help inform how the industry trains key personnel working on the track. The list of characteristics illustrates that a track worker's ability is key as is his/her interpersonal skills, personality and motivation. These are the key characteristics required for safe and effective performance on the track.

Therefore we should not only be recruiting against them but also training and developing these key characteristics in our track workers. For example, '*Managing others with confidence and assertiveness'* is key to the role of COSS and PICOP, but the question is do we train or develop these characteristics in COSS's or PICOP's? From the OPC's experience and from discussions with key experts from within the industry the answer is no. It is more rules and procedures training that is undertaken for track training, rather than personal development that enhances the people skills. The training is about developing hard skills and knowledge, eg, how to set up a possession or how to communicate, and not developing the softer skills.

Yet the research undertaken here illustrates that these other personal characteristics are key to safe and effective performance, including people skills and withstanding pressure from others to break the rules. There are excellent opportunities here to re-examine the training and incorporate more development components for these key roles. This will help equip key safety-critical employees with the knowledge and personal skills to behave safely and effectively.

This current research suggests that we should in particular be providing development and training in:

- managing time and people pressures, including pressures others had put the employee under to break the rules;
- assertiveness and confidence when dealing with others;
- making an effective contribution to team working and building teams; and,
- managing emotions and the demands of the work on the track.

Assessment tools are related to track training and track work performance

The validation has shown that an employee's performance during training can be related to his/her performance on a range of assessment tools. The results demonstrate that performance on the TWSE and SCAAT ability tests and scores on Scale B of the SAFEPQ personality questionnaire are related to ratings in training.

The findings also demonstrated that the performance on the RAAT, TWSE and SCAAT ability tests and the SAFEPQ personality questionnaire were related to job performance, and safety performance in the case of the SCAAT.

Cautionary interpretation and use of the validation findings

In both studies the correlations were not high, but were instead modest in value. These modest correlations indicate that there is some link between performance on these assessment tools and performance in training and on the job. We may have expected these correlations to have been higher. There may be a number of reasons as to why this might not have been the case: They include but are not limited to the following:

Small data samples – the sample sizes were modest to small and so may have limited the power of the correlational analyses undertaken. With smaller data sets there is a greater chance that rogue test or job performance data points distort the analysis undertaken.

Inappropriate selection of tests – the assessment tools selected may have been the wrong ones to use for track workers. However the research quoted has shown that the majority of these assessment tools have been developed for and used within the railway context. They also have validation evidence to support their use.

Inappropriate choice of job performance measures. The measures used in this study were based on thorough job analyses of each role and therefore this is unlikely to be a key factor.

Restriction of range. As indicated earlier in the report this could be a reason for the modest findings and statistical correction could have been undertaken to account for this, but the OPC decided against this.

Unreliability in the job performance measure. Managers may have found it difficult to reliably rate the employee on the chosen characteristic. Many of the employees that took part in the job performance validation would be working alone or with their peers, but without their manager/supervisor being present. This may have led to ratings being made that were not fully reliable, therefore undermining the validity of the ratings collected. As part of this study the OPC were unable to assess inter-rater reliability.

Job performance is a complex function of different factors. It may be the case that performance on some of the measures used in the job performance study are a complex function of different factors some individual and predictable factors (ie personality, ability, motivation etc), and some uncontrollable. One ability measure, personality scale, or aptitude may therefore only modestly predict the performance measure, more than one may provide incremental power. Take safety performance for example, the SCAAT correct score was modestly correlated with safety performance. However a track worker's safety record will be a function of a range of different factors (some controllable, others uncontrollable), only one of those factors will be the track worker's concentration ability. It is disappointing that delegates who took part in this study did not sit more than one assessment tool. This would have allowed more complex statistical techniques to be employed to assess the added value of additional assessment tools on predicting these complex job performance measures.

Limitations of this research programme

Whilst this research has provided some useful but preliminary findings, there are a number of limitations to the research. These include:

- the lack of support from across the industry – the work was undertaken primarily with one organisation. Therefore the generalisability of the findings needs to be undertaken with caution;
- sample sizes for the validation were in some cases small, again the results should be interpreted carefully. With larger sample sizes more confident interpretations could be made;
- using a predominantly concurrent validity model rather than a predictive validation study. This meant the research was undertaken with predominantly existing employees and not new recruits, for whom the recruitment process might be applied; and,
- inconclusive findings were identified for some of the assessment tools with some of the training and job performance measures, ie, an assessment tool was not correlated with its chosen job performance measure when it should have done.

Standing of the research

This research has demonstrated that some links have been identified between assessment tools and success in training and on the job. These links are modest in value and should be interpreted with caution, and further work should be undertaken to further these preliminary findings. This work should be a more comprehensive predictive validation study involving larger samples and more rail companies. Despite these caveats and limitations this current study does provide the industry with some useful findings that might help it to improve safety. These are discussed below.

These findings have a number of important implications

The findings demonstrate that a track worker's performance on ability and personality based assessment tools is related (to some modest extent) to his/her performance in training and on the job. These findings suggest that in the future the use of these or other similar tools as recruitment aids might assist employers to help improve track training and track performance, including those aspects of job performance that are linked to safety. However if they were to be used, prior to any further research being undertaken as alluded to earlier in this summary, then it should be with caution. The use of these types of assessment tool at recruitment may have a positive impact, either directly or indirectly upon the quality of track employees brought into the rail industry and their subsequent job and safety. As indicated the findings from this study are both preliminary and modest. However the impact of undertaking the track job in an unsafe manner can be enormous e.g. it could result in a major accident, costing lives and millions of pounds. Therefore in utility terms an assessment tool can have a positive impact on safety performance even with a small or weak statistical link with that performance measure.

As discussed earlier, effective training and competence assessment and re-assessment are just two key components of an effective safety management system. This project has been able to highlight that effective recruitment using suitable assessment tools is another key component that can help add value, and help to improve safety. Furthermore, employees who have been carefully selected and who have the right abilities, aptitudes and personal style are more likely to gain increased benefit from the training and the competence assessment processes. This will in turn help the training and competence assessment processes to be more effective overall.

The validation of assessment tools are very rarely carried out. This preliminary project has, for the first time, been able to demonstrate that if assessment tools are carefully selected for track work they can be empirically, albeit modestly, linked to performance in training and on the job. This could impact on training, job and safety performance. It may also affect the organisation's bottom line because they are more likely to recruit people who will be easier to train and will be more effective on the job.

The findings from this key study are in line with other work that the OPC has undertaken within the UK and in overseas rail companies. The OPC's work has successfully validated selection processes for Train Drivers, Signallers, Tram Drivers and Locomotive Drivers. In the case of Train Drivers test scores were linked to safety performance including Signals Passed At Danger (SPAD).

