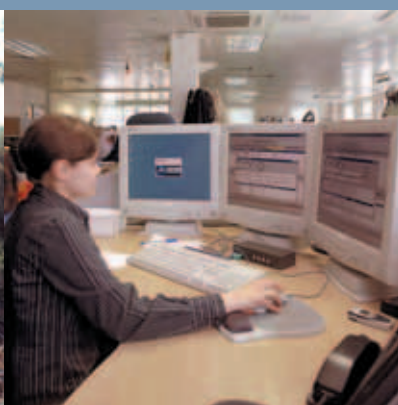


# DEVELOPING AND MAINTAINING STAFF COMPETENCE

Railway Safety Publication 1



OFFICE OF RAIL REGULATION

# **DEVELOPING AND MAINTAINING STAFF COMPETENCE**



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The guide is intended to help people who may be affected by the Regulations to understand what the Regulations require. It is a simple explanation of the main provisions of the Regulations.

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# FOREWORD

I am pleased to introduce this revised version of *Developing and Maintaining Staff Competence*. It has been necessary to revise the document to take into account the implementation of The Railways and Other Guided Transport Systems (Safety) Regulations 2006 and the revoking of The Railways (Safety Critical Work) Regulations 1994. However, the actual principles and factors to be considered when developing a competence management system have not changed since the first edition.

This guidance is applicable to everyone whose work and decisions can affect health and safety. The guidance was developed by Her Majesty's Railway Inspectorate (HMRI) that has been offering advice on good practice to the railway industry ever since it was formed in 1840. It describes the principles and factors that should be considered in any competence management system. The high-level principles with associated underlying factors provide information, explanation and examples. The examples are taken mainly from the railway industry.

The first edition of this guidance<sup>1</sup> was produced with the assistance of a subcommittee of the Health and Safety Commission's Railway Industry Advisory Committee. Members of the working group included representation and expertise from all sectors of the railway industry. The membership of this group is provided overleaf. I would like to thank the members of this group for their invaluable assistance and especially the technical author, Dr Dudley Hoddinott, who has also carried out this revision.

I commend this guidance to you. All companies should periodically review their arrangements regarding the maintenance of the competence of their staff and to implement improvements to ensure that the risks to railways and other guided transport systems are properly controlled.



Linda Williams  
HM Chief Inspector of Railways  
Office of Rail Regulation

## ACKNOWLEDGEMENTS

The guidance *Developing and Maintaining Staff Competence*<sup>1</sup>, first published by the Health and Safety Executive in 2002, was developed by a working group of the Health and Safety Commission's Railway Industry Advisory Committee. The following were members of this working group for some, or all of the meetings (with their employer at the time of their main involvement in the working group):

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We would like to thank the individuals and organisations for their contribution.

# INTRODUCTION

- 1 This guidance is primarily aimed at those who are responsible for managing and assuring the competence of individuals and teams in the railway and other guided transport systems industry, and whose work may have an impact on operational safety and on occupational health and safety. However, anyone with an interest in competence management will also find useful advice in this guidance. Directors and senior managers responsible for the overall policy of the company need to be aware of the general objectives and benefits that may result from the use of this guidance. Managers responsible for the maintenance and improvement of an existing competence management system, those responsible for implementing a system and those operating and assuring the quality of systems will need to understand more of the detail of this guidance.
- 2 The companies in the railway and other guided transport systems industry, that includes light rail and tram systems, and also their contractors and subcontractors, should read this guidance. The guidance will be relevant to organisations carrying out training, development and competence assessment; it will also be of interest to trade unions, employee representatives, health and safety professionals, designers and other service providers.
- 3 The guidance is relevant to organisations of every size that require their staff to be competent. The number of roles involved in a competence management system may seem to be more applicable to larger organisations. However, this guidance is as relevant to small organisations where each person involved in the competence management system is likely to carry out several roles. The effort and cost of implementation is likely to depend on the size of the organisation and the risks involved.

## BACKGROUND

- 4 For many years there has been a generally improving trend in health and safety performance both at work and in terms of public safety. However, people at work and the general public continue to demand further improvements. This improvement has been reinforced by legislation, such as The Health and Safety at Work etc Act 1974<sup>2</sup>. Historically there have been huge improvements through technology and significant improvements in safety management processes and procedures. More recently attention has been focused on the benefits to be obtained from improvements in understanding and managing human factors.
- 5 The Health and Safety Executive (HSE) publication *Successful Health and Safety Management*<sup>3</sup> describes the principles and management practice that provide a framework for effective health and safety management. Competence of individuals is an important component in this framework. Guidance on the effect of human factors and how to tackle them is given in *Reducing Error and Influencing Behaviour*<sup>4</sup>. Competence and fitness are required by The Railways and Other Guided Transport Systems (Safety) Regulations 2006<sup>5</sup> (ROGS Regulations) in Part 4 on safety critical work. Legislation for other industrial sectors has also recognised the importance of competence.



- 6 This guidance provides information that is applicable more widely than just the railway and other guided transport systems industry. While some of the terms and examples have a railway bias, the text has been written so as to make it accessible to a wide range of industries, businesses and organisations. The meanings of specific terms used in the guidance are given in the glossary (Appendix 2).

## COMPETENCE

- 7 Competence in this guidance means the ability to undertake responsibilities and to perform activities to a recognised standard on a regular basis. Competence is a combination of practical and thinking skills, experience and knowledge, and may include a willingness to undertake work activities in accordance with agreed standards, rules and procedures. Competence depends on the context and the environment in which the activity is performed, and also on the working culture of the organisation. In the work environment the standard of competence is the standard of work expected to satisfy a number of requirements, including business objectives as well as health and safety requirements. The context, environment and culture are particularly relevant during a person's development programme before their first competence assessment, and when seeking to address any subsequent sub-standard performance. Developing competence will not in itself guarantee safety, but it will improve the predictability of good performance.
- 8 Competence plays a very important role in controlling health and safety risks on the operational railway and other guided transport systems. Risk control systems rely on a complex mix of hardware (eg railway signals), software (eg railway rules and regulations), human factors and safety management systems. In this document we use the terms normal operations, degraded operations and emergencies to describe the types of operation (see Appendix 2). The role of people in controlling risks is central to this guidance. While the role of people is very important in normal operations, it is vital in degraded operations and emergencies when it is the ability of the individual to return the system to normal operation that is so important. It is only the competent individual who will be able to undertake such recovery, and this is why competent operation is so important. Where competent performance is not maintained accidents, incidents and injuries may result.
- 9 The purpose of a competence management system (CMS) is to control in a logical and integrated manner a cycle of activities within the company or organisation that will assure and further develop competent performance in work. The aim is to ensure that individuals are clear about the performance that is expected of them, that they have received appropriate training, development and assessment, and that they maintain or improve their competence over time. Training and development seeks to create a level of competence for the individual or team, sufficient to allow individuals or teams to undertake the operation at a basic level. Initially this will be under direct supervision, which will become less direct. Over time as knowledge and practical experience grows, operations can be carried out at a more complex level. Such an approach will also increase the confidence of the individual or team to deliver competent performance, while

making them aware of their limitations. Assessment (and reassessment) is how judgements are made that the inputs (ie training, development and experience) have been understood sufficiently to deliver outputs (ie in terms of competent performance and safe operation). Competence can be seen as a continuum with people at various stages along it such as novice, not yet competent, competent, proficient and expert.

- 10 The approach to assuring an effective and consistent standard of competence in individuals and teams is a progressive one, and can be shown diagrammatically as shown in Figure 1.

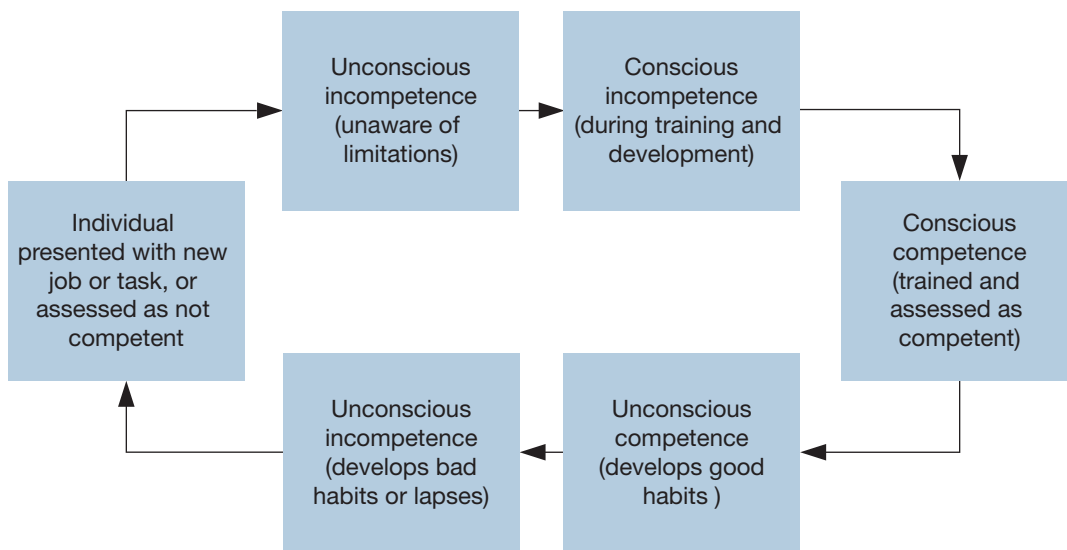


Figure 1: Competency stages of the individual

- 11 When people begin a new task (or are progressing to a higher level), they will be unaware (at least to an extent) of what they can and cannot do (a state we can term 'unconscious incompetence'), see the top left box of Figure 1. Through training and development activities, they will quickly move to knowing what they do not know ('conscious incompetence'). Once they have learned to do the task, they will initially need to think about it consciously in order to perform to an acceptable level ('conscious competence'). For more complex tasks, this state often demands a high level of focus and concentration. As people work at the tasks, further work becomes second nature, and even those matters encountered rarely become well practised. In effect, people reach a level of almost automatic performance, where the only real calls on their underpinning knowledge and experience occur when they have to deal with the more extreme degraded operations and emergencies (which we can call 'unconscious competence'). The main danger is that without realising it people can regress and become 'unconsciously incompetent' again, as shown in the bottom left box of Figure 1. It is to avoid this that monitoring and reassessment of performance is undertaken at the individual level, and verification, audit and review takes place at the system level.

- 12** The principles and associated factors that make up the competence management system outlined in this guidance are applicable to all staff and managers whose work activities may have an impact on health and safety. The guidance can be applied to work at all levels of the organisation. This is perhaps obvious with respect to those who are directly involved in day-to-day operational activities but it also applies to those who manage the competence management system, and to those managers whose main contribution to health and safety is decision making about financial and commercial matters. All can have an impact through the competence (or otherwise) of their performance on operational and occupational safety of the workforce, the public and themselves. All need to have their competence managed.

## **FITNESS**

- 13** Fitness is an important issue for companies as they have responsibility for the fitness of staff and contractors. Companies require their staff and contractors to have a degree of medical and physical fitness so that their work is performed to a satisfactory standard. Fitness is a legal requirement of the ROGS Regulations<sup>5</sup> and other legislation. Appendix 1 describes fitness in terms of physical, mental and medical fitness, and explains how it should be considered. Each company has responsibility for ensuring that their fitness standards are suitable for the risks involved. The company should ensure that the doctor responsible for medical fitness is professionally competent. There should be systems in place to ensure that staff remain fit and any change in their fitness status is identified. For further details see Appendix 1.

## **PRINCIPLES AND FACTORS**

- 14** In this guidance a principle is defined as a key safety objective to be achieved as part of a good competence management system. Factors related to each principle are defined as matters that should be considered and, where appropriate, acted upon when reviewing or implementing the principles.

## **THE OBJECTIVES OF THIS GUIDANCE**

- 15** This guidance:
- describes the principles and factors that should be considered in any competence management system;
  - explains how to ensure that the competence of individuals and teams satisfy the requirements of existing legislation;
  - can be used for improving existing systems or for setting up and implementing new competence management systems (see paragraphs 28 and 29);
  - includes guidance and responsibilities relating to medical and physical fitness (Appendix 1);
  - provides information on the terms used (Appendix 2) and organisations referred to in the text (Appendix 3); and
  - will assist in improving health and safety in the company and produce business benefits.

# LEGISLATIVE BACKGROUND

## AIM

- 16 This guidance is primarily aimed at the development of competence of individuals and teams within the railway and other guided transport systems industry. Much of what follows is equally applicable to other industrial sectors, but there are legal requirements that are specific to railways and other guided transport systems. This section provides an overall legal background to the guidance.

## LEGISLATION

- 17 The Health and Safety at Work etc Act 1974<sup>2</sup> (HSW Act) places general duties on employers and the self-employed to ensure that employees and others who may be affected by the work of their undertaking, are not, so far as is reasonably practicable, exposed to risks to their health and safety. In particular this includes the provision of safe systems of work, supervision and training.
- 18 The Management of Health and Safety at Work Regulations 1999<sup>6</sup> (MHSW Regulations) require employers to undertake a suitable and sufficient assessment of the risk that their activities present to their employees and others, including contractors and the public. Measures developed from such risk assessment need to encompass training, knowledge and experience. Employers should also appoint a 'competent person' (as defined in the MHSW Regulations) to help them comply with the statutory provisions.
- 19 There is a requirement under The Railways and Other Guided Transport Systems (Safety) Regulations 2006<sup>5</sup> (ROGS Regulations) for transport operators to make a suitable and sufficient assessment of the risks to the safety of any persons to ensure the safe operation of the transport system. There is also a requirement under these regulations for all controllers of safety critical work to ensure that persons carrying out safety critical work have been assessed as being competent and fit. There should be an accurate and up-to-date written record of a person's competence and fitness. This record should be available for inspection on reasonable request. Also, there should be arrangements in place for monitoring the competence and fitness of individuals.
- 20 There is a legal duty on employers to consult safety representatives appointed by a recognised trade union (under the Safety Representatives and Safety Committees Regulations 1977), and a commitment under the Health and Safety (Consultation with Employees) Regulations 1996 for employers to consult employees who are not represented by a trade union safety representative, on matters relevant to their health and safety.

## SELF-EMPLOYED WORKERS

- 21** Although only the courts can give an authoritative interpretation of law, in considering the application of this guidance to people working under another's direction, the following should be considered.
- 22** If people working under the control and direction of others are treated as self-employed for tax and national insurance purposes they should nevertheless be treated as their employees for health and safety purposes. It may therefore be necessary to take appropriate action to protect them. If any doubt exists about who is responsible for the health and safety of a worker this should be clarified and included in the terms of a contract. There remains a legal duty under section 3 of the HSW Act<sup>2</sup> towards others, and such legal duties cannot be passed on by means of a contract. If such workers are employed on the basis that they are responsible for their own health and safety, legal advice should be sought.

## CONTRACTORS AND SUBCONTRACTORS

- 23** The client company remains responsible for operational safety and occupational health and safety irrespective of where its resources come from, either through its own staff, contract, subcontract or agency staff or the self-employed under sections 2 and 3 of the HSW Act<sup>2</sup>. The company supplying labour, or the self-employed, also have a duty under the HSW Act<sup>2</sup>. All categories of worker must be competent to control the relevant risks.
- 24** There are two options for client companies employing contract and subcontract staff, agency staff and the self-employed. The options are, either:
- (i) include such staff in a competence management system that uses the same or equivalent standards as the client company uses. The client company should be able to verify and audit the competence management system and keep copies of certification showing individuals have been assessed as competent; or
  - (ii) regard these people as the client company's own staff and take them into the client company's own competence management system, with periodical reassessments, training and keeping suitable records.
- 25** The contract between the client company and the contractor, the agency or the self-employed may include arrangements defining who is responsible for competence management. In all cases, however, whichever competence management system is used, it should be verified by the client company, as the client company must take ultimate responsibility for the competence of all its workers.

# OUTLINE OF THIS GUIDANCE

## COMPETENCE MANAGEMENT SYSTEM CYCLE

26 Competence management seeks to integrate in a logical process a number of related management activities. Like most management systems it involves designing, planning, implementing, monitoring and reviewing. In this guidance we show that competence management can be viewed as a cycle defined by 15 principles linked in five phases, as shown in Figure 2. This cyclic process should lead to continued improvement in competence.

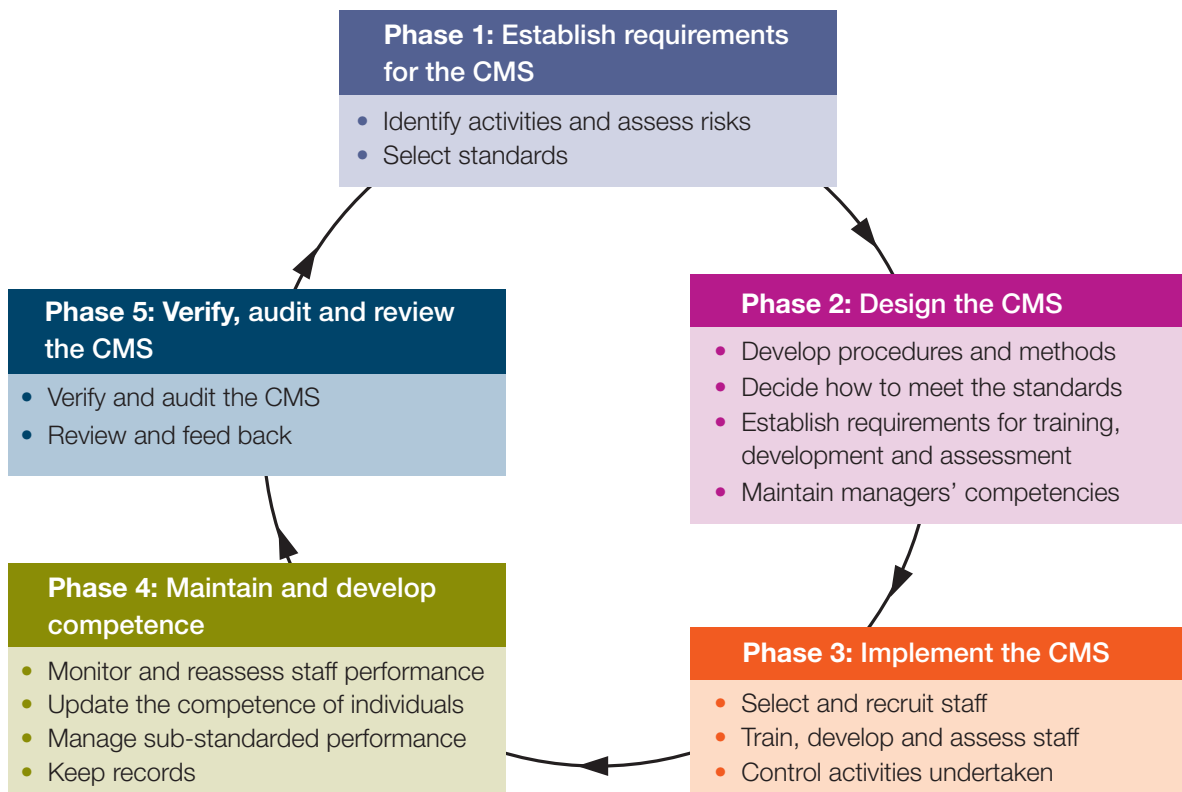


Figure 2: Competence management system cycle

- 27** While people may be currently competent, they do not necessarily retain a satisfactory level of competence over time. This is true for the competence management activities as well as the activities carried out by the staff. The level and nature of the competence of staff in a company will be continually changing. The purpose of the competence management system outlined in this guidance is to provide checks and guidance to help companies meet their overriding duty to provide adequate resources with a sufficient level of competence to ensure health and safety so far as is reasonably practicable. Good companies will also ensure that competence management activities focus on further development of staff as part of this continued professional development.
- 28** To compare an existing competence management system with the principles outlined in this guidance it may be best to start using the guidance from Principle 15, Review and Feed Back. Risk assessments relating to the competence standards and the safety performance of the company or organisation should be reviewed along with whether recommendations for change from verification and audit have been implemented. This should be followed by checking the competence management system against the requirements of Principle 1, Identify Activities and Assess Risks. The assessment of the risks from all the activities undertaken by the company or organisation, including the competence management aspects, is vitally important.
- 29** When setting up a new competence management system the starting point should be Phase 1 to establish the requirements for the system. Principle 1 requires the identification of the activities undertaken by the company or organisation and the assessment of the associated risks. This is the foundation for a competence management system to reduce risks to health and safety and continually improve. This will be followed by Principle 2 for the selection or development of standards to control risks. Moving around the cycle shown in Figure 2, the next action is to design the system, followed by implementation and then to maintain competence. The audit and review provide the results that can be used to update the requirements for the system, and return to the starting point.

## HOW TO USE THIS GUIDANCE

- 30** In this guidance each principle defines a key safety objective to be achieved as part of an integrated competence management system. Each principle is provided with an overview summary. Each principle has a number of factors attached to it that should be considered and, where appropriate, acted upon when reviewing or implementing the principles. The overview and factor headings should allow the reader to quickly assess the key elements. The factors given are not intended to be an exhaustive list, nor are they listed in a precise order of priority, but they do follow a logical order. They give the most important factors for health and safety. It is possible that not all of the factors will be relevant to all companies or organisations in all circumstances.
- 31** The text that follows each factor describes what should be done to implement the factor, and provides some explanation on why it should be carried out. Additional information is provided to help with the implementation of the factor. The examples, to help understand and implement the factors, are taken mainly from the railway industry but similar instances will occur in other industries.
- 32** Each principle, attached factors and associated text have been presented in as concise and self-contained a way as possible. Care should be taken to ensure the requirements of earlier phases have been adequately addressed before moving on to the next phase. Although the focus is on safety critical activities, the principles can equally well be applied to improving business-related risks such as customer service and activities that have an impact on performance.

### SUMMARY OF COMPETENCE MANAGEMENT SYSTEM

- 33** The competence management system described in this guidance consists of 15 principles linked under 5 phases, as shown in Figure 2. A summary of the system describing the principles within each phase is given below.



## Phase 1: Establish requirements for the CMS

The requirements for the system are established in Phase 1, starting with the identification of activities that may affect operational safety and occupational health and safety (Principle 1). The risk assessment, with control measures, identifies those activities where the competence of people to control risks is important. This leads to defining and selecting the competence standards for individuals to enable them to control risks consistently (Principle 2).

1

## Phase 2: Design the CMS

The procedures, methods and work instructions for operating the system are developed to achieve consistency (Principle 3). How each competence standard is met and assessed is then established (Principle 4). The extent of the training, development and assessment requirements is established (Principle 5). The competencies and responsibilities of those managing and operating the system are established (Principle 6).

2

## Phase 3: Implement the CMS

Staff and recruits are selected and recruited (Principle 7) against standards selected previously, and trained, developed and assessed (Principle 8) against the competence standards and methods already selected (Principles 2 and 4). Control processes should be established to ensure that staff and contractors only undertake work for which they are competent (Principle 9).

3

## Phase 4: Maintain and develop competence

Monitoring and reassessment of the staff ensures that performance is being consistently maintained (Principle 10), and that the competence of individuals is updated (Principle 11) in response to relevant changes including changes in legislation, standards and equipment. In particular, systems are required to identify sub-standard performance and restore the competence of individuals (Principle 12). Records must be maintained and made available when requested (Principle 13).

4

## Phase 5: Verify, audit and review the CMS

The verification and audit of the system (Principle 14) checks on the competence assessments and the assessment process. Company management should review the whole system and feed back, using the information from verification and audit (Principle 15), to update the requirements for the competence management system which returns the system to phases 1 and 2, leading to changes or modifications to system design.

5

## DEVELOPING AND MAINTAINING THE COMPETENCE OF INDIVIDUALS

- 34** The flow chart in Figure 3 illustrates in diagrammatic form phases 3 and 4, and can be used to assist in the process of developing and maintaining the competence of individuals. The flow chart consists of a number of tasks, shown as rectangles, and decision boxes, shown as diamonds, with the corresponding principles alongside.
- **RECRUITMENT AND SELECTION**  
The candidates for recruitment or for selection to carry out new activities are either selected as suitable for the activity, or rejected as not being suitable for the activity (Principle 7).
  - **TRAINING, DEVELOPMENT AND ASSESSMENT**  
The staff and recruits are trained and developed and then submitted for assessment (Principle 8). Some will be assessed as competent. Others will not yet be competent; some of these will be suitable for more training and development, but others may not be suitable for the activity (Principle 8).
  - **MAINTAINING AND DEVELOPING COMPETENCE**  
Those who have been assessed as competent will be monitored to ensure that their competence is being maintained. It is also beneficial to aim assessment activities towards continuous improvement and further development of staff skills and knowledge (Principle 10). Staff continue working, with formal and informal monitoring for most of the time they are carrying out the activity. The monitoring may detect that a person's competence is not being maintained, as shown by sub-standard performance. If the person is suitable for a development programme to help restore competence (Principle 12), the programme can be implemented and the person reassessed (Principle 10). In some cases the person may not be suitable for a development programme, and consequently is not suitable to continue to carry out the activity (Principle 12).
  - **REASSESSMENT**  
The staff who continue to be competent will be periodically reassessed (Principle 10). Some staff may be reassessed, as required by their line manager. If the reassessment is successful, they will continue carrying out the activity, and monitoring continues (Principle 10) until the next reassessment. The reassessment may identify that competence is not being maintained, as shown by sub-standard performance, then the decision needs to be made about whether the person is suitable for a development programme (Principle 12) to help restore competence, followed by reassessment. In some cases the person may not be suitable for a development programme, and consequently is not suitable to continue to carry out the activity (Principle 12).
- 35** The above is a simplified version of how the competence management system can be applied to an individual. This process should only be used in conjunction with all the principles in this guidance listed in Figure 4. In particular, Principle 11 should be used for updating the competence of individuals.