The findings from this work also illustrate some of the key personal characteristics that are identified as being linked to safe and effective performance on the track. Again this is novel research undertaken for the UK rail industry. This work suggests that more effective trainees have stronger abilities in integrating information (as measured through the TWSE) and concentrating (as measured through the SCAAT). They are also more emotionally stable and self confident.

The study also suggests that safe and effective employees working on the track are more likely to be:

- able to follow and understand rules and procedures;
- able to concentrate and be attentive;
- able to integrate information from different sources to make an effective decision;
- motivated to follow rules;
- calm, emotionally controlled and self confident; and,
- cautious and patient.

In the OPC's experience within the rail industry there is a misconception amongst some key players that many track employees need limited skills and that these are essentially manual handling skills. This is often reflected in the selection process that can be just a selection interview and focuses on their 'able-bodiness'. The competency profiling exercise and the trialing of assessment tools that assess key intellectual skills and personality characteristics, seriously question this view. Track employees do need to have some key intellectual, albeit basic skills to ensure their own and others safety. Indeed the personal characteristics derived from the competency profiling exercise explored in detail within this document supports this view. It demonstrates that effective track employees need to have a range of skills, abilities and personal characteristics. Furthermore these intellectual skills are likely to become increasingly important as an employee is promoted through the ranks.

The Effective Recruitment Process

A major aim of this project was to pilot a process for recruiting safe and effective employees within the UK rail industry. This is the first time this process has been used with track workers. The findings suggest this process, which is a first step, has had some degree of success. The project has tried to illustrate the key stages that an employer would need to go through when assembling a recruitment process for safety-critical employees. The stages are:

1. Undertake a comprehensive job analysis with job experts to identify the key personal characteristics required for safe and effective performance within the role.
2. Prepare, document and validate with job experts the key personal characteristics.
3. Assemble an assessment process by selecting or developing suitable but reliable and valid assessment tools to measure the desired characteristics.
4. Trial/use the assessment tools with the target group of employees.
5. Validate the assessment tools by demonstrating the link between the tool and success in training and more importantly job performance - ensuring that the training and job performance measures are appropriate, reliable and effective.
6. Update and refine the assessment process based on the outputs from the validation.
7. Continually monitor and review the assessment process.

These are in fact the best practice steps an informed assessor should be implementing for its selection processes.

In the OPC's experience most organisations just complete 3 and 4 without really undertaking a thorough job analysis. Assessment tools for selection are based on what is considered important and not what is important. This is particularly pertinent to track workers given that the job analysis has revealed characteristics that, to the OPC's knowledge, the industry has not been explicitly aware of, and more importantly has not used in its Human Resources processes for selecting, training and assessing track employees.

Furthermore in the OPC's experience validation (stage 5) is rarely undertaken by organisations. Many will continue to use selection processes for years without ever checking out to see if the selection process is empirically linked to success in training and on the job. As part of this research project the OPC has been able to complete the first 6 critical stages. Some of these stages have provided more confident conclusions than with others. The validation process that was undertaken has shown that the assessment tools demonstrated some degree of effectiveness. This is in part due to the key work undertaken with stages 1 and 2 where the key characteristics required for effective track work were carefully identified. It is this foundation stage that allowed the OPC to select the most appropriate selection tools.

This recruitment process can be shared with the industry as the first but important step towards a best practice process for recruiting safe and effective safety-critical employees.

Recommendations

- Share the findings from this research project with key stakeholders from within the rail industry.
- Encourage key stakeholders to implement effective recruitment programmes for key safety-critical employees within the industry applying the seven main best practice steps.
- Encourage the rail industry to carefully, and cautiously introduce effective and robust recruitment programmes for selecting track workers.
- Encourage the industry to undertake a more detailed and robust study into the effectiveness of these assessment tools.

Bibliography

Railway Safety-Critical Work. Dated 12 April 1999. Published by HSC.

Railway Safety Principles and Guidance. Guidance on Competence Management and Assurance Part 4 Section C. Dated 2000. Published by HSC

The RAAT Test Manual 1998. Published by the OPC

The SCAAT Test Manual 1997.. Published by the OPC

The TWSE Test Manual 2001. Published by the OPC

The SAFEPQ Manual. 1998. Published by the OPC

Appendices

Appendix 1: Summary of the personal characteristics for each safety-critical activity April 2001

Appendix 2: Track Workers Training Evaluation Form

Appendix 3: Track Workers Appraisal Form

Appendix 1

Summary of the Personal Characteristics for Each Key Safety-Critical Activity

Updated

October 2003

Overview

This document summarises the personal characteristics required of the rail employee or contractor undertaking any one of five key safety activities. For each safety critical activity the document outlines:

- the personal characteristics required for safe and effective performance;
- the essential and desirable personal characteristics; and,
- a full description of each personal characteristic.

These personal characteristics will be used to select/develop appropriate assessment tools that can be used at recruitment. Industry partners will then be invited to pilot the assessment tools in future recruitment programmes for these five safety-critical activities. The OPC Psychologists will then undertake a review of the pilot to identify those assessment tools that can predict those rail employees who are more likely to be safe and effective at work.

The table below summarises the relevance of the personal characteristics to each of the five safety-critical activities included as part of the pilot.

Personal Characteristics	F1 Inspecting Track	D2 Protecting Persons	D6/D7 Controlling the Movement of Trains	K3 Isolating the Traction Supply
Ability and skills				
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.	✓	✓	✓	✓
2. Analyse, understand and work with verbal information.	✓	✓	✓	✓
3. Undertake and complete clerical and administrative tasks.	✓	✓	✓	✓
4. Ability to work with a range of different equipment and tools.	✓			✓
5. Introduce effective plans and make appropriate decisions.		✓	✓	✓
6. Remain vigilant and attentive for safety hazards or incidents.	✓	✓	✓	✓
Working with others				
7. Communicates effectively with others.		✓	✓	✓
8. Manage and control others with confidence and assertiveness.		✓	✓	✓
9. Establish and maintain effective relationships with others and propagate team working.		✓	✓	✓
Motivations				
10. Motivated to follow rules and procedures.	✓	✓	✓	✓
11. Undertakes careful checks at all times.	✓	✓	✓	✓
Emotions				
12. Manages emergency and unexpected situations.	✓	✓	✓	✓

Table 1: The relevance of the personal characteristics to the five safety-critical activities included as part of the pilot.

The table below summarises the essential or desirable nature of the personal characteristics to each of the five safety-critical activities included as part of the pilot.