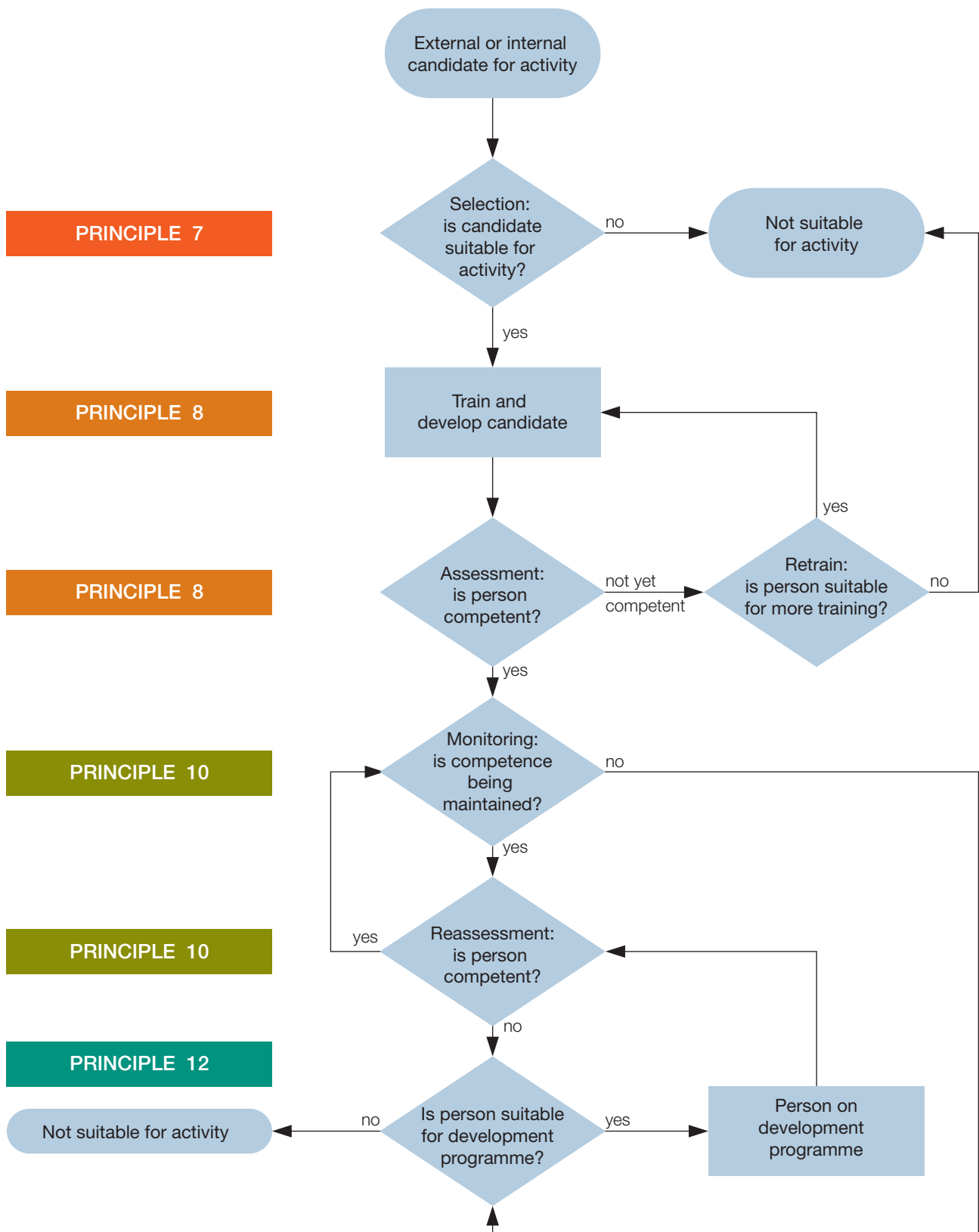


Figure 3: Developing and maintaining the competence of individuals



Figure 4. The competence management system



## PHASE ONE: Establish requirements for the CMS

### Principle 1: Identify activities and assess risks

#### PRINCIPLE

Identify the work activities and assess the associated risks to determine those that have the potential to affect the safe operation of the railway or other guided transport system or that affect occupational health and safety.

#### OVERVIEW

If you are to control risks, you need to know what people do, the risks associated with these activities and the nature of the risk control measures in place. Identify all the activities that may affect operational safety and occupational health and safety. Identify the hazards associated with these activities and the risks in terms of frequency of occurrence and severity of consequence. Assess the risks under all conditions to determine those that have the potential to affect operational safety or occupational health and safety. Identify the control measures, including those involving equipment, processes and procedures which are needed to eliminate or reduce the identified risks, and consider the probability of the failure of these controls and how this may impact on these risks. Identify the activities that individuals must perform competently and consistently for risk control measures to be effective. Consider the impact from changes in technology and the effect of human factors on safety.

#### FACTORS

The factors for consideration include:

**(a) Identification of the activities that affect operational safety and occupational health and safety, and the activities that are critical for controlling risks.**

Identify the work activities, the hazards associated with these activities and the potential to introduce significant risk to operational safety or to the health and safety of people as a result of these activities. It is likely that some analysis of activities will already have been undertaken as part of your approach to complying with the Management of Health and Safety at Work Regulations 1999<sup>6</sup> (MHSW Regulations). The MHSW Regulations require employers to make a suitable and sufficient risk assessment that must be revised and brought up to date on a regular basis. Therefore the identification of activities and associated hazards and risks should already be an ongoing process within all companies.

A system to manage competence is a key part of the approach to risk control and needs to be applied to all activities that affect health and safety. This consideration should include activities and decisions made by company management that may affect health and safety (eg directly, by the day-to-day management of front-line staff, and indirectly by management decisions, such as decisions on investment or renewal).

Activities that are defined as safety critical according to The Railways and Other Guided Transport Systems (Safety) Regulations 2006<sup>5</sup> (ROGS Regulations) must be identified, as there are extra requirements associated with these activities.

**(b) Identify hazards associated with activities in normal and degraded operations and emergencies.**

Identify the hazards associated with the activities already described. This should extend to activities undertaken in normal and degraded operations and emergencies (see Appendix 2 for meanings). A wide range of hazards are encountered across industry, and many of these are well understood and their associated risks controlled. However, as the industry changes, the hazards experienced by a company may also change.

**(c) Determine the risks that need to be controlled under all operating conditions.**

Determine the risks under normal and degraded operations and emergencies. It is a requirement of the ROGS Regulations<sup>5</sup> that every transport operator should make an assessment of the risks to the safety of persons and implement measures to ensure the safe operation of the transport system. The assessment of the risks is crucially important in establishing the requirements for a competent management system.

The frequency of occurrence of normal operations may range from all the time (eg driving a train) to a few occasions each year (eg maintaining specific types of overhead line equipment). The frequency of occurrence may be different for degraded operations and emergencies. However, as the actual frequency of exposure to a particular event reduces, the chances of sub-standard performance when such an event is encountered may increase (as the operator is less practised in coping with the circumstances). It may therefore be harder for the individual to recover the situation and bring the particular operation back under control and therefore the consequences may become more severe. Consider also those activities that only occur in an emergency (eg evacuating or escaping from a train) as these need special attention.

As well as the activities themselves, the risks associated with the implementation of a new or revised competence management system should be considered once the components of the system have been designed.

**(d) Implement control measures to reduce significant risks.**

Risks will normally be controlled through a number of methods, some of which will overlap, giving added protection. Many of these controls will be well understood. These controls should be documented so the links between controls are clear. The controls which rely on competent performance should be highlighted.

**(e) Identify where and to what extent the risk controls rely on competence of people to control remaining risks.**

Highlight the activities that rely on the competence of people to reduce the remaining risks to as low as reasonably practicable. A wide range of risk control measures may be used which depend for their success on competent people performing activities consistently and within their competencies, in an environment that is stable. The required competencies should be identified so that suitable standards can be selected or developed. Consider in particular where competence is relied on to control risks in degraded operations and emergencies.

**(f) Consider the effect of significant changes of technology, procedures and working practices.**

Review the activities of staff and the competencies required when new technology, procedures or working practices are introduced. Ideally a review should be carried out as part of the procurement process for new equipment. There should be a regular review process to identify all significant additions and changes before implementing new procedures, and as working practices evolve over time.

The review should include examining the effect of adding equipment or activities to determine if the risks have been increased through changing the mix of activities. New equipment may result in some activities being required less frequently, with the possibility that the activities may then be more prone to error (eg new equipment may require less frequent maintenance). The review should also identify any changes in availability and effectiveness of training, development and assessment.

**(g) Consider the effect of human factors on safety.**

Take into account human factors when considering the activities where the role of people is key to controlling the risks. Take account of how satisfactorily people interface with equipment, environment, specific activities and organisational systems. There is a need to take into account a person's capabilities or human factors when considering the activities for that person where the role is key to controlling risks. Practical guidance on how to tackle some of the important human factor issues is given in *Reducing Error and Influencing Behaviour*.<sup>4</sup>



## Principle 2: Select standards

### PRINCIPLE

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

### OVERVIEW

The competence management system is underpinned by a framework of standards that define performance and knowledge requirements. Check that any existing competence standards are still suitable. Additional generic, specific and local standards may need to be developed in the light of activity and risk analysis. Standards should cover normal and degraded operations and emergencies. Standards should be applicable to contractors carrying out defined activities. Standards will be needed also for those operating the competence management system. The competence management system should be compatible with other company policies.

### FACTORS

The factors for consideration include:

**(a) Standards will be needed for all elements of the competence management system.**

Standards will need to be set for the competence management system overall. This will include key performance indicators (KPIs) for individual elements of work. Standards covering selection and recruitment, training and development, as well as system monitoring, verification, audit and review will be needed. Standards will be needed for both operator performance and management performance.

All the standards to be used, whether existing, revised or new standards, should be written clearly. This should produce a consistent assessment of competence irrespective of who carries out the assessment. New or revised standards should be validated by use in a trial, reviewed by a team of people or by a system expert. More detail on standards at different stages is given in the following sections and needs to be considered when setting and reviewing the standards.

**(b) The suitability and scope of existing competence standards.**

Check existing competence standards to ensure that they are adequate to control identified risks, still up to date, relevant for the applications, appropriate for the context in which they are used, and take into account the current working practices of the company. The standards should cover all normal and anticipated degraded operations and emergencies. Also, the standards should cover professional and managerial competencies to control risks.

**c) The adequacy of existing generic competence standards, where they are used, and whether there is a need to develop generic and/or specific standards.**

Generic standards can be applied to a variety of different work situations or equipment. Guidance is likely to be required for the application of a generic standard to a specific activity or piece of equipment. Companies should aim to select standards that take account of nationally recognised versions. Some of the organisations that are associated with the development and assessment of standards are listed in Appendix 3, together with information on each organisation.

Whatever standards are selected, users should ensure that they are fit for their intended purpose and have the necessary depth and breadth. For this, it may be worthwhile to compare standards to the nationally recognised standards covering the same ground. Specific standards (eg referring to a specific type of equipment made by a single manufacturer) may also need to be selected or developed where generic standards are not adequate. If the standards do not cover the competence requirements for degraded operations and emergencies, additional standards should be developed to cover these situations.

National vocational standards will generally require customising to cover the risks from degraded operations and emergencies identified in Principle 1.

**(d) The adequacy of company or local standards in relation to nationally recognised standards.**

Companies may need additional company standards to take into account current working practices that can change over time, or local standards covering local circumstances where existing national standards are insufficient or unsuitable. These standards should be developed at least to a structure and quality similar to those of nationally recognised standards.

**(e) Competence standards for contractors.**

Where contractors and subcontractors are used, the competence standards applied to and used by contractors should be the same as, or equivalent to, the standards required for client company staff. Where necessary these standards for competence and procedures for competence management should be built in at contract procurement and be updated as appropriate as part of the standard contract monitoring process.

**(f) Competence standards for the managers operating the competence management system.**

Standards of competence for managers are crucial to effective operation of the competence management system. Check that current competence standards are available for the activities that the managers operating the competence management system are being asked to undertake. It is vital that those who have a role in managing the system are kept up to date. Otherwise, there is a real danger they will rely on their own experience from when they did similar work and miss changes in working methods and the social context of work.

**(g) Competence standards should be made available to staff and the managers.**

Competence standards should be made available to staff and the managers operating the competence management system in a format that promotes understanding and encourages their use. They should be able to refer to them and understand how they relate to their activities. They can then use them as working checklists to develop and maintain their own competence in conjunction with their managers.

**(h) Clarify that the competence management system is consistent with company policy overall for health and safety management.**

An important final element in establishing the requirements for the competence management system is to ensure that it is compatible with, and fully integrated within, the overall company policy for health and safety management. The integration should lead to efficiencies with a consistent approach to managing competence including integrating training, development, performance reviews, safety management and quality management.

## PHASE TWO: Design the CMS

### Principle 3: Develop procedures and methods

#### PRINCIPLE

**Quality assurance processes, procedures and methods should be developed which are designed to ensure the competence management system consistently achieves the intended results.**

#### OVERVIEW

In order to deliver an effective system, it is important to know what the intended outcomes are. Define the quality assurance processes, procedures, methods, objectives and outcomes for the competence management system. Develop the underpinning procedures, work instructions and methods of communication. Ensure assessors have ongoing support and their approaches are standardised and updated as necessary. Ensure that the assessment records can be verified and audited. Ensure that those who have a role in the system understand their responsibilities. Establish if contractors/consultants are needed. Use available information on good practice.

#### FACTORS

The factors for consideration include:

- (a) **Set the intended results, objectives and processes for the competence management system.**

Establish what is to be achieved in terms of measurable results and objectives for the competence management system and determine the processes required to deliver them. Define the scope of the system including the number of staff to be recruited, trained, developed and assessed. Identify any work that will not be carried out within the company.

- (b) **Develop quality assurance procedures and work instructions to operate the competence management system.**

Write procedures in a clear and unambiguous way to describe how all the tasks needed to operate the competence management system are to be managed. Develop work instructions that expand on the procedures, define the methods to be used and the detail required to ensure consistency. Also write procedures to describe how those assessing competence will be trained and updated to maintain their own competence and how regular verification checks and audit will be carried out. The implementation of the system will need effective planning and sufficient resources.

**(c) Define the roles and responsibilities of the managers operating the competence management system.**

Define the roles and responsibilities of those operating the competence management system, and ensure these are understood by the job holders. Each manager (see the Glossary in Appendix 2) should understand the requirements of the role and take on the associated responsibilities. There should be systems in place for ensuring adequate resources and assuring the competence of the managers operating the competence management system.

The roles of those carrying out the verification of assessors and the competence management system should include supporting the assessors. They should ensure that the assessors are trained and qualified to operate the company's competence management system and to ensure consistency.

**(d) Establish the use of contractors.**

If contractors/consultants are to be used, establish the roles and responsibilities they are to play and the amount of work they will do to operate the competence management system. A contractor can work alongside a manager, be a member of a team of contractors or be one of a number of contractors and employed by the client company. The procedures and methods will need to take into account the mix of staff and contractors.