Personal Characteristics	F1 Inspecting Track	D2 Protecting Persons	D6/D7 Controlling the Movement of Trains	K3 Isolating the Traction Supply
Ability and skills				
1. Ability to identify faults, work with numerical information, analyse procedures, use diagrams, and reason with information.				
2. Analyse, understand and work with verbal information.				
3. Undertake and complete clerical and administrative tasks.				
4. Ability to work with a range of different equipment and tools.				
5. Introduce effective plans and make appropriate decisions.				
6. Remain vigilant and attentive for safety hazards or incidents.				
Working with others				
7. Communicates effectively with others.				
8. Manages and controls others with confidence and assertivenss.				
9. Establish and maintain effective relationships with others and propagate team working.				
Motivations				
10. Motivated to follow rules and procedures.				
11. Undertakes careful checks at all times.				
Emotions				
12. Manages emergency and unexpected situations.				

Table 2: The essential/desirable nature of the personal characteristics to the five safety-critical activities included as part of the pilot programme.

Key Essential Desirable Dependent on role

D6 Controlling the Movement of Trains (In/Out of a Possession)
D7 Controlling the Movement of Trains (Within a Possession)

Personal Characteristics

1. Analyse Numerical Information

The employee is able to use his/her numerical reasoning skills to analyse and summarise numerical information. This includes working out sighting distances, clearances, mileage's and managing and estimating time effectively.

2. Analyse Procedures, Fault Find, Reason Logically

The employee is effective at reading a complex or plain drawing to ensure all information is included and correct. He/she is able to look at and use reference information to enable him/her to come to a safe decision. He/she is able to break a procedure down into logical steps.

3. Analyse, Interpret and Use Written and Verbal Information

The employee controlling the movement of trains is able to work and reason with a range of verbal and written information. He/she will use these verbal reasoning skills to follow instructions, interpret correctly laws and agreements and follow logical instructions.

Examples

- Listen to verbal instructions from supervisors.
- Analyse written information.
- Summarise verbal information.

- Interpret correctly rules and agreements.
- Provide clear written information about a problem or task.

4. Undertake Clerical and Administrative Tasks Efficiently and Effectively

The individual needs to complete a range of clerical and administrative tasks. These skills and abilities are used to complete and collate information. He/she will keep, categorise, classify, and collate detailed records of events and information. He/she undertakes routine administrative tasks including filling out structured documentation and forms.

Examples

- Keep detailed records.
- Keep records of work undertaken.
- Fill out forms or other structured documentation.
- Classify/collate/categorise information.

5. Introduce Effective Plans and Make Effective Decisions

The employee is effective at preparing and implementing a plan of action. He/she is able to plan a logical sequence of events. This includes deciding work priorities, allocating resources including people, machinery and equipment. He/she is effective at modifying the plan to take account of changed circumstances and recognises new levels of risk and manages them accordingly.

Example

- Plan a logical sequence of events.
- Revise plan to take account of changed circumstances.
- Decide working within strict guidelines.
- Allocate resources.
- Make decisions under time pressures.
- Decide on course of action in conjunction with others and based on own initiative.
- Is alert to changing circumstances and the impact on work.

6. Actively Seeks out Safety Hazards or Incidents

The effective employee is aware of and actively manages safety hazards or incidents. He/she is proactive at looking out for and reacting to situations that have the potential to become safety hazards or incidents over time or with a change of circumstance.

Examples

- Note and react to unusual occurrences.
- Watch to see if a dangerous situation does occur.
- Listen or detect if a dangerous situation does occur.
- Watch for signals.
- Note danger or warning signals.
- Identify where safety situations might occur.

7. Communicates Effectively With Others

The employee is an effective communicator. He/she asks questions and actively listens to establish information and key facts before acting. He/she tailors the communication to the needs of each audience to maximise understanding. He/she then checks to ensure that others fully understand by asking questions.

Examples

- Give verbal instructions to colleagues.
- Ask questions to establish information.
- Brief individuals on tasks.
- Explain technical points in lay person's terms.
- Make verbal reports to a higher authority.
- Provide clear verbal information about a situation.
- Checks/ensures others fully understand.
- Speaks clearly and concisely.
- Listens to others to establish information.

8. Manage and Control Others With Confidence and Assertiveness

The employee is effective at managing and controlling others during a possession. He/she is assertive and confident when managing others, ensuring rules and procedures are complied with and in giving instructions. He/she is effective at influencing others including those over whom he/she has no direct control. He/she maintains confidence and asserts him/herself when saying 'no' to others and when managing more senior colleagues.

Examples

- Ensure safety procedures are observed.
- Supervise to ensure compliance with rules.
- Give orders to work.
- Chase people to expedite completion of a task.
- Capable of saying 'no' to others.

9. Establish and Maintain Effective Relationships With Others and Propagate Team Working

The employee has well developed interpersonal skills. He/she finds it easy to establish and maintain a rapport with a whole range of different people. He/she is effective at establishing working relationships with antagonistic individuals. His/her team working skills help him/her to encourage co-operation between team members, overcome team conflict and remain impartial.

Examples

- Establish rapport with new contacts.
- Liase with clerical/manual employees.
- Reduce tension between people.
- Establish relationships with antagonistic people.
- Encourage co-operation between team members.
- Avoid emotional involvement.

10. Motivated to Follow Rules and Procedures at all Times

The employee that controls the movement of trains is motivated to follow rules and procedures at all times. He/she will resist pressure from others to take short cuts or to finish the job quickly eg at the end of a shift. Under time pressure he/she will still adhere to the rules and regulations. He/she enjoys following rules and takes responsibility for safety and ensures safety precautions are observed at all times.

Examples

- Follows logical and written rules and procedures at all times without taking shortcuts.
- Follows rules despite time pressures or pressure from others.
- Motivated to keep records at all times.

11. Undertake Careful Checks and Record Key Information

The employee responsible for controlling the movement of trains undertakes routine and regular checks as part of his/her work. He/she checks that work is being carried out and schedules are adhered to. The employee double checks work and does not make assumptions.

Examples

- Checks that management of a possession is completed to a set standard.
- Checks that work is being carried out.
- Checks adherence to schedule.
- Double checks work doesn't make assumptions.

12. React and Respond to Emergency and Unexpected Situations Effectively

The employee responsible for controlling the movement of trains is effective at reacting to and coping with the demands of emergency and/or unexpected events. He/she remains calm and composed. He/she directs action where necessary, issues directions and initiates actions in an emergency.

Examples

- Direct action in emergencies.
- Cope with unexpected situations.
- Issue directions in an emergency.
- Initiate action in an emergency.

F1 Inspecting Track

Personal Characteristics

1. Ability To Use The Appropriate Reasoning Skills to Identify Faults and Work With Information

He/she is able to work with and use his/her reasoning and analytical skills to summarise numerical data, diagnose potential problems and take in and integrate information from different sources to make the right decision.

Examples

- Diagnose problems on the infrastructure.
- Summarise and work with basic numerical information.
- Diagnose potential problems.
- Take in and integrate information from different sources.

2. Analyse, Understand and Work With Verbal and Written Information

The employee inspecting track is able to work and reason with a range of verbal and written information. He/she will use these verbal reasoning skills to follow printed instructions, interpret correctly laws and agreements and follow logical instructions.

Examples

- Follows written instructions.
- Follows printed instructions.
- Follows instructions given by word of mouth.
- Interpret correctly rules, laws and agreement.
- Follows logical instructions to create a system.

3. Undertake and Complete Routine Clerical and Administrative Tasks Efficiently and Effectively

The safety critical activity of inspecting track requires the individual to complete a range of clerical and administrative tasks. These skills and abilities are used to compile and collate information. He/she will keep, categorise, classify and collate detailed records of events and information. He/she undertakes routine administrative tasks including filling out structured documentation and forms.

Examples

- Compile information.
- Collate information.
- Categorise or classify information.
- Keep detailed records of events occurring.
- Fill out forms or other structured documentation.
- Keep records of work undertaken.
- Produce neat handwriting.

4. Ability and Physical Capability to Work With a Range of Different Equipment and Tools

The individual has the physical capability and ability to work with a range of different equipment and tools, effectively, efficiently and safely. These tools are likely to include long handed tools and instruments. These tools will be used to strike/hammer objects and clean and repair equipment.

Examples

- Use selection tools and assessment.
- Use long handed tools or implements.
- Use non-precision tools or instruments.
- Striking or hammering objects.
- Cleaning/oiling machinery.
- Repairing and carrying out minor repairs to equipment.

5. Remain Vigilant and Attentive for Safety Hazards or Incidents

He/she is able to remain vigilant and watch out for safety hazards, or warning symbols over a long period of time. He/she is able to maintain concentration whilst undertaking a repetitive and at times boring job over extended periods of time. He/she is able to detect actual or potential safety hazards with materials or equipment, and to take the necessary course of action. He/she is able to anticipate problems and detect deterioration over time and to decide when to intervene and when to correct a fault.

Example

- Note unusual occurrences/defects.
- Listen or detect to see if a dangerous situation occurs.
- Note danger or warning symbols.
- Watch to see if a dangerous situation occurs.
- Undertake a repetitive task.
- Remain vigilant for long periods of time.

6. Communicates Effectively With Others

The employee is an effective communicator. He/she asks questions and actively listens to establish information and key facts before acting. He/she tailors the communication to the needs of each audience to maximise understanding. He/she then checks to ensure that others fully understand by asking questions.

Examples

- Give verbal instructions to colleagues.
- Ask questions to establish information.
- Explain technical points in lay person's terms.
- Make verbal reports to a higher authority.
- Provide clear verbal information about a situation.

- Checks/ensures others fully understand.
- Speaks clearly and concisely.
- Listens to others to establish information.

7. Motivated to Follow Rules and Procedures

The employee who inspects track is motivated to follow rules and procedures at all times. He/she will resist pressure from others to take short cuts or to finish the job quickly eg at the end of the shift. Under time pressure he/she will still adhere to the rules and regulations. He/she enjoys following rules and takes responsibility for safety and ensures safety precautions are observed at all times.

Examples

- Motivated to follow rules and procedures at all times and does not become complacent when following rules.
- Follows rules despite time pressures or pressure to finish a job quickly.
- Follows rules and procedures in full with no shortcuts.
- Follows procedures even when they are familiar.
- Withstand pressure from others to break the rules.
- Ensure safety precautions are observed.
- Takes responsibility for safety.
- Motivated to keep good records.

8. Undertakes Careful Checks at all Times

He/she undertakes routine and regular checks as part of his/her work. He/she enjoys completing and double checking work to ensure that it is to a set standard and/or defects or errors are identified. He checks work and does not make assumptions.

Examples

- Undertakes regular checks and examination of the entire infrastructure.
- Checks that work is completed to a set standard.

- Checks adherence to schedules.
- Examines equipment for gross/fine defects.

9. React and Respond to Emergency and Unexpected Situations

The employee is effective at responding to and coping with the demands of emergency and/or unexpected events. He/she remains calm and composed and is able to analyse what is required and to make effective and timely decisions. He/she will initiate action in an emergency and take control if necessary.

Examples

- Follows procedures in an emergency.
- Initiate action in an emergency.
- Cope with an unexpected situation during a physical operation or process.
- Analyses when an emergency occurs and selects the appropriate response.

D2: Protecting Persons

Personal Characteristics

1. Analyse and Work With Numerical Information

The employee is able to use his her numerical reasoning skills to analyse and summarise numerical information. This includes working out sighting distances, clearances, mileage's and managing and estimating time effectively.

1b. Analyse Procedures, Fault Find and Reason Logically

The employee is effective at reading a complex or plain drawing to ensure all information is included and is correct. He/she is able to look at and use reference information to enable him/her to come to a safe decision. He/she is able to break a procedure down into logical steps.

2. Analyse, Understand and Recall Written and Verbal Information

The employee protecting persons is able to work and reason with a range of verbal and written information. He/she will use these verbal reasoning skills to follow instructions, interpret correctly laws and agreements and follow logical instructions.

Examples

- Listen to verbal instructions from supervisors.
- Peruse written information for useful content.
- Remember instructions given verbally/in writing over short and long term.
- Analyse written information.
- Summarise verbal information.
- Interpret rules and agreements.

3. Undertake and Complete Routine Clerical and Administrative Tasks Efficiently and Effectively

The safety critical activity of protecting others requires the individual to complete a range of clerical and administrative tasks. These skills and abilities are used to complete and collate information. He/she will keep, categorise, classify, and collate detailed records of events and information. He/she undertakes routine administrative tasks including filling out structured documentation and forms.

Examples

- Keep detailed records of events/occurrences.
- Fill out forms and other structured documentation.
- Produce neat handwriting.

4. Introduce Effective Plans and Make Decisions

The employee is effective at preparing and implementing a plan of action. He/she is able to plan a logical sequence of events. This includes deciding work priorities, allocating resources including people, machinery and equipment. He/she is effective at modifying the plan to take account of changed circumstances and recognises new levels of risk and manages them accordingly.