**(e) Assessment records.**

Ensure that the methods and processes for producing records of assessment are clear, transparent, and provide a clear audit trail (see Principle 13 for more details).

**(f) Need for good communications.**

Good communications are crucial for the effective operation of a competence management system. Procedures are required to ensure effective communication of key information between all those operating the system. Communication channels may need to be established especially for those not directly employed. Channels of communication should be designed to ensure rapid flow of information between all those involved in the system with clear standards for what and when defined information is to be communicated.

**(g) The use of current good practice.**

Ensure that the procedures, work instructions and methods incorporate current good practice. This may be defined by national and professional standards. Benchmarking is a method for identifying and developing good practice, and further guidance can be found in *Health and Safety Benchmarking: Improving Together*<sup>7</sup>.

## Principle 4: Decide how to meet the standards

### PRINCIPLE

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

### OVERVIEW

It is important to select methods of assessment that align with each competence standard and link the requirements of the standard with the context of the work. A range of assessment methods may be required and used together to cover normal and degraded operations and emergencies. Development through practical experience is crucial to attain the required level of competence. The use of simulation exercises and simulators may be necessary for some activities. Any risks arising from the assessment, development or training itself should be controlled.

### FACTORS

The factors for consideration include:

**(a) The appropriate methods for the initial assessment and reassessment of each competence.**

It is important that the assessment methods are related to and relevant to the activity and competence being assessed, ensuring they are linked to the competence standards themselves. The assessment methods should consider the nature, complexity and risk associated with the task, the extent of error detection or supervision and the immediacy of the effect of non-competent performance. The methods will further depend on the standard against which assessment is being made. The methods used for assessment may differ from those used for reassessment. The timing and nature of the working conditions for the assessment need to be considered as these may affect the type of assessment. The assessment methods need to cover the full range of activities being undertaken at that level.

**(b) Competence assessment methods suitable for degraded operations and emergencies.**

The competence assessment methods required for degraded operations, emergencies and other infrequent events may be different from those required for normal operations. Competence in these situations is of great importance, yet these situations may be rarely encountered and the assessments may be difficult, if not impossible, to carry out in normal operations. Questioning the individual should only be used to supplement other assessment methods, as knowledge alone cannot be assumed to infer competence. Therefore alternative techniques may need to be used including group exercises in a classroom, training videos, simulations of incidents, use of simulators, computer based training and variants, practical demonstrations and table top exercises. It is important to

ensure that any simulation is designed to include the human factors pressures of the real activity as closely as possible (e.g. time constraints, communication protocols, procedures). It is also critical that managers who run such simulation exercises are competent to manage the simulation and to assess competence.

**(c) Individual development necessary to attain the required level of competence.**

Development through practical experience is crucial if a person is to move from the completion of a training course to attain the level of competence required to carry out the activity reliably. The development methods need to be flexible and tailored to each individual, as the extent of the development will depend on many factors, including the type of work, the previous experience and ability of the person. A programme of supervised, structured development will provide exposure to different conditions that will be experienced on a regular basis, but may not yet have been encountered (eg overnight working or bad weather). A person may be placed with a skilled team to gain experience in carrying out some activities. Some staff may benefit from a mentor (ie someone who can discuss problems using one-to-one methods). In the latter stages, where on-the-job training may be appropriate, the trainer/supervisor will need to be sure that the work is being carried out correctly and without risk.

**(d) Any operational health and safety risks arising from competence assessment, development and training.**

There may be risks that arise from the assessment, development and training itself. These may have an impact on the safety of operations or increase health and safety risks to: the people providing or receiving the assessment, development and training; others at work; passengers using the transport system; or the general public. These risks should be assessed and methods changed where appropriate, or other actions taken, to minimise any additional risks.

## Principle 5: Establish requirements for training, development and assessment

### PRINCIPLE

Establish the training and development needs and competence assessment requirements of staff, recruits and managers.

### OVERVIEW

In planning the system it is important to be clear on both the inputs (training and development) and the means of measuring the outputs (assessment requirements). Establish the needs for training, development and assessment of staff to meet existing, new or modified standards. Establish the needs to reach the required levels of competence to carry out new activities. New recruits may need considerable training and development, and may need to learn the fundamentals of operational and health and safety risks. Establish what the managers who will operate the competence management system will need in terms of assessment, training and development.

### FACTORS

The factors for consideration include:

- (a) **Establish the training and development needs and the assessment requirements of staff to meet existing, new or modified standards.**

For each competence standard proposed, training and development programmes may need to be determined. Linked to these programmes will be the assessment methods and systems (see Principle 4). Training and assessment needs to be linked, so that staff can progress through the competence development process, increasing the range of activities they are judged as being sufficiently competent to do. As the level of assessed competence increases, the level of direct supervision is likely to reduce.

The amount and nature of training and development input each person receives will depend on the nature of the activities being undertaken and the individual learning and development needs of the person. However, it is likely core training and development programmes can be applied. These programmes may be common across the whole transport sector or more specific to individual companies. Similarly, with the assessment methods, these may be common to the same areas across the transport sector or specific to the company.

In structured training and development activities it is beneficial to develop skills and knowledge in normal operations before progressing to degraded operations, and then emergencies. In this way learning is built upon experience in a logical manner facilitating the assessment of competence at each stage without the assessment being end-loaded.



Training input needs to be followed by assessment against the competence standards in stages to allow people to be judged as sufficiently competent to progress through to the next stage. This will apply equally to existing, new and modified standards. It cannot be assumed that existing staff will be competent to carry out activities to a new or modified standard; all staff will usually require some additional briefing, development and reassessment when they are expected to take on new activities.

**(b) Establish the assessment, training and development needs of existing staff to reach the required levels of competence to carry out new activities.**

Where new activities are to be undertaken a structured development process will be needed. A person's prior experience and learning should be accredited in a consistent and structured way. Staff should be competent to undertake the responsibilities given to them, and where this requires additional training and development this should be provided.

**(c) Establish training and development needs and assessment requirements of recruits to reach the required levels of competence in their initial assessment.**

The training and development needs of recruits will depend on their previous experience and capabilities for improvement. Determine the core activities to be undertaken and the related competencies that all recruits will need, and then establish the extent of any variations to suit individuals and set their training and development needs accordingly. This approach is important at the initial assessment, but may be equally relevant later at reassessment. Some new recruits may need to learn the fundamentals of risks from the operational transport system and related occupational health and safety risks. However, all recruits need some element of assessment.

**(d) Establish the training and development needs and assessment requirements of the managers to operate the competence management system.**

Establish the training and development needs of the managers who operate the competence management system to ensure that their competence and assessments are kept up to date. This is a continuing activity, but becomes more important when a new competence standard is proposed, an existing one is modified, a new activity is undertaken or when the person undertaking the role changes. New activities may include assessment against additional units in an occupational standard, against a standard that the manager has not assessed against before, or carrying out verification or audits. This is particularly relevant when planning to implement a new or revised competence management system.

Determine which managers need to be occupationally competent, which need to be professionally competent to operate the company competence management system and which need to be both; then resource and develop accordingly (see also Principle 6). Training should also be focused on developing the interpersonal skills of assessors (e.g. building relationships, observational and feedback skills, a focus on continuous improvement).

## Principle 6: Maintain managers' competencies

### PRINCIPLE

**Maintain the competence of managers operating the system and ensure that they understand their responsibilities.**

### OVERVIEW

Managers play a key role in developing and maintaining the competence management system. It is important to develop and maintain the competence of managers operating the competence management system. The assessors should be competent to assess others, and they should be monitored through verification activities and periodically reassessed. Managers should understand their responsibilities and be competent communicators. Managers should be aware of the impact of their activities on the system overall, and ensure their own safety competences are maintained.

### FACTORS

The factors for consideration include:

**(a) The occupational and professional competence of managers operating the competence management system.**

Those involved in the operation of the competence management system will need a combination of professional competence (related to their role as assessors, recruiters, etc) and occupational competence (related to their knowledge, skills, etc in the activity they are assessing, recruiting for, etc). Sometimes individuals will have both detailed occupational and professional competences, but trainers, assessors and those involved in development should have sufficient and up-to-date occupational competence and experience, taking into account the company's current working practices. For some, including those in technically complex activities, there are professional standards in terms of qualifications (including membership of recognised professional bodies), relevant experience in the industry and familiarity with the working environment that should be considered. The required competences should be set as part of the standard setting process (see Principle 2).

**(b) The competence of the managers who carry out competence assessment and verification should be trained and periodically reassessed.**

Managers who operate the competence management system should be trained and their competence updated in line with the new or revised competence management system procedures. Assessors who carry out the assessment of staff should themselves be subject to assessment of their competence with a rigour similar to that used to assess staff. Both their ongoing professional competence as assessors (in the operation of the company system) and their occupational competence (related to their

knowledge, skills, etc in the activity they are assessing) should be assessed. The competence of managers operating the competence management system should be monitored through verification activities. This should be supplemented by periods of continued professional development and reassessment. External and 'one-off' qualifications should not be relied upon as an alternative to training and proving competence in the operation of the company competence management system.

**(c) The responsibilities of managers operating the system.**

Management responsibilities for those operating the competence management system should be clearly allocated. Each manager with allocated responsibilities should be competent to carry them out so that the requirements of the system are satisfied and quality is assured. These managers should be able to make effective use of the channels of communication within the competence management system. The company should ensure that the competence of the managers operating the competence management system is maintained through verification and standardisation activities as well as by periodic reassessment. The time intervals between reassessments should be determined by an assessment of the risks involved in the work and any changes made to the competence standards. To maintain standards, some external verification may be beneficial.

**(d) Consider all managers whether directly or indirectly involved in managing the competence management system.**

There are managers (from directors down) who, while having no direct impact on the operation of the competence management system, have an indirect effect through the policies they set, and the way they discharge their own responsibilities. For instance, a financial decision about one area of operations can impact adversely from a health and safety viewpoint on others. All managers should understand the impact and wider health and safety implications of their decisions and be competent to make them. The competence management system outlined in this guidance has not been developed specifically for such senior managers, but it can be applied to their activities, allowing senior managers to understand better the impact of their actions and ensure better control. Where appropriate special validation should be undertaken for those managers as well. This can be part of an annual appraisal. The importance of safety management leadership from the company's own senior managers cannot be underestimated.

# 3

## PHASE THREE: Implement the CMS

### Principle 7: Select and recruit staff

#### PRINCIPLE

Staff should be selected and recruited using suitable selection standards and methods.

#### OVERVIEW

Selecting and recruiting the right staff is crucial if subsequent training, development and assessment is to be effective. Select staff using suitable selection methods and processes, and recruit against agreed standards. A range of assessment tools can be used to indicate the suitability of candidates for their new work.

#### FACTORS

The factors for consideration include:

(a) **The standards to be attained for recruitment and for staff undertaking new activities.**

Ensure consistency and fairness by setting common standards for both new recruits to activities and existing staff selected to undertake new activities. The recruitment standards may indicate the potential for subsequent development or promotion.

(b) **Select and recruit staff using suitable methods.**

Select and recruit staff to carry out new activities using suitable selection methods. Many skills are transferable to a new job, and often knowledge gained from one job can be used in another. The recruitment and selection process should identify the relevant experience, skills and knowledge required for candidates taking on new or similar work. Methods include questionnaires, application forms, worked test examples, and interviews. A structured interview, with a single set of questions, can be used to compare candidates. In some jobs, selection and recruitment can be assisted by the candidate working alongside a member of staff for a day or two. The candidate can experience the work and working environment, while the member of staff can observe the candidate. Assessment centres that specialise in using a range of assessment methods can be used to determine the suitability of an individual candidate or groups of candidates. In some cases the selection methods will indicate that the person is not suitable to carry out the activity (see Figure 3).

**(c) Selection of staff who have carried out other similar work.**

In the case of a person transferring from one company to another to do the same or a similar job or activity, the recruiting company should apply appropriate standards for selection, which will highlight the recruit's ability to carry out all aspects of the new activity. Some of the standards will be core to the task, but others will be core to the company. This set of standards should be complementary to, but not the same as, those used to assess existing staff already doing the activity (eg a newly recruited train driver needs to be selected against the differences between the types of train, as well as the similarities, see Principle 13).

**(d) Use of appropriate methods to test the candidate's aptitude and mental abilities.**

For some tasks, selection may include tests of a candidate's aptitude and mental abilities. This may be relevant where the ability to learn, follow rules or make decisions may be a crucial factor. There are many different methods for this, but whatever assessment tools are chosen, they need to be reliable, validated and consistently applied.

## Principle 8: Train, develop and assess staff

### PRINCIPLE

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

### OVERVIEW

It is important that methods for training, development and assessment are linked to the required competence standards and appropriate to the tasks being undertaken. The training and development of each member of staff and new recruit should take into account their previous experience, skills and knowledge. Their competence should be assessed using suitable methods, taking into account any changes in circumstances and equipment. Those assessed as being not yet competent may need further training and development. Contractors should be trained, developed and assessed to the same standards as staff. Suitable records should be maintained of competence standards achieved.

### FACTORS

The factors for consideration include:

- (a) **Define the activities to be carried out by new recruits or members of staff and the training and development required.**

Both newly recruited staff and existing staff transferring to new positions should have a clear idea of the activities they will be expected to do by referring to the required competence standards. The work activities should be agreed by the person's line manager, so that the new recruit or existing member of staff and the line manager are both fully aware of expectations and any limitations. These activities may be current (ie well known in the company, but new to that individual), new (ie new to the person and the company, such as the operation of a new piece of equipment), or modified (eg modifications to standards and procedures which may be new to the individual or company).