Examples

- Plan a course or route.
- Plan staffing levels.
- Plan a logical sequence of events.
- Revise plan to take account of changed circumstances.
- Decide work priorities.
- Allocate resources.
- Decide a course of action on own initiative/in conjunction with others.
- Make decisions after thorough evaluation if even under time pressure.

5. Actively Seek Out Safety Hazards or Incidents

The effective employee is aware of and actively manages safety hazards or incidents. He/she is proactive at looking out for and reacting to situations that have the potential to become safety hazards or incidents over time, or with a change of circumstance.

Examples

- Listen or detect a dangerous situation.
- Watch to see if a dangerous situation is likely to occur.
- Note unusual occurrences.
- Note danger or warning signs.
- Pick up on when things go wrong and act accordingly.
- Watch to detect a problem.

6. Communicates Effectively With Others

The employee is an effective communicator. He/she asks questions and actively listens to establish information and key facts before acting. The employee tailors the communication to the needs of each audience to maximise understanding. He/she then checks to ensure that others fully understand by asking questions.

Examples

- Gives clear verbal instructions to others.
- Advises on technical points.
- Inform/brief workers or staff of tasks/situation/policies.
- Communicates effectively using appropriate methods eg face to face, telephone, radio.
- Explain technical information in lay terms.
- Provide clear spoken information.
- Good listening skills for collecting information.
- Checks/ensures others fully understand.
- Asks questions to establish information.

7. Manage and Control Others With Confidence and Assertiveness

The employee is effective at managing and controlling others. He/she is assertive and confident when managing others, ensuring rules and procedures are complied with and in giving instructions. He/she is effective at influencing others including those over whom he/she has no direct control. He/she maintains confidence and asserts him/herself when saying 'no' to others and when managing more senior colleagues.

Examples

- Ensure a safe system is observed.
- Challenges things that are unsafe.
- Supervise/review to assess compliance with rules.
- Give instructions.
- Direct others in safe systems.
- Ability to say No and remove people from site.

8. Establish and Maintain Effective Relationships with Others and Propagate Team Working

The employee has well developed interpersonal skills. He/she finds it easy to establish and maintain a rapport with a whole range of different people. He/she is effective at establishing working relationships with antagonistic individuals. His/her team working skills help him/her to encourage co-operation between team members, overcome team conflict but remain impartial.

Examples

- Establish rapport with new contacts.
- Liase with clerical/manual employees.
- Reduce tension between people.
- Establish relationships with antagonistic people.
- Encourage co-operation between team members.
- Avoid emotional involvement.

9. Motivated to Follow Rules and Procedures

The employee is motivated to follow rules and procedures at all times. He/she will resist pressure from others to take short cuts or to finish the job quickly eg at the end of the shift. Under time pressure he/she will still adhere to the rules and regulations. He/she enjoys following rules and takes responsibility for safety and ensures safety precautions are observed at all times.

Examples

- Motivated to follow rules and procedures at all times.
- Follows rules despite time pressures or pressure to finish the job quickly.
- Follows rules and procedures in full with no shortcuts.
- Follows procedures even when they are familiar.
- Withstands pressures from others to break the rules.
- Motivated to keep up to date and effective records.

10. Undertakes Careful Checks at all Times

The employee undertakes routine and regular checks as part of his/her work. He/she checks critical documentation and certification is correct and that a system is safe for working. The employee checks and double checks a job and he/she doesn't make assumptions. He/she will continue to check despite time, work pressure or pressure from others.

Examples

- Checks critical documentation and certification is correct.
- Checks formal authorisation.
- Checks that a physical process has taken place.
- Checks that others understand what to do.
- Checks the detail of a task/job.
- Checks/tests a system for safe working.
- Checks and does not make assumptions.

11. React and Respond to Emergency and Unexpected Situations

The employee is effective at reacting to and coping with the demands of emergency and/or unexpected events. He/she remains calm and composed. He/she directs action where necessary, issues directions and initiates actions in an emergency.

Examples

- Note something unsafe and act accordingly.
- Direct action in an emergency.
- Cope with unexpected situation during operation or process.
- Issue directions in an emergency.
- Initiate action in an emergency.
- Analyse an emergency/unexpected event and select appropriate response.

K3: Isolating the Traction Supply

Personal Characteristics

1. Analyse Procedures, Use Diagrams and Fault Find

He/she is effective at reading a complex plan or diagram. He/she is able to identify faults/ problems and inconsistencies in systems. In addition he/she is effective at following logical instructions and following printed diagrams.

Examples

- Read a complex plan or diagram.
- Follow printed diagrams.
- Identify inconsistencies in system.
- Identify faults/problems in machinery.
- Break down a procedure into logical steps.
- Follow logical instructions to operate a process.
- Refer to reference materials.

2. Analyse, Interpret and Use Written and Verbal Information

The employee isolating the traction supply is able to work and reason with a range of verbal and written information. He/she will use these verbal reasoning skills to follow instructions, interpret correctly laws and agreements and follow logical instructions.

Examples

- Interpret rules and information.
- Analyse written information.
- Follow instructions given by mouth.
- Fill out forms or other structured documentation.

- Remember instructions given verbally and in writing over a short/long period of time.

3. Undertake Clerical and Routine Administrative Tasks Efficiently and Effectively

The employee responsible for isolating the traction supply completes a range of clerical and administrative tasks. These skills and abilities are used to complete and collate information. He/she will keep, categorise, classify, and collate detailed records of events and information. He/she undertakes routine administrative tasks including filling out structured documentation and forms.

Examples

- Sorting information.
- Filling out forms and other structured documentation.
- Neat handwriting.

4. Ability to Work Safely with a Range of Different Equipment and Tools

The individual has the physical capability and ability to work with a range of different equipment and tools, effectively, efficiently and safely. These tools are likely to include long handed tools and instruments. These tools will be used to strike/hammer objects and clean and repair equipment.

5. Introduce Effective Plans and Make Effective Decisions

The employee responsible for isolating the supply is effective at preparing and implementing a plan of action. He/she is able to plan a logical sequence of events. He/she is effective at modifying the plan to take account of changed circumstances and recognises new levels of risk and manages them accordingly.

6. Remain Vigilant and Attentive for Safety Hazards or Incidents

He/she is able to remain vigilant and watch out for safety hazards, or warning symbols over a long period of time. He/she is able to maintain concentration whilst

undertaking a repetitive and at times a boring job over extended periods of time. He/she is able to detect actual or potential safety hazards with materials or equipment and to take the necessary course of action. He/she is able to anticipate problems and detect deterioration over time and to decide when to intervene and when to correct a fault.

Examples

- Note danger or warning signs.
- Watch to see if a dangerous situation occurs.
- Watch out for safety incidents.
- Remain focused on the task and is not easily distracted.

7. Communicates Effectively With Others

He/she is an effective communicator. He/she asks questions and actively listens to establish information and key facts before acting. He/she tailors the communication to the needs of each audience to maximise understanding. He/she then checks to ensure that others fully understand by asking questions.

Examples

- Asks questions to establish information.
- Tailors communication to the needs of the recipient.
- Gives clear and accurate instructions to others.
- Summarises verbal information.
- Ensures/checks that others fully understand.
- Communicates via radio/telephone.

8. Manage and Control Others With Confidence and Assertiveness

The employee responsible for isolating the traction supply is effective at managing and controlling others. He/she is assertive and confident when managing others, ensuring rules and procedures are complied with and in giving instructions. He/she is effective at influencing others including those over whom he/she has no direct control. He/she

maintains confidence and asserts him/herself when saying 'no' to others and when managing more senior colleagues.

Examples

- Give instructions to others.
- Directly supervise others.
- Chase people to expedite completion of work while ensuring a safe system is observed.
- Capable of saying 'no' to people.

9. Establish and Maintain Effective Relationships with Others and Propogate Team Working

He/she finds it easy to establish and maintain a rapport with a whole range of different people. He/she is effective at establishing working relationships with antagonistic individuals. He/she uses his/her team working skills to help him/her to encourage co-operation between team members, overcome team conflict and remain impartial.

10. Motivated to Follow Rules and Procedures

The employee responsible for isolating the track supply is motivated to follow rules and procedures at all times. He/she will resist pressure from others to take short cuts or to finish the job quickly eg at the end of the shift. Under time pressure he/she will still adhere to the rules and regulations. He/she enjoys following rules and takes responsibility for safety and ensures safety precautions are observed at all times.

Examples

- The motivation to follow rules and procedures at all times.
- Able to withstand pressure from others or time pressure to break rules or compromise.
- Ensure safety precautions are observed at all times.
- Keep detailed records of events/work undertaken.
- Motivated to fill out forms or other structured documentation.

11. Undertake Careful Checks at all Times

The employee responsible for isolating the traction supply undertakes routine and regular checks as part of his/her work. He/she checks that work is being carried out, checks that others understand before proceeding and that critical documentation and certification is correct.

Example

- Check and double check work even when personally convenient not to do so.
- Verify the accuracy of information.
- Checking work is completed on time.
- Checks others' understanding before proceeding.
- Checks work is completed to a set standard.
- Critical documentation and certification is correct.

12. React and Respond to Emergency and Unexpected Situations Effectively

The employee responsible for isolating the traction supply is effective at managing and coping with the demands of emergency and/or unexpected events. He/she remains calm and composed. He/she directs action where necessary, issues directions and initiates actions in an emergency.

Examples

- Initiate action in emergencies.
- Cope with unexpected situations.
- Analyse emergency/unexpected situations and select appropriate action.

Appendix 2

Track Workers' Training Evaluation Form

This form is designed to collect training performance for Track Workers that have recently undertaken training. For each trainee please complete one form. The information detailed on this form will remain confidential. Place the completed forms in the envelope provided, seal the envelope then either hand it back to you coordinator or place it in the post. No stamp is required.

Thank you for your help

Personal Details

	First name	Surname
Trainee's Name		
Trainee's date of birth (if known)	/ /	

Training Performance

1. How would you rate the Trainees' <u>overall</u> training performance? (tick box)

☐ Very poor ☐ Worse than most Trainees ☐ Slightly worse than most Trainees ☐ Average or typical of Trainees ☐ Slightly better than most Trainees ☐ Better than most Trainees ☐ Excellent

2. How would you rate the Trainees' ability to learn new information in training?

☐ Very poor ☐ Worse than most Trainees ☐ Slightly worse than most Trainees ☐ Average or typical of Trainees ☐ Slightly better than most Trainees ☐ Better than most Trainees ☐ Excellent

3. How would you rate the Trainees' positive contribution to training?

☐ Very poor ☐ Worse than most Trainees ☐ Slightly worse than most Trainees ☐ Average or typical of Trainees ☐ Slightly better than most Trainees ☐ Better than most Trainees ☐ Excellent

4. How would you rate the Trainees' motivation and desire to learn?

☐ Very poor ☐ Worse than most Trainees ☐ Slightly worse than most Trainees ☐ Average or typical of Trainees ☐ Slightly better than most Trainees ☐ Better than most Trainees ☐ Excellent

Training Scores

Please list any training exams or tests the Trainee has sat in training. Please include the mark attained or the result.

Training Course/ Test/ Exam	Result/Score %

Appendix 3

Track Worker/Contractor Validation Form: Performance Indicators

Designed specifically for the validation of the Track Worker/Contractor Assessment Centre

Spring 2003

STRICTLY PRIVATE AND CONFIDENTIAL

	First Name	Surname	Date Entered Service as a Track Worker/Contractor (if known):
Name of Track Worker/ Contractor (in full):			
Date of Birth (if known):			

1. Motivated to follow rules and procedures

Follows rules and procedures at all times, resists peer pressure to take short cuts/finish job quickly. Will adhere to rules and regulations under time pressure, will take responsibility for safety and ensures precautions are observed at all times. *Place a cross in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Is complacent* when following rules.
- *Forgets/omits* to follow rules under pressure, takes short cuts to finish job quickly, eg, at end of a shift.
- *Does not* follow procedures when familiar, eg, cuts corners, and *frequently* breaks rules under peer pressure
- *Does not* take responsibility for safety precautions nor ensures precautions are undertaken.
- *Fails* to keep *any* records.

☐ 2. Below typical

☐ 3.Typical

- Is *generally* motivated to follow rules.
- *Usually* follows rules under pressure and does not take short cuts to finish a job quickly.
- *Generally* follows procedures even when familiar, resists pressure to break rules by peers.
- *Generally* takes responsibility for safety and ensures safety precautions are undertaken, and usually manages to keep good records.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- Is *very* motivated to follows rules and procedures at all times.
- *Always* follows rules despite time pressure and *never* takes short cuts to finish the job quickly.
- *Always* follows procedures even when familiar and *never* breaks rules under peer pressure.
- *Is willing* and takes responsibility for safety and ensures safety precautions are undertaken at all times.
- Will *always* keep good, comprehensive and thorough records

2. Undertake careful checks at all times

Undertakes routine and regular checks, to ensure work meets set standards and/or defects or errors are identified. Willing to check work even under time pressure and does not make assumptions. Make sure critical documentation and certification is correct. Place a cross *in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Does not* check work is completed on time.
- *Does not* check that the work is completed to a set standard *or* that schedules are adhered to.
- *Fails* to check critical documentation and certification is correct.
- *Fails* to check others' understand what to do.