Determine the training and development needs of staff by comparing their experience and abilities (identified during the recruitment and selection process) with the requirements of the agreed activities. This process will also apply to managers operating the competence management system who may also require training, development and assessment before undertaking new activities (eg before carrying out competence assessment against a standard that the manager has not assessed against before, or when carrying out aspects of verification or audit).

**(b) Train and develop each individual to attain the required standards of competence using the defined assessment methods based on the gap between current and intended performance.**

The nature of the training and development each individual receives will be structured to provide the range and depth of experience required to meet that stage of competence assessment. The process should initially develop and assess competence in normal activities before progressing on to degraded operations and emergencies. The extent of training and development will depend on the activities agreed, the standards and the existing experience, skills and knowledge of each person, and will take into account the context in which they are taking place. The system for training and development should be linked to the system to be used for competence assessment.

**(c) Assess competence using defined risk-based methods.**

Assess each individual using methods defined through the risk assessment process. The methods may involve any combination of direct observation, indirectly gained information, unannounced monitoring, incident simulation, use of a simulator, written and verbal tests using open and multi-choice questions. Information may be taken from a personal task or log book. The candidate should understand the methods of assessment before the assessment is made. The competence assessment should be proportional to the hazards and risks involved with the activity (e.g. by the use of adequate testing, pass marks and performance checks) and the verification required.

**(d) Managing those 'not yet competent'.**

A person who is assessed as being 'not yet competent' may need further training and development to gain sufficient practical experience prior to another assessment. Feedback from the assessment should state which activities were not being competently carried out, and indicate what further training and development is required. The person should not undertake activities that they are not yet competent to undertake unless directly supervised or the work is checked by a competent person. A decision should be made on the suitability of the person for further training and development. If agreed, the training and development should be carried out, followed by another assessment. However, there may be some cases where the person is considered not suitable to carry out the activity, and therefore will not undertake further training or development. A decision may be needed on redeployment (see Figure 3).

**(e) Application of the system to contractors and subcontractors.**

Contractors should operate to the same competence standards as permanent staff. The contracting company should ensure that the competence management system they use is aligned to the competence management system of the client company. It should be subjected to verification and audit. Alternatively, contract staff should be assessed within the client company's own assessment and reassessment

programmes. Contractor companies should themselves ensure that any subcontractors they employ also have suitable competence management systems in place.

**(f) The impact of changed circumstances on the system or the use of different equipment.**

Reassessment and additional training and development are likely to be required as part of the introduction of new processes, plant, etc. The changes may be in the working conditions (eg shift working), equipment (eg changing from driving a two-car passenger train to driving a loaded freight train) or seasonal (eg leaves, snow and ice, fog etc).

**(g) Record or certificate of competence.**

A record should be made that the person has been assessed as competent to carry out the activity, referencing the competence standard(s) against which the person was assessed. The name of the assessor(s) and the expiry date of the assessment should be recorded. This record should be kept and maintained by the organisation that carried out the assessment, and be made available to others who may need to see it. In addition, in some cases a document may be issued to the person; this may be in the form of a certificate or licence. This document should list the activity, the standard achieved, the name of the assessor(s) and the expiry date of the assessment. The document should be adequately validated to prevent fraudulent use. For some work an 'authority to work' is issued that may specify a particular location or area; also 'task authorisation' may be used to limit work to specific task(s). These records are important when verifying and auditing (See also Principle 13).



## Principle 9: Control activities undertaken

### PRINCIPLE

**Control processes should be established to ensure that staff and contractors are only asked to undertake work for which they are competent.**

### OVERVIEW

Sometimes people will demonstrate reduced competence or be 'not yet competent' to undertake a task. It is a management job to take action to control this. Staff, including contractors, should know which activities they are currently assessed as being competent to undertake. Control processes should be in place to ensure that staff and contractors only undertake work for which they are competent, and managers should ensure that the controls are enforced. Staff should be able to refuse to undertake work unsupervised for which they are not competent, without detriment to themselves. Staff gaining experience as part of a development programme should be supervised. There should be procedures for staff changing jobs and employers. The competence of a team to undertake activities depends on the mix of competencies of team members. There may be limitations on what the team may do.

### FACTORS

The factors for consideration include:

**(a) Ensure that staff only perform activities they are competent to carry out.**

Staff and their line managers should know which activities staff have been assessed as being currently competent and authorised to undertake. Staff should be made aware of the importance of only carrying out those activities for which they have been assessed as competent, and that this assessment is current. Where appropriate they should have certificates to prove this and be provided with relevant identification.

**(b) The activities that contractors and subcontractors are competent to carry out.**

Contractor companies should know which activities their staff are currently competent and authorised to undertake. Each contractor and their employing company should be clear which activities individuals are competent to undertake. The employing company should not allow staff to work outside these boundaries. Subcontractors should be subject to the same controls.

**(c) When planning and allocating resources for jobs, select only competent members of staff or contractors to undertake the work.**

When planning work and allocating resources for jobs, select only those staff, including those from contractor companies, who are currently competent to carry out the work.

This is relevant to those planning work on a week-to-week basis (eg planning rosters or engineering possessions), and also those tendering for new work. When putting work teams together it is important to know which competencies are needed by all team members and which only by some.

**(d) The restriction on line managers asking their staff and contractors to carry out certain activities.**

The line manager should not ask staff or contractors to carry out work for which they have not been assessed as currently competent. Line managers should be aware of the range of activities that their staff and contractors are currently competent to carry out, and the context and environment in which the work will take place. Control processes should be in place and managers should ensure that the controls are enforced, so that no individual is asked to carry out work they are not currently competent to perform.

**(e) Staff and contractors can refuse to carry out some activities unless supervised.**

Staff and contractors should not be asked by management to carry out an activity for which they have not been assessed as currently competent, and will not be adequately supervised. However, such a request may be made for a number of reasons (eg by mistake, no one else available, no supervisor available to check the work, or in an emergency). In each case the member of staff or contractors should be able to refuse to do the work, if they are not competent to do the activity and the management should accept this as the correct decision, with no detriment to the member of staff or contractors.

**(f) Development activities.**

After training to undertake a new activity, most staff require some practical experience to become sufficiently competent to undertake the task unsupervised. Where staff are not yet competent when undertaking development work, they should be supervised by a currently competent person. The supervisor should control the activities undertaken, check that the activity has either been carried out correctly or ensure that any necessary corrective action is taken, and take overall responsibility for the work.

**(g) Procedures for staff changing jobs or employers, or standing in for others on jobs that involve additional activities.**

When staff change jobs or employers, competence should be assessed/reassessed before staff start their new activities. The recruiting company will want to see evidence of previous competence assessment to ensure itself that a recruit is suitable and competent to carry out their activities. When changing jobs or employers some assessment will be required and some development may be needed before people can work unsupervised. Until all the assessments have been completed a competent supervisor should check the work. The supervisor will take responsibility for each

activity, and ensure that it has been correctly carried out. When a member of staff stands in for someone else (eg who may be sick or on holiday) but does not have the necessary competencies to cover all the work, a currently competent supervisor should check the work and take responsibility for each activity.

**(h) The role of the team, including communication skills within the team.**

Teams are frequently used to carry out a range of activities. The competence make up of a team will depend on the mix of competencies of each member, and how well they work together as a team. The nature of the competence mix of the team may place limitations on what the team may do. The competence of the team leader is vital for ensuring good relationships within the team and that each member of the team communicates effectively. Proper and effective communication is vital both within and between teams.

# 4

## PHASE FOUR: Maintain and develop competence

### Principle 10: Monitor and reassess staff performance

#### PRINCIPLE

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

#### OVERVIEW

The maintenance of competence is dependant on a structured process of monitoring performance and reassessment of competence. Monitoring should be undertaken to check and confirm performance. Newly qualified staff need special monitoring aimed at building competence and confidence. The nature and frequency of planned reassessments depend on many factors. Reassess and develop the competence of staff; specific methods may be required to deal with emergencies and infrequent events. Analysis of staff records can provide information for reassessments. Reassessment following an incident should be undertaken where appropriate. Where a certificate of competence is issued it should bear the expiry date.

#### FACTORS

The factors for consideration include:

**(a) Check competence through planned, informal, remote and unannounced monitoring.**

Monitoring of performance against agreed key assessment criteria lies at the heart of maintaining and developing standards of competence. Between planned reassessments, competent and consistent performance can be checked through monitoring by a supervisor, line manager or mentor. The frequency should relate to the risk involved in carrying out the activity and the interval between planned reassessments. The monitoring may include the following:

- planned monitoring, regularly and previously arranged, as part of a structured scheme;
- informal monitoring by observing operations as part of day-to-day supervision;
- remote monitoring by looking at or listening to records or tapes of activities (eg recordings of communications between a signaller and workers on the track);
- unannounced formal checks, which are undertaken at random intervals (eg using a radar gun to check speed); and
- inspection of personal log books, where they exist.

Where appropriate, a range of monitoring techniques may be required to establish consistent results (eg monitoring train drivers for exceeding the line speed limit) and reliable decisions by those monitoring the activities (eg to consider the person for a development programme, see Figure 3).

**(b) Additional monitoring of newly qualified staff.**

Newly qualified staff will have been assessed as competent. However, because they are relatively inexperienced, a controlled development of their experience (together with post-qualification monitoring) will help to ensure their increasing competence as they experience more of the infrequent events. In this way the confidence of both the newly qualified staff member and line manager is increased. Monitoring should take account of situations of highest risk and, where possible, target infrequent events and emergencies (eg extreme weather conditions).

**(c) Setting the nature and frequency of planned reassessments to address identified risks.**

Monitoring and reassessment ensures competence can be checked in a wider range of situations, allowing for testing in simulated situations and to probe underpinning knowledge and understanding. Monitoring and reassessment test that individuals maintain the necessary level of commitment, skill, experience and knowledge to perform at an acceptable level in the environment in which they are to operate. The frequency of monitoring and reassessment should link to and take account of the risk assessment data. Competence assessments should all have expiry dates. Some form of structured reassessment is needed to do this. There needs to be a balance between the rigour of reassessment (in terms of nature and frequency) against the cost (in terms of time and trouble), against the risks which are being managed through competent performance to determine if this is reasonable. Each scheme may have different needs but the nature and frequency of reassessment will depend upon the following issues:

- risk, in terms of frequency, probability and consequence;
- number, range and complexity of the individual tasks that make up the activities under assessment;
- balance between knowledge and skill-based elements in the competencies;
- the level of concentration required, with an ability to handle distractions;
- time needed to undertake the reassessment;
- probability and frequency of encountering all aspects of the competencies in day-to-day operations;
- difficulties in carrying out reassessments, especially those covering infrequent and emergency events;
- actual detail to be covered in the reassessment; and
- comments from previous assessments.

Organisations should check that their reassessment frequencies are consistent with other organisations having similar equipment and range of activities. However organisations can have different levels of risk compared with organisations having similar range of activities. Therefore organisations should record their rationale for the reassessment frequencies that they have selected.

**(d) A system for planned reassessments.**

Reassessment should be carried out by staff who are competent to undertake the assessment and whose own assessment is current. It is therefore important to have a systematic and planned approach to monitoring and reassessment. The system for recording assessment information and triggering planned reassessments should be operated reliably, normally using either paper (eg on record cards) or computer based records.

**(e) Reassess and develop the competence of staff.**

Staff should not continue to carry out an activity after the expiry date of an assessment until they have been reassessed as competent. Staff should be reassessed after any significant lapse in performance has been identified that may question their competence, and when line managers request an assessment. For some work, where a person has not carried out a specific activity for an agreed period, a reassessment is likely to be needed in the specific activity before it can be undertaken. Before carrying out the reassessment, any modifications to the relevant standards and other requirements should be identified. Those being reassessed should already have been briefed on these changes, and any necessary top-up development carried out (see Figure 3). Refreshing underpinning knowledge contributes to further develop competence and confidence during the reassessment process.

**(f) Reassessment of competence to deal with emergencies and infrequent events.**

Emergencies occur rarely so it is difficult or impossible to monitor the performance of staff in these circumstances. Some degraded operations can occur relatively frequently, some even daily, but usually they are much less frequent. Staff should remain competent to deal with all these events and there should be systematic methods for monitoring and reassessment, with refresher training and development as required. The outputs from Principles 1 to 4 will determine the most appropriate methods. Such methods may include:

- tabletop exercises (eg working through a planned scenario with one or more staff responding to a particular situation);
- simulation of procedures using real equipment (e.g. working on fault-finding on a train and acting as if certain fault conditions existed);
- incident simulations (eg an incident is simulated, with people made up as crash victims for the exercise); and
- use of a simulator to mirror the working environment (eg a signaling centre, or a train-driving simulator).

**(g) Analysis of staff records for accidents, injuries, incidents and other relevant information for planning reassessment.**

Analysis of staff records for accidents, injuries and incidents, as well as information from monitoring an individual's performance, can be used in planning reassessment

programmes. Analysis of this data can highlight an individual's shortfall or a pattern of deteriorating performance against the agreed performance standards. Comments from past assessments may also be useful. This information can be integrated into the reassessment programme to identify particular shortfalls and weaknesses in more detail and can influence the frequency of reassessments.

**(h) Reassessment following an incident.**

If staff or contractors are involved in an incident, they should be reassessed in terms of their core and any more advanced competencies, related to the incident and its control. The extent of this reassessment should be proportionate, but this is a key element in maintaining levels of competence.

**(i) Record and certificate of competence.**

Records of performance monitoring and reassessment should be made, or updated, to indicate that the person has been reassessed as competent to carry out the activity. This record should include the name of the assessor(s) and the expiry date of the assessment. This record should be kept and maintained by the organisation that carried out the assessment, and also be made available to the company employing the member of staff (if different).

In some cases a document may be issued to the person; this may be in the form of a certificate, licence or 'authority to work'. This document should also list the activity, the standard achieved, the name of the assessor(s) and the expiry date of the reassessment. The document should be adequately validated to prevent fraudulent use. All these records are important in allowing the system to be monitored and audited. Rapid communication of these results is important especially if a person has failed an assessment or when monitoring has identified sub-standard performance. (Further details are in Principle 13.)

## Principle 11: Update the competence of individuals

### PRINCIPLE

Update the competence of individuals in response to all relevant changes.

### OVERVIEW

There needs to be an active system to update staff of key changes. Many changes and expected changes could require competencies to be updated, including changes in legislation, mandatory standards, procedures, introduction of new and modified vehicles, plant and equipment, maintenance procedures, and organisational changes. Refresher training, briefing staff (using feedback and open discussions) and updating knowledge will help to maintain and update competence.

### FACTORS

The factors for consideration include:

**(a) Changes in legislation, standards and procedures.**

New legislation, changes in existing legislation and revised guidance on existing legislation, and expected changes, will produce new requirements. New mandatory industry standards and new rules, procedures and ways of working (eg lessons learnt from accident inquiries) will also produce new requirements. Competence standards may need to be altered and the competence of staff updated and assessed; this may require additional training and development. A system to actively monitor these changes and develop briefing and training to explain them is needed.

**(b) Changes due to the introduction of new and modified vehicles, plant and equipment.**

The introduction or planned introduction of new and modified vehicles, plant and equipment (eg a new track maintenance vehicle or upgraded signalling equipment) can change operations, maintenance and the overall workload for staff. Risk assessments will also need to be revised, and the competence of staff may need to be updated and reassessed to more detailed competence standards as a result of such changes or expected changes; this may require additional training and development.

**(c) Changes in operating and maintenance procedures.**

Manufacturers and operators may change or give notice that they will be changing the operating methods and maintenance procedures and standards for vehicles, plant and equipment, especially where defects become known. The maintenance work to be carried out and its frequency may change. Reducing the frequency may require additional work to be carried out each time it is maintained. The competence of staff may need to be updated and assessed; this may require additional training and development.



**(d) Organisational changes.**

Changes in an organisation can affect the work carried out, the responsibilities of staff and the reporting chain for communications and it is vital people are clear about the roles and responsibilities they have. Changes in shift patterns and hours of work may cause fatigue. Changes in contracts and contractor companies can have effects on the work, and on the standards worked to. It is important to analyse the effects of a change before it is allowed to take place and then to monitor the change after implementation. The competence of staff may also need to be updated and assessed requiring additional training or development, preferably before the changes take place.

**(e) Refresher training and coaching.**

Many activities and events occur infrequently, for which refresher training or coaching will help to maintain competence in conjunction with competence assessment. Refresher training should also be seen as an opportunity for repeating key messages. Such learning events may be enhanced by using alternative ways to make the presentation fresh and relevant. When planning refresher training consider:

- Predictable events (eg seasonal refresher training such as for drivers in the autumn, before leaves fall on the rails; or for maintenance staff in the winter for maintaining points heaters).
- Unpredictable events (eg refresher training for emergencies such as for dealing with a suspect package at a station or a classroom exercise for a train derailment).
- Infrequent events (eg for people who have not carried out an activity for a long time such as escape from a train).

These should be covered in a regular, planned manner.

**(f) Briefing, feedback and open discussions between management and staff.**

Regular briefings by management, feedback by staff, and open discussions can assist in maintaining and updating competence (eg regular team meetings or experienced staff giving feedback to newly qualified staff). Briefings need to be planned, but additional briefings may be required after a major accident or incident. There may be instances when it would be best for line managers to brief staff on a one-to-one basis (eg concerning an individual's competence) when a group briefing would be inappropriate. At all briefings management should ensure staff understand the information given to them, and that staff can obtain further clarification as required. The following subjects are likely to be most beneficial in these meetings:

- new and revised operational requirements;
- temporary procedures that take into account degraded operations;
- lessons learned from accidents, incidents, statistical trends and management information systems;
- technical revisions;

- revised procedures;
- modified competence standards; and
- changes to recruitment standards.

**(g) Updating of skills and knowledge.**

Staff, including contractor's staff, must be kept up-to-date about any changes in the requirements for activities that they are involved in. This could involve changes to an individual's knowledge or skills, changes to working methods or procedures, etc. Staff and contractors should be kept up-to-date using a variety of methods, including safety briefings, 'toolbox talks', on-the-job learning, feedback from emergencies, and possibly attendance on courses or lectures. It is also beneficial to ensure that any reassessment event aims to include a continuing professional development element to help individuals further develop their competence and confidence.

## Principle 12: Manage sub-standard performance

### PRINCIPLE

**Identify sub-standard performance and restore competence.**

### OVERVIEW

Where a person is carrying out an activity below an acceptable standard of performance, a clear procedure to manage this sub-standard performance is needed. Systems are required to identify sub-standard performance by individuals and its causes. Company culture, team working or personal reasons may contribute to sub-standard performance. Where performance is sub-standard a programme of work may be required to restore competence, followed by reassessment and revised monitoring. Individuals who are not performing competently may need to be removed from the type of work and certificate(s) of competence temporarily withdrawn while the competence is re-established. As a last resort, redeployment or termination of employment may be necessary.

### FACTORS

The factors for consideration include:

#### (a) Systems to identify sub-standard performance and its causes.

Performance below the required standard of competence results in the health and safety of people being compromised. Such sub-standard performance can be identified through formal and informal monitoring, planned reassessment and from appraisal and performance reviews. The system should establish the nature of any gap that exists between the performance observed and the required standard of performance, and the reasons for any gap. The causes for a gap may be associated with one or more of the following issues:

- lack of confidence or experience (eg first experience of a 'real' infrequent event by a newly qualified member of staff);
- changes in ability (eg skill or knowledge of a situation that has been lost since the last reassessment);
- lack of willingness (eg attitude, approach, motivation, commitment, rule violation);
- internal and external factors (eg changes in shift patterns or weather);
- lack of concentration (eg multiple activities that may reduce the level of concentration);
- poor team working (eg poor supervision of the team or poor communications in the team);
- personal reasons (eg stress, family problems);
- poor relationships at work (eg between staff within the team or railway company);
- change in health and fitness (eg deteriorating eyesight); and
- omissions or deficiencies in a previous assessment.

**(b) Company culture.**

The perceived company culture can contribute to sub-standard performance. An individual may feel pressurised to complete a job by 'cutting corners'. A supervisor may put pressure on an individual to deliver a result. Although the company would not support 'cutting corners' or taking unnecessary risks, staff may react to a perceived pressure to perform and respond inappropriately. In a similar way, those working for contractor companies may perceive and respond to pressure from clients. Therefore care is needed to ensure the expected standards are clearly understood and followed in practice.

**(c) Team working and team competencies.**

In certain areas of work people increasingly work in teams. Where these are multi-skilled teams, staff may have similar competencies, or more likely a range of different but complementary competencies. It is important to identify core competencies that all team members need, such as communication skills, and those that can be held by only some staff. It is also important to monitor both team and individual performance, to detect when any member may be working below standard. This sub-standard performance may affect the overall standard of the team, and will require an appropriate response that may be directed at the whole team or an individual. The competencies that senior management teams require are also important, and need to be considered. However, the measurement of such competencies may be over longer time scales. Sub-standard performance needs to be addressed in such teams too.

**(d) Circumstances that affect performance, including internal and external factors.**

There are many factors that can affect performance. These can include internal factors such as the actions of other staff, contractors and the public and defects in equipment and external factors (eg extreme weather or poor traction conditions). These factors should have been integrated into training and assessment, and staff should be able to overcome such problems. Where there is evidence from performance monitoring that staff are not coping, rebriefing, additional supervision and retraining should be applied. Where patterns emerge there may also be a need for revisions to the competence management system itself (see Principles 14 and 15).

**(e) Identification of personal reasons for sub-standard performance.**

There are numerous personal reasons that could contribute to sub-standard performance. Many of their effects are temporary, with competent performance being restored in a short period of time. They can, however, have a significant effect on performance (eg illness; stress from work; fatigue from long or night shifts; emotional problems, such as splitting up with a partner or divorce; death or illness in the family; financial problems, such as house repossession; and reactions to stressful events, such as witnessing an accident). As with internal and external factors changes in personal circumstances should be monitored so appropriate action can be taken to restore competence.

**(f) Restoring competence.**

Where the types of factor covered in (a) to (e) are known to exist or when a person has been detected as working below standard, a development programme to restore competence should be put in place along with appropriate monitoring. If the sub-standard performance has resulted from personal reasons, which can manifest in a poor attitude or general unwillingness, an interview with a line manager, personnel manager, counsellor or doctor may be required to identify the underlying causes and help resolve the problem.

Where technical factors are involved, longer term changes may be needed coupled with short term interim measures. A decision should be made on the suitability of the person for further training and development, taking into account the situation and the nature of the sub-standard performance. Where the person is considered to be suitable for a development programme, the programme should be implemented followed by a reassessment (see Figure 3).

**(g) Revise the monitoring of the individual or team.**

Where a programme to restore competence has been put in place, monitoring of the individual or team may need to be more frequent for a time. Where relevant, the area of the specific activity where there has been sub-standard performance should be targeted and scrutinised more closely. Planned assessments may need to be more frequent, with informal monitoring (eg day-to-day observation by a supervisor), remote monitoring (eg using recordings of activities), and unannounced checks. Lessons should be learned from this for others who may have similar difficulties, and where necessary changes made to the training and development system (see also Principles 14 and 15).

**(h) Remove the individual from the type of activity.**

Where someone is involved in a specific activity and is found to be working below standard, that person may need to be removed immediately from that workplace (eg by the controller of site safety or by a signaller). However, it may be possible to deal with them by greater supervision. The decision to remove someone will depend on the context (eg internal or external factors, team working or personal reasons) and the level of seriousness (eg a minor problem can be addressed on the spot but a more serious problem may require longer term action, perhaps leading to a reassessment). Any removal is likely to be short term, and lead to some form of development and reassessment.

Where the development programme and reassessment shows that a person is not yet sufficiently competent, or where it was decided that the person is not suitable for a development programme, then that person should be regarded as being no longer suitable for carrying out the activity, and some form of redeployment should be considered. In the final case termination of employment may be necessary (see Figure 3).

**(i) Withdraw certificates of competence.**

Where a person has been removed from the workplace due to working below standard, the company records of competence must be amended to show this. The relevant certificates of competence carried by the worker should be withdrawn. Any relevant 'authority to work' certification allowing individuals to undertake the specific activity should be formally withdrawn as well.

**(j) Alternative or additional measures.**

When sub-standard performance has been identified, alternative or additional measures may need to be taken to improve competence. These can include making changes to procedures or equipment to make them more 'user-friendly' (eg by the use of job cards), or by changing assessment methods to make them more relevant to the area of sub-standard performance (eg replacing written tests with verbal ones where writing skills are not relevant). It is important to consider these alongside the training and assessment options to ensure that the chosen solution is the most effective in the short term (for the person or team involved) and for the longer term needs of the organisation.

## Principle 13: Keep records

### PRINCIPLE

**Maintain adequate records of assessments and make them available when requested.**

### OVERVIEW

Record keeping is vital to keep track of the assessment of competence in order to manage the system. The method of recording the assessments of competence should be reliable. Emergency access to records of competencies should be possible within one hour. Generally, records should be made available, following a request, within 24 hours. The employing company should retain assessment records for twice the reassessment period, along with the records of aptitude and significant events. Log books can record competencies and activities carried out. Records must be made available to those with authorised access. When staff change jobs or employers, some form of assessment will be required.

### FACTORS

The factors for consideration include:

**(a) How to record the assessment of competence.**

The method of recording information on competence should be accurate, reliable, easy to access by authorised persons and open to audit. Records may be held on a computer or be paper based. There should be adequate security to prevent unauthorised changes. Keeping the records on a computer database has many benefits, especially for rapid access from many locations. However, good database management, including regular backups of the database, will be required.

**(b) Who should hold the assessment records.**

The employing company should keep its own assessment records, including the records of staff competencies, assessment, aptitude and significant events for each member of staff. Companies should hold or have access to the record of competencies for each individual, and be able to verify that the information is genuine.

**(c) Who keeps the original certificates.**

In some cases a document may be issued to the person assessed or reassessed as competent. This may be in the form of a certificate or licence. Staff should keep these original certificates and licences safely. They may need to show them to supervisors or people in charge before starting work (eg workers must show their Sentinel Card showing their PTS (Personal Track Safety) competency before going onto Network Rail track). Staff should be allowed to keep certificates etc if they move to another company.

**(d) Records of competencies.**

The record of competencies for each member of staff or contractor should list, as a minimum, the following information:

- each activity that the person has been assessed or reassessed as competent to carry out;
- the standard achieved;
- name of assessor(s); and
- the expiry date of the current certificate or licence of competence.

**(e) Records of assessment.**

The records of competence assessment for each member of staff should include:

- the assessment record, made at the time of the assessment along with any advice or feedback provided for further improvement and development;
- the standard(s) achieved and performance and knowledge criteria met;
- a copy of any certificate or licence issued;
- records that led to the issue of the certificate or licence;
- date(s) of assessment or reassessment;
- name of assessor(s);
- assessment locations and events;
- methods of assessment;
- deficiencies in competence identified and actions taken to rectify them;
- records of training given and any further planned; and
- records of development and any further planned.