☐ 2. Below typical

☐ 3.Typical

- Checks work is completed in time in *general*.
- *Most of the time* checks that work is completed to set standards and that schedules are adhered to.
- *Generally* checks critical documentation and certification is correct.
- *Usually* checks others' understand what to do.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- *Always* checks work is completed on time, eg, does not make assumptions.
- *Always* checks work is completed to set standards and that schedules are adhered to.
- *Always* checks critical documentation and certification is correct.
- *Always* checks others' understand what to do

3. Manages emergency and unexpected situations

Is able to remain calm and composed and can manage effectively the demands of an emergency and/or unexpected event. Can make decisions and will initiate action and take control if necessary. *Place a cross in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Is unable* to follow procedures in an emergency.
- *Lacks confidence* in analysing and initiating an appropriate *response* in an emergency.
- *Is unable* to cope with an unexpected situation during a physical operation or process

☐ 2. Below typical

☐ 3.Typical

- *Usually* follows procedures in an emergency.
- *Generally* able to analyse and initiate an appropriate response.
- Can *usually* cope with an unexpected situation during a physical operation or process.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- *Always* follows procedures in an emergency.
- *Can be relied on to analyse and initiate* an appropriate response to an emergency.
- Can *always* cope with an unexpected situation during a physical operation or process – will take control if necessary.

4. Ability to identify faults, works with numerical information, analyse procedures, use diagrams and reason with information

The ability to summarise numerical data, diagnose problems and integrate information from different sources to make the right decision. Place a cross *in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Frequently* mis-diagnoses potential problems or faults in the system.
- *Struggles* to summarise and work with basic information both numerical and with diagrams.
- *Is often inaccurate* in integrating information from different sources.
- Finds *it difficult* to follow logical instructions, eg, procedures

☐ 2. Below typical

☐ 3.Typical

- *Generally* is able to diagnose potential problems and faults in a system only sometimes making an error.
- *Is competent* in summarising and working with basic information both numerical and with diagrams. His/her work is generally free of errors.
- *Most of the time* he/she is able to follow logical instructions, eg, procedures.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- *Always* diagnoses potential problems and problems in the infrastructure. Is consistently accurate in diagnosing faults.
- *Always* summarises concisely and is accurate working with basic numerical information and diagrams. Never makes an error with such information.
- *Always* integrates information from different sources accurately, and makes the right decision.
- *Always* follows logical instructions with ease, eg, breaking procedures down into easy to follow steps.

5. Analyse, understand and interpret verbal and written information

The ability to work and reason with a range of verbal and written information. Use verbal reasoning skills to follow printed, logical instructions. *Place a cross in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Consistently* fails to follow/remember written/printed and oral instructions.
- Has *difficulty* interpreting rules, laws and agreements correctly.
- Has *difficulty* summarising verbal information.

☐ 2. Below typical

☐ 3.Typical

- *Generally* able to follow/remember written/printed and oral instructions.
- Is *usually* able to interpret rules, laws and agreements correctly, but can sometimes make mistakes.
- *Generally* able to summarise verbal information, shys away from more complex information.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- *Always* able to follow/ and easily remembers written/printed and oral instructions without a problem.
- *Always* interprets rules, laws and agreements correctly and without making mistakes.
- *Always* summarises verbal information succinctly and without mistakes.

6. Ability and physical capability to work with a range of different equipment and tools

The ability and the capability to work with a range of different equipment and tools effectively, efficiently and safely. Place a cross *in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *In general* he/she uses tools incorrectly, eg, using a non-precision instrument for precision work.
- *Fails* to look after machinery, eg, does not clean/ oil machinery,

☐ 2. Below typical

☐ 3.Typical

- *Generally* uses equipment and tools correctly. Only occasionally may use an inappropriate equipment.
- Usually looks after machinery with care.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- *Always* uses equipment and tools correctly and appropriately, eg, using a long handled tool for hammering objects.
- *Always* looks after machinery with great care, eg, repairing equipment if required.

7. Undertake and complete routine clerical and administrative tasks efficiently and effectively

The ability to complete a range of clerical and administrative tasks. Involving compiling, filing, collating categorising and classifying information, and keeping records. *Place a cross in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Unable* to collate/compile information, and fill in forms correctly.
- *Unable* to correctly categorise and classify information.
- *Frequently* fails to keep detailed records of events and work undertaken

☐ 2. Below typical

☐ 3.Typical

- *Generally* collates, compiles information and is able to fill in forms correctly. May sometimes make an error.
- *Generally* correctly categorises and classifies information correctly.
- *Usually* keeps detailed records of events and work undertaken. Occasionally may fail to record an event or work done.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- *Always* collates, compiles information and fills in forms accurately without any errors, eg, fills in structured documents without any mistakes.
- *Always* correctly categorises and classifies information, eg, by keeping an effective/efficient filing system.
- *Always* keeps detailed records of events and work undertaken using neat handwriting.

8. Remain vigilant and attentive for safety hazards or incidents

The ability to remain vigilant over a long period and maintain concentration when watching out for safety hazards/performing repetitive tasks. Be able to detect actual or potential hazards with material or equipment and take appropriate action if necessary. Place a cross *in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Consistently* fails to detect actual or potential safety hazards, eg, unusual occurrences, danger or warning signs.
- *Unable* to anticipate potential problems and detect deterioration over time, eg, cannot remain vigilant for long periods of time.
- *Easily distracted* and cannot undertake repetitive tasks involving concentration for long periods, eg, watching and listening to see if a dangerous situation occurs or watch out for safety incidents.

☐ 2. Below typical

☐ 3.Typical

- *Usually* notices major changes – detects actual or potential safety hazards, eg, notices warning/danger symbols.
- *Generally* able to anticipate potential problems and detect deterioration over time, eg, can usually correctly decide when to intervene and when to correct a fault.
- *Generally* attentive and therefore able to undertake repetitive tasks not involving concentration for *long* periods.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- *Always* attentive and detects actual or potential safety hazards.
- *Always* able to anticipate potential problems and detect deterioration over time and able to take the necessary course of action, eg, intervene if required.
- Is *very attentive* and is able to undertake repetitive tasks involving concentration over long periods of time, remaining vigilant, to and listening to detect if a dangerous situation occurs.