**(f) Records of aptitude and significant events.**

Any records of aptitude and mental abilities should include information gathered during the recruitment and selection of individuals (eg results obtained from the use of assessment tools). The records of significant events should include details of any accidents, incidents and other important events (eg signals passed at danger, 'SPADs'). Records should also be kept of reports of sub-standard performance, deficiencies in competence along with any feedback given and actions taken to address sub-standard performance.

**(g) Length of time for retaining records.**

The length of time for retaining records can be difficult to determine. But as a general rule records of competencies and the detailed records of assessment should be kept for a period at least equal to twice the normal period between recertification (ie for a company that normally reassesses a competence every three years, the detailed records of the assessment should be kept for six years). Records of aptitude and significant events should also be retained.



**(h) Who should have access to staff records, including those inside and outside the employing company.**

Such records are personal and only authorised access should be allowed. Those authorised to have access to staff records should include those managing the competence management system, and the line manager and personnel manager for each individual. There also need to be arrangements for the employing company to have access to the records of competencies of the people working for them, or about to start working for them, including contractor staff. These records would be subject to the requirements of Data Protection Act 1998. HM Railway Inspectors (by virtue of Section 20 of the Health and Safety at Work, etc Act 1974<sup>2</sup>) and others with authority should have access to the competence records of relevant staff and contractors.

Where a person is carrying out safety critical work, the record of a person's competence and fitness should be made available for inspection, as required by Regulation 24 of The Railways and Other Guided Transport Systems (Safety) Regulations 2006<sup>5</sup>.

**(i) The time needed to access records.**

Because of the need to be able to access records quickly after an emergency, such as following an accident or incident, it should be possible to make records of competencies available within one hour of any request to confirm the competencies of relevant staff and contractors. Access may be verbal (eg by telephone immediately following an incident), on paper (eg by fax) and by data transfer (eg by a company's internal computer network such as an intranet or by the Internet). Additional records, including records of assessment, aptitude and significant events, should be accessible within 24 hours following a request to provide more detailed information.

**(j) Log book to record competencies and activities.**

A personal log book (used as a record of competencies and activities carried out) can assist in the assessment of some staff. This may be required in some assessment schemes (eg the Institution of Railway Signal Engineers uses a 'licensing log book'). Access may also be necessary to those records when following up events.

**(k) Recruiting staff.**

When someone is recruited new to the industry, records will be created as the recruitment, training and assessment develops. However, when a member of staff moves from one part of a company to another part of the same company (ie changes jobs) or is recruited by another company (ie changes employers) to carry out similar work, the recruiters need to see evidence of previous competence assessment. The recruiters need to assure themselves that the recruit is suitable and competent to carry out their activities. This will mean undertaking some form of assessment. Checking records may speed up the process and being able to check past records of competencies, assessments and significant events will help. So when staff move between companies, they should be allowed to take with them any certificates of competence or licences issued to them (see also Principle 10).

# 5

## PHASE FIVE: Verify, audit and review the CMS

### Principle 14: Verify and audit the CMS

#### PRINCIPLE

Verify and audit the competence management system.

#### OVERVIEW

The integrity of the competence management system will only be maintained if it is regularly checked against the design and improvements made when needed. Some form of verification and audit of the competence management system should be undertaken. Verification should support the assessors, check the quality of the competence assessments at a location and individual level, including the competence of the managers operating the system, and ensure the assessment process remains fit for purpose. Audit should inspect the whole competence management system and judge compliance against the defined quality assurance procedures. Recommendations should be made where appropriate. The frequency of verification checks and audit may be altered if there are a number of changes being made to the system or where performance indicators show deterioration.

#### FACTORS

The factors for consideration include:

(a) **Nature and extent of verification and audit.**

Some form of independent check should be carried out on the competence management system to ensure that the system has been implemented as intended, operated as expected and that activities are being carried out competently. This will involve verification and audit. Verification will support and develop assessors and validate the quality and effectiveness of the assessment aspects of the system to ensure they are being delivered as intended. Audit will assess the efficiency, compliance and reliability of the whole system. The nature, extent and frequency of such verification and audit need to be proportional to the risks which the competence management system controls and the likely failure of such controls.

(b) **Verification of the assessors and the competence management system.**

Verification is concerned with operation and the assessment aspects of the competence management system as well as the assessors. The focus is on the quality, effectiveness and degree of compliance to determine how well the assessments have been carried out, and how closely the assessment process has been followed. These checks look at the use of appropriate competence standards, methods of assessment, and the consistent use of the procedures and work instructions developed for the

competence management system. Normally, internal independent verification is sufficient but with high-risk activities it may be appropriate to supplement it with external verification. Verification can lead to recommendations for improvement. Verification activities should be conducted by individuals who are experienced assessors and are qualified to operate the assessment system. Verification includes the following activities.

Relating to the assessors:

- supporting and providing advice, guidance and updates to assessors;
- ensuring assessors learning needs are identified, addressed and that they remain competent (as individuals and groups, both occupationally and professionally);
- ensuring assessors' judgements are consistent and that they are involved in standardisation events to ensure expectations are communicated and understood;
- checking the application of the competence management system and ensuring events are being planned and conducted in time at a local level by individuals and assessor groups; and
- checking the application and quality of assessment records made by individual assessors.

Relating to the competence management system:

- ensuring the design of the competence management system takes account of human factors and expectations are realistic and achievable;
- liaising with senior management to ensure adequate resources are provided to ensure the competence management system can operate as intended; and
- liaising with external bodies and regulatory authorities to ensure the competence management system is compliant and up to date.

Without this ongoing monitoring of the assessors and the independent checks of the assessment process, it is unlikely that the competence management system will be controlled, effective and applied consistently within the company over time.

**(c) Audit of the competence management system.**

Audit of the competence management system will look at the system as a whole, sampling and checking the performance and compliance over the entire scope of the competence management system against the procedures and the latest regulatory requirements. It may also include sampling and other checks on the up-to-date competencies of the managers operating the system and maintaining auditable records. The audit of the procedures and work instructions should take into account relevant standards. Normally the audit will be carried out by an auditor external to the company, but familiar with systems for competence assessment. External auditors should be qualified as auditors or external verifiers. The audit should check the results and recommendations from the verification, from which further recommendations may result.

**(d) The frequency of verification and audit.**

Verification activities are an integral part of the operation of the competence management system. Additional checks may need to be carried out more frequently when a scheme is new or significant changes are introduced. Additional verification may also be needed where key performance indicators are deteriorating. The frequency may be reduced later, as the system improves and becomes more stable. Auditing will be less frequent than verification. Both are crucial to maintain a cycle of improvement.

**(e) Verification of the work of staff and contractors.**

Verification should also be carried out to ensure that staff and contractor's staff are working competently and only carrying out work for which they are competent. Current working practices should be reviewed. Independent verification can often be undertaken from within the company (eg from another department), however, for high-risk activities (eg faulting and maintenance of point machines) it may be appropriate to seek external verification.

## Principle 15: Review and feed back

### PRINCIPLE

**Review and analyse safety performance data and feed back into the competence management system.**

### OVERVIEW

A key to continual improvement is active system review in line with standards set for the system. The competence management system should be periodically reviewed. The company's safety performance should be reviewed and analysed for trends and compared with industry-wide data. Analysis of injury and incident reports can provide valuable information. Recommendations for change from verification and audit should be reviewed and where accepted these recommendations to improve the competence management system put into practice.

### FACTORS

The factors for consideration include:

**(a) Review the system.**

Carry out periodic reviews to ensure that the competence management system remains effective. The review should assess performance of the overall system against agreed standards, key performance indicators, industry trends and recommendations resulting from verification and audit. A judgement should be made on whether the initial assessment of risks was satisfactory, if the objectives have been achieved and if recommendations made for improvements should be implemented. The review should be carried out by company management applying the standards set for the system (see Principle 4).

**(b) Analysis of company safety performance.**

Analysis of company safety performance data can play an important part in the review. This may include an analysis of a range of key performance indicators which need to be linked to staff competence especially those indicating precursors to incidents (eg speed checks for drivers). The benefit is even greater where data can be analysed and compared with trends and results for the whole industry. A root cause analysis of accidents and incidents may indicate inadequate levels of competence. Available data will vary across the industry, but may include: health and safety incidents; staff turnover; the number of staff identified as working below standard or requiring a development programme; and feedback during reassessment. If company results are below industry norms (eg incident and frequency rates) this may indicate deterioration in the competence of staff and in the operation of the system itself.

**(c) Analysis of national accident, injury and incident reports.**

Industry-wide accident, injury and incident (including near miss) reports provide a valuable benchmark against which to assess any shortcomings in standards, competence of staff, assessment methods and other internal competence-related factors. The opportunity should be taken to learn from accidents, injuries and incidents to develop the system to make it more effective in preventing similar occurrences within the company.

**(d) Feed back the results and make recommendations.**

When the review has been completed the results and recommendations need to be fed back into the relevant phases of the process leading to a systematic and regular updating and improvement of the competence management system. The changes that the review process recommends need to be well managed and communicated to all involved. The aim of the feedback is to ensure all are kept up-to-date and thus improve the competence management system itself and ensure that competencies are being maintained and updated.

**(e) Implementation of the recommendations.**

The managers involved in operating the competence management system should consider any recommendations resulting from verification and audit, and implement those agreed. If a recommendation is not supported, the reasons should be documented for subsequent reference. The introduction of changes should be monitored through verification activities and amendments agreed as required, to ensure recommendations are implemented within acceptable timescales. It will be important to ensure effective communication at all levels of those managing the competence management system and those who are being assessed, so changes are fully understood. The development of such changes of course leads to amendments to Principles 1 and 2 and then so on through the system.

# APPENDIX 1 FITNESS

## Introduction

- 1 An important element in determining overall competence is to establish an individual's fitness. The purpose of establishing their fitness is both to enable work to be carried out competently and to reduce, as far as possible, the risk of pre-existing disability or ill health compromising the safety of the employee, others at work and the public. Regulation 24 of The Railways and Other Guided Transport Systems (Safety) Regulations 2006<sup>5</sup> (ROGS Regulations) states that it is a legal requirement to ensure that staff involved in safety critical activities (as defined in the Regulations) are competent and fit to undertake safety critical activities. Fitness is also required by other legislation, including the Transport and Works Act 1992<sup>8</sup> (T&W Act), which covers those unfit to carry out work because of the effect of drink and drugs.
- 2 This appendix provides an outline of fitness assessments and the roles of those involved in the process.

## What is fitness?

- 3 The term 'fitness' encompasses the interrelated areas of physical, mental and medical fitness.
- 4 Physical fitness standards are required in order that an individual possesses the physical attributes of strength, agility, etc which will enable the activity to be performed competently and safely.
- 5 Mental fitness implies that there are no existing mental conditions that may adversely affect concentration, decision making or behaviour and so compromise competence and safety.
- 6 Medical fitness covers any medical condition that may adversely affect competence and safety at the present time or in the future (eg heart disease, epilepsy, any condition that may affect vision or hearing, or recovery from injury). In the remainder of this appendix, medical fitness will include mental fitness.
- 7 Fitness may be impaired through drink, drugs (including prescribed and over-the-counter medication) and fatigue (eg as a result of working excessive hours, having very short rest periods or doing multiple jobs). Regulation 25 of the ROGS Regulations<sup>5</sup> require that safety critical workers are not so fatigued that health and safety could be significantly affected.

## Company response

- 8 The company has overall responsibility for the fitness of its staff, including contractors, and for employing, or buying in the services of, a doctor to be responsible for assessing medical fitness. This doctor is sometimes referred to as the 'responsible doctor'. The company should ensure that the responsible doctor is professionally competent.
- 9 The company needs to have systems for ensuring that: fitness checks and assessments are carried out satisfactorily and at the correct frequency; individual fitness problems are addressed; and records of physical fitness/unfitness are maintained. When problems arising from the use of drink or drugs, or from fatigue are detected or reported they need to be addressed immediately by the management. Individual members of staff have legal responsibilities in respect of drink and drug use under the T&W Act<sup>8</sup>; however, the Act stresses that the company also has legal responsibilities.
- 10 The company is also responsible for ensuring that the fitness standards are suitable for the risks involved. For this, the company will normally need to seek advice from the responsible doctor.
- 11 In all cases, the company should consider whether the activities can be adapted to enable those with physical or medical limitations to carry out the work to avoid creating unfair barriers to employment (Management of Health and Safety at Work Regulations 1999<sup>6</sup>).

## The responsible doctor

- 12 The responsible doctor must be a registered medical practitioner and should be competent to undertake this role. This doctor will normally need to be a Member of the Faculty of Occupational Medicine, or have an equivalent overseas qualification. The doctor should have sufficient experience of work on railways to enable sound judgements to be made, especially for safety critical work.
- 13 The doctor's specific responsibilities should include the following:
  - (a) to professionally manage the medical assessment system to ensure that assessments are carried out competently and at the correct level;
  - (b) to be responsible for all decisions of medical fitness/unfitness made as a consequence of fitness assessments;
  - (c) to ensure that suitable notification of medical fitness/unfitness is supplied to management at all times; and
  - (d) to ensure that confidential medical records are maintained.



### **Fitness standards**

- 14 Where fitness standards already exist appropriate to the activities to be performed, they should be used if they are suitable. If the standards are not appropriate to the activities to be undertaken, suitable standards should be established based on an assessment of the risks.
- 15 Fitness standards should be reviewed in the light of changes in work activities, advances in scientific knowledge regarding fitness standards, and new knowledge resulting from incident investigations.

### **Assessment of fitness**

- 16 The medical assessment to the appropriate medical standard(s) should be carried out by, or under the supervision of, the responsible doctor. This doctor may delegate all, or part, of the medical assessment to others who they supervise, but the doctor retains the overall responsibility for the process and the result.
- 17 The physical fitness assessment to the fitness standard(s) and decision on fitness/unfitness should be made by a competent person, who may be the responsible doctor or staff properly trained to undertake the assessment.