9. Communicates effectively with others

The ability to communicate effectively with others, involving actively listening and tailoring communication to the needs of the audience. *Place a cross in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Mumbles* or is *unclear* in verbal communication to others, eg, instructions given are unclear.
- *Unable* to adapt information to ensure a clear understanding to others.
- *Fails* to listen carefully to information and therefore leaves out important factors.
- *Fails* to check whether others fully understand.

☐ 2. Below typical

☐ 3.Typical

- *Generally* verbal communication with others is clear, eg, uses appropriate methods of communication such as face to face, instructions given as clear.
- *Usually* able to adapt information to ensure others' understand, eg, explains technical information in lay terms, but may sometimes fully achieve this.
- *Generally* listens carefully to information – but may sometimes miss out details.
- *Generally* checks that others fully understand.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- Verbal communication to others is *always* clear and concise, eg, asks questions to check/ensure others fully understand.
- *Consistently* adapts information to tailor it for target audience. When advising on technical points explains it in lay terms to ensure everyone understands.
- *Always* listens carefully to information, eg, by asking questions to establish information and key facts before advising on action.
- *Always* checks that others fully understand, eg, by asking questions

10. Manage and control others with confidence and assertiveness

The ability to effectively manage and control others. Is assertive and ensure rules and procedures are compiled with. Place a cross *in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Shys* away and *lacks confidence* giving instructions to others.
- Is *not assertive* when directly supervising others, eg, when saying 'no' to others.
- *Frequently does not* chase people to encourage completion of task.
- *Frequently* overlooks things to ensure compliance of rules by others.

☐ 2. Below typical

☐ 3.Typical

- In *general* able to give instructions to others with some confidence – but lacks confidence in certain situations, eg, in large groups.
- Will *generally* be assertive when directly supervising others.
- *Sometimes* fails to chase people to encourage completion of a task.
- *Generally* ensure compliance of rules by others.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- *Demonstrates* confidence and assertive body language when giving instructions to others.
- *Is very assertive* commanding body language when directly supervising others when saying 'no' to others.
- *Always* chases people to encourage completion of task.
- *Always* ensures compliance of rules by others.

11. Introduce effective plans and make decisions

The ability to prepare and implement a plan of action and being able to modify/adapt the plan to take account of changed circumstances. Also to recognise new levels of risk and manage them accordingly.

Place a cross in the appropriate box.

☐ Don't know

☐ 1. Poor

- Has *difficulty* planning a logical sequence of events.
- *Fails* to revise plans to take account of changed circumstances, eg, cannot foresee how changing circumstances has an impact on work.
- *Consistently lacks confidence* in making decisions when under time pressure, eg, using own initiative to allocate resources.
- Has *difficulty* planning work priorities, resources, staffing levels.

☐ 2. Below typical

☐ 3.Typical

- *Generally* able to plan a logical sequence of events.
- *Usually* able to revise plans to take account of changed circumstances, *but* if a major change is required he/she has some difficulty.
- *Generally* confident in making decisions, even under time pressure.
- *Sometimes* has difficulty planning work priorities, resources, staffing levels.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- *Consistently* able to plan a logical sequence of events.
- *Always* revises plans to take account of changed circumstances. Has no problems/difficulties even when there are major changes.
- *Very confident* in making decisions – even under time pressure.
- *Always* plans work priorities, resources and staffing levels without hesitation and with confidence.

12. Establish and maintain effective relationships with others and propagate team working

Has well developed interpersonal skills. Is able to establish effective working relationships with antagonistic individuals. Uses his/her team working skills to encourage co-operation between team members, overcome team conflict and remain impartial. Place a cross *in the appropriate box.*

☐ Don't know

☐ 1. Poor

- *Avoids* interaction with others, eg, establishing rapport with new contacts.
- *Avoids* establishing relationships with antagonistic people.
- *Fails* to encourage co-operation between team members, eg, does not try to reduce tensions between people.
- *Always gets* emotionally involved.

☐ 2. Below typical

☐ 3.Typical

- *Generally* has good interpersonal skills, eg, is able to establish rapport with new contacts.
- *Majority of the occasions* he/she is able to establish relationships with antagonistic people – with a few exceptions.
- *Generally* encourages co-operation between team members.
- *Usually* does not get emotionally involved.

☐ 4. Generally better than the typical Worker/ Contractor

☐ 5. Better than most

☐ 6. Outstanding

- Has *exceptional* interpersonal skills, eg, is able to establish rapport with new contacts regardless of the circumstances.
- *Always* ensures he/she establishes relationships with antagonistic people, eg, winning them round with logical arguments to persuade them.
- *Always* encourages co-operation between team members, eg, by helping to overcome team conflicts.
- *Always remains* impartial and *never* gets emotionally involved.

Leave

Please rate the sickness record of the track worker/contractor:

1. ☐ One of the worst records I have known
2. ☐ Slightly worse than typical Track Worker/ Contractor
3. ☐ Typical of most Track Worker/ Contractor
4. ☐ Better than the typical Track Worker/ Contractor
5. ☐ One of the best records I have known

Punctuality

Please rate the punctuality record of the track worker/contractor:

1. ☐ One of the worst records I have known
2. ☐ Slightly worse than the typical Track Worker/ Contractor
3. ☐ Typical of most Track Worker/ Contractor
4. ☐ Better than the typical Track Worker/ Contractor
5. ☐ One of the best records I have known

Other comments?

Safety Record

How many safety issues/incidents has the track worker/contractor been involved in for which he/she was responsible :

1. ☐ One of the worst records I have known
2. ☐ Slightly worse than typical Track Worker/ Contractor
3. ☐ Typical of most Track Worker/ Contractor
4. ☐ Better than the typical Track Worker/ Contractor
5. ☐ One of the best records I have known

Degree of Confidence in Your Ratings of the Track Worker/Contractor:

☐ not all confident ☐ fairly unconfident ☐ averagely confident ☐ fairly confident ☐ extremely confident

Thank you for your help

Printed and published by the Health and Safety Executive
C1.10 09/04

MAIL ORDER
HSE priced and free
publications are
available from:
HSE Books
PO Box 1999
Sudbury
Suffolk CO10 2WA
Tel: 01787 881165
Fax: 01787 313995
Website: www.hsebooks.co.uk

RETAIL
HSE priced publications
are available from booksellers

HEALTH AND SAFETY INFORMATION
HSE Infoline
Tel: 08701 545500
Fax: 02920 859260
e-mail: hseinformationservices@natbrit.com
or write to:
HSE Information Services
Caerphilly Business Park
Caerphilly CF83 3GG

HSE website: www.hse.gov.uk

RR 271

£20.00

ISBN 0-7176-2901-5

9 780717 629015