### **Maintaining fitness**

- 18 It is necessary to ensure that those staff assessed as fit to carry out their duties continue to meet the required standards. Systems must therefore be in place to identify changes in fitness status. These will normally include periodic reassessments, appropriate health surveillance, self reporting of changes to health, the assessment of individuals following periods of sickness absence or injury and a review of sickness absence records. Managers have a responsibility to be vigilant. For many safety critical workers the daily booking-on procedure before starting work helps to ensure they are not unfit to carry out their work because of drink or drugs.

## APPENDIX 2 GLOSSARY

The following terms are used in this guidance:

**Accident** includes any undesirable event which gives rise to ill health and/or physical injury to people, damage to property, plant and products, harm to the environment, or causes production losses, increased liabilities or economic loss.

**Activity** means a work activity carried out by a member of staff or contractor; the person's job would normally be made up of a number of activities. In this guidance an activity can be regarded as the act of carrying out a task. ROGS<sup>5</sup> Regulation 23 defines "safety critical tasks" that are expanded in *Safety Critical Tasks - Clarification of ROGS Regulations Requirements*<sup>9</sup>.

**Assessment** means the process of collecting and judging evidence of a person's performance against a standard in order to determine whether the person has demonstrated competence. Evidence can include direct and indirect observations, written records, log books, practical and written tests and answers to questions. Assessment should be based on performance in the workplace, wherever possible.

**Assessor** is a person who carries out an **assessment** by judging the candidate's evidence against the standard and decides whether the candidate has demonstrated competence.

**Audit** is the structured process of collecting independent information on efficiency, effectiveness and reliability and making recommendations for any corrective actions.

**Candidate** means a person (ie external candidate) who applies for, or a person (internal candidate) who is nominated for, a job to carry out an activity that is new to the person.

**Client company** in this guidance is the company that lets a contract with a contracting company for work to be carried out (see **Contractor**).

**Competence** means ability to perform activities to the standards expected in employment; it is a combination of practical and thinking skills, experience and knowledge.

**Competence assessment** – see **Assessment**.

**Competence management** means the process of getting staff to be competent, followed by competence assessment and reassessment, and maintaining staff competence.

**Competence management system** means a process to develop and maintain staff competence, that includes **risk** assessments of activities, selecting suitable **standards** and using procedures and appropriate methods to carry out **competence management**, maintaining records, carrying out **verification**, **audits** and **reviews** of the system and feeding back recommendations to improve the system.

**Contractor** in this guidance means an individual employed by a contracting company that has a contract with the **client company** to carry out work. It includes any person who works for and may report to the management of the client company, but is not a member of staff of that client company, and includes agency staff and the self-employed.

**Control measures** are the mechanisms in place to control risks.

**Degraded operations** – see **Operations**.

**Development** means improving the performance of a person, especially following and in conjunction with training, so that the person gains sufficient practical experience to become competent.

**Emergencies** – see **Operations**.

**Generic standards** – see **Standards**.

**Good practice** is a way of carrying out an activity that is reasonably practicable and enforceable by HM Railway Inspectorate. It is not necessarily 'best practice', as best practice may be beyond minimum legal requirements.

**Hazard** means a thing, condition or situation with the potential to cause ill health and/or physical injury to people, damage to property, plant, products, or harm to the environment.

**Health** in this guidance means the avoidance of ill health.

**Human factors** means the environmental, organisational and job factors, and human and individual characteristics which influence behaviour at work in a way which can affect health and safety.

**Ill health** includes acute and chronic ill health caused by physical, chemical or biological agents as well as adverse effects on mental health.

**Incident** includes all undesirable events and near misses which could cause accidents.

**Job description** describes a job in terms of objectives and responsibilities; specific safety responsibilities may be included in a **safety responsibility statement**.

**Key performance indicators** are a group of statistics that summarise achievements which together indicate an overall level of performance of a process or system etc and show the change in performance over time.

**Line manager** is the manager with direct responsibility for those carrying out the activities, and may also be involved in appraisals and rewards. For some staff, their line manager is also their **supervisor**.

**Managers** in this guidance refers to the group of people operating the competence management system, including those carrying out the assessment, selection, recruitment, training, development, verification, audit, record keeping and administration (**see line manager**).

**Mentor** means a person who gives advice, has regular meetings and can be on call to discuss problems using one-to-one methods, but who is probably not the **line manager** or **supervisor** of the member of staff.

**Monitoring** means observing the performance of someone working; it can be formal (eg planned in advance), informal (eg 'managing by walking about') and unannounced (eg planned monitoring, but the place, date and time not announced beforehand).

**National occupational standard** is an occupational standard that has been developed by employers working with the Sector Skills Council for that industry (eg GoSkills for passenger transport, including railways) and accredited by a regulatory authority: QCA in England, DELLS in Wales, CCEA in Northern Ireland and SQA in Scotland.

**Occupational competence** in this guidance means the specific competence a person needs to have to carry out a work-defined activity.

**Occupational health and safety** means the health and safety of the people at work, including the effect of their own work, other people's work and their working environment on their health and safety.

**Occupational standards** are statements of what is required in terms of competent performance in employment – see **Standards**.

**Operations** in this guidance include:

- **normal operations** means the operation of that part of the railway in the way in which it was designed to operate (eg includes the rush hour peaks and troughs in demand experienced during the day);
- **degraded operations** means the state of part of the railway system when it continues to operate in a restricted manner (eg after the failure of one or more components, such as an escalator out of use or one track of a railway line out of use); and
- **emergencies** means current unforeseen or unplanned events that have life threatening or extreme loss implications and require immediate attention (eg a fire).

**Operational safety** means the **safety** of the operational railway.

**Professional competence** in this guidance means the specific competencies related to the assessment, selection, recruitment, training and development, verification and audit, record keeping and administration required by **managers** to implement the **competence management system**.

**Reasonably practicable** means that the degree of risk in a particular activity or environment can be balanced against the time, trouble, cost and physical difficulty of taking measures to avoid the risk. See page 46 *Successful Health and Safety Management*<sup>3</sup> for a legal definition.

**Recovery** concerns the actions of an operator to bring back into control a situation that is going 'off control', but before an out-of-control position is reached. Recovery may be necessary following equipment failure or human error. When assessing risk the probability that a competent person will be able to recover a situation provides an important additional variable.

**Remaining risks** refer to the **risks** remaining after **hazards** and risks have been eliminated or reduced as far as possible, and **control measures** have been applied to reduce the risks to as low as **reasonably practicable**.

**Review** means making the judgements about performance and the improvements resulting from **verification** and **audit**, determining if set objectives have been achieved and making recommendations for improvement.

**Risk** is some combination of the frequency of occurrence, probability of failure and severity of consequence. An additional variable that addresses the probability of failure to recover may be needed for assessing human factor risks.

**Safety** means the freedom from unacceptable risks of personal harm (ie the avoidance of accidents and incidents).

**Safety critical work** is defined in The Railways and Other Guided Transport Systems (Safety) Regulations 2006<sup>5</sup> and refers to those tasks which could significantly affect the health or safety of persons on a transport system.

**Safety responsibility statement** means a list of safety responsibilities, and is normally linked to a **job description**.

**Simulation** means a situation or environment that is reproduced, but not necessarily by a machine (eg a practice fire evacuation).

**Simulator** is a machine that simulates a working environment (eg to simulate a locomotive driving cab).

**Specific standards** – see **Standards**.

**Staff** are people who are directly employed by a company and on the company payroll, including those on a short term contract.

**Standards** in this guidance mean **occupational standards**; there are two main types:

- generic standards have a broad application to a variety of different work situations or equipment; and
- specific standards refer to specific types of situations or equipment.

To be effective in a particular job or occupation the standards describe the requirements in terms of:

- the particular skills that are essential to demonstrate competent performance;
- the knowledge and understanding that a person should have to support the required performance; and
- the performance criteria against which the performance of the person is assessed.

(See **National occupational standards**.)

**Subcontractor** in this guidance means an individual employed by a subcontracting company that has a contract with a contracting company (sometimes called the main contractor) to carry out work. Contracting companies often use subcontractors in two main areas; where specialist(s) are required (eg specialist welders) and where extra people are required to carry out the contract work.

**Supervisor** means a competent person who **monitors** a person's work, and takes responsibility for the work of a person who is not yet competent. Supervisors may carry out **competence assessments** of their **staff**, and also other staff in their own company. For some staff their supervisor may report to the **line manager**. For others their supervisor may also be their line manager.

**Trainer** means the person who carries out **training**, and may also carry out **development** of the person in preparation for **competence assessment**.

**Training** means formal and informal instruction of a person on how to carry out a work activity, taking into account their relevant background knowledge and understanding.

**Verification** means the systematic monitoring of the assessment process in terms of how well the **assessments** are carried out, and how the assessment process is applied. Verification is mainly directed towards determining compliance with the agreed standards, rules and procedures.

**Violation** is a deliberate deviation from a rule or procedure. Violations usually arise because of a desire to carry out the job despite the prevailing constraints, goals and expectations. Violations arise when people are trying to get the job done, and may not understand the consequences of doing so. They can be broken down into routine, situational and exceptional.

## APPENDIX 3 USEFUL ORGANISATIONS

A number of organisations that are referred to in Principle 2 in this guidance are listed below, together with their address and contact details. A brief outline of each organisation is given, together with its activities and relationship to other organisations.

### GoSkills

Concorde House, Trinity Park, Solihull, West Midlands, B37 7UQ

Tel: 0121 635 5520

Email: [info@goskills.org](mailto:info@goskills.org)

Website: [www.goskills.org](http://www.goskills.org)

GoSkills is the Sector Skills Council (SSC) for passenger transport, including railways and trams. SSCs are independent UK wide organisations developed by groups of influential employers in the sector. They are employer-led and actively involve trade unions, professional bodies and other stakeholders in the sector throughout the UK.

GoSkills has a core role in the passenger transport sector for ensuring that:

- the UK has the skills needed to respond to the Government's transport strategy;
- there is sufficient investment in providing better skilled people at all levels, including supervisory and managerial levels, as required by new legislation; and
- supply is matched to demand to ensure there is work-based training and other learning opportunities available to everyone across all industries in the sector.

### Qualifications and Curriculum Authority

83 Piccadilly, London W1J 8QA

Tel: 020 7509 5555, Fax: 020 7509 6666

Email: [info@qca.org.uk](mailto:info@qca.org.uk)

Website: [www.qca.org.uk](http://www.qca.org.uk)

The Qualifications and Curriculum Authority (QCA) is a non-departmental public body sponsored by the Department for Education and Skills (DfES). It is funded by government and accountable to a Board that is appointed by the Secretary of State for Education and Skills.

The role of QCA is to:

- make sure that examinations, qualifications and the national curriculum, with its associated tests, are delivered fairly, are of a high and consistent quality, and are appropriate to people's needs;
- act as the regulatory body that looks after what people are taught, how they are assessed and how they are recognised for what they have learnt;
- work with more than 100 bodies that award qualifications to ensure they comply with the regulatory criteria and codes of practice;

- work with sector skills councils (SSCs) to provide a continuous path through education to enable people to achieve qualifications that meet market needs; and
- have a leading role in defining qualifications related to specific industries.

### **Rail Safety and Standards Board**

Evergreen House, 160 Euston Road, London NW1 2DX

Tel: 020 7904 7777, Fax: 020 7557 9072

Email: [enquirydesk@rssb.co.uk](mailto:enquirydesk@rssb.co.uk)

Website: [www.rssb.co.uk](http://www.rssb.co.uk)

The Rail Safety and Standards Board (RSSB) provides leadership in the development of the long term safety strategy and policy for the railway industry. The company was established in April 2003. It is a not-for-profit company owned by the railway industry. The company is limited by guarantee, is governed by its members and has a board and an advisory committee. It is independent of any single railway company and of their commercial interests.

RSSB builds industry-wide consensus and facilitates the resolution of difficult cross-industry issues through the provision of knowledge, analysis, a substantial level of technical expertise, powerful information and risk management tools. This delivers a unique mix to the industry across a whole range of subject areas. The company also has a Heads of Agreement to work with GoSkills on national occupational standards and related skills issues.

It has technical expertise across the operations, management and engineering aspects of the railway including workforce development aspects of training and competence management. It also manages a research and development programme to assist the railway industry.

### **Sector Skills Development Agency**

3 Callflex Business Park, Golden Smithies Lane,

Wath-upon-Deerne, South Yorkshire S63 7ER

Tel: 01709 765 444, Fax: 0870 000 2401

Email: [info@ssda.org.uk](mailto:info@ssda.org.uk)

Website: [www.skillsforbusiness.org.uk](http://www.skillsforbusiness.org.uk)

The Sector Skills Development Agency (SSDA) is a non-departmental public body with the Chair and Chief Executive appointed by the Secretary of State for Education and Skills. It has a representative employer-led Board. SSDA funds, supports and champions the UK network of influential employer-led Sector Skills Councils (SSCs). The Skills for Business network comprises the SSDA and SSCs; there are 25 SSCs at the present time.

The role of the SSDA is to underpin and develop SSCs. The SSDA:

- funds, supports and monitors the performance of SSCs across the UK;
- ensures quality and consistent standards across the network;
- ensures skills provision is designed to meet sector needs;
- ensures generic skills are effectively covered in the work of SSCs; and
- promotes best practice sharing and benchmarking between sectors.



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RSP 3 Office of Rail Regulation 2007

While every effort has been made to ensure the accuracy of the references and web addresses listed in this publication, their future availability cannot be guaranteed.

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