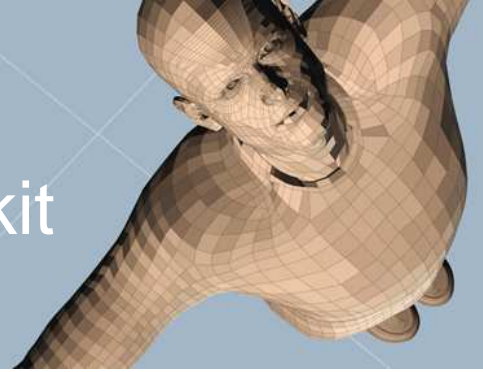


# The Network Rail Signaller Workload Toolkit



This is an introductory note intended to provide an overview of the aim and content of Network Rail's workload toolkit.

## What do we mean by the term workload?

Workload appears an obvious term to use when assessing a signaller's workplace, but the term workload means different things to different people. To some it means having too few staff, for others it means difficulties with the equipment.

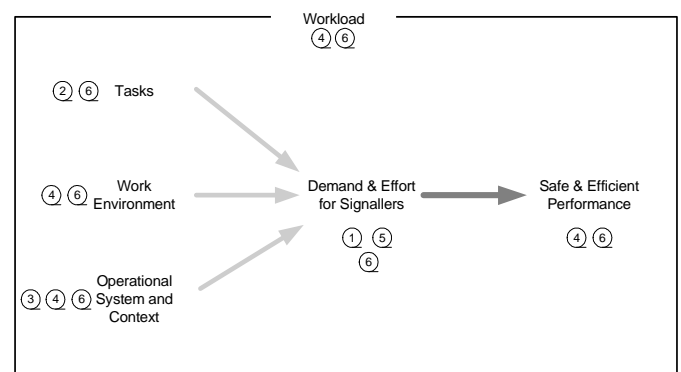
*'Workload is not an inherent property, but rather it emerges from the interaction between the requirements of a task, the circumstances under which it is performed, and the skills, behaviours, and perceptions of the operator.'* (Hart, 1988)

*'Mental workload is the effect of a complex interaction of individual, technical, organisational and social factors. Thus personal, technical and organisational factors and the effects of their interactions have to be taken into account in the design of work systems'* (European Standard, 2000)

There has yet to be a consensus on one formal definition of workload but an overview of several suggest that workload should be considered as a combination of factors concerned with:

- the task – the number and combinations of tasks they have to complete
- the context – how and where they have to complete them and the urgency or accuracy necessary to ensure safety and organisational performance targets are met
- the individual – a signaller's own skill, experience and perception of their work

This indicates that workload is a multi-dimensional concept which therefore requires a number of different techniques in order to assess it in an operational context. The diagram below highlights these key factors and how these different factors are measured by the different tools within the Network Rail Workload toolkit.



### Key

- |                                     |  |  |
|-------------------------------------|--|--|
| (1) Integrated Workload Scale (IWS) | (3) Operational Demand Evaluation Checklist (ODEC) | (5) Adapted Subjective Workload Tool (ASWAT) |
| (2) Activity Analysis Tool (AAT)    | (4) Workload Principles                            | (6) Workload Probe                           |



## What is the Network Rail (NR) workload toolkit?

The toolkit consists of six workload tools.

- For a simpler and quicker first analysis of the potential workload issues with a work system, a structured and weighted **Workload Principles Checklist** has been developed
- A simple self-report rating scale - the **Integrated Workload Scale (IWS)** which is used for job holders to record perceptions of workload at frequent intervals over a period of time whilst at their actual workplace.
- The IWS is normally used alongside an **Activity Analysis Tool (AAT)**, a recording of the actual activities taking place at the time. In parallel, an SME Commentary can be made, which is an explanation of the reasons for the activities observed, provided by a subject matter expert (SME) in real-time observation or from video
- The IWS can also be supplemented with the **Adapted Subjective Workload Analysis Tool (ASWAT)** which requires job holders to assess workload on three dimensions – time pressure, mental effort and pressure generally – in order to identify where the signaller's greatest demands or effort might be. It is useful for providing a retrospective comparison of signaller workload between two situations or different times in the day.
- A **Workload Probe** tool has been produced to allow analysts with human factors and rail expertise to analyse a job, scenario, workstation or function for its potential workload.
- The **Operational Demand Evaluation Checklist (ODEC)** is available for human factors specialists to work with managers to produce a complete scored assessment of the factors and entities in a system which might influence workload

## How are workload assessments undertaken?

The choice of methods and tools to undertake the assessment will be dependent upon the questions being addressed by the workload assessment.

A professional judgement will need to be made by the human factors expert leading the assessment, as every situation will be different. Whatever combination of tools is used the results are combined in such a way as to present a 'workload profile' of an area of control.

## How do we investigate the consequences of workload?

The consequences of workload problems can be noted in both signaller performance (safety and efficiency) and signaller wellbeing. Following a general workload assessment an assessment to target these may be necessary. Network Rail has a number of techniques available to undertake these types of assessments. This may include further investigations into signaller error, shift patterns, stress, fatigue etc. The Ergonomics National Specialist Team should be contacted to obtain and discuss such assessments.

## How do we judge if workload is acceptable?

The outcomes of any assessment must be judged in terms of acceptability of conditions at both extremes of the workload spectrum: underload and overload are both considered as unacceptable. Understanding if the workload is acceptable is not a cut and dried decision. The nature of workload and the influence that individual experiences have on it means a single figure is rarely adequate to judge workload as too high or too low. However, how compatible the working environment or context is in accommodating the signaller to achieve their work does offer a pragmatic approach to judging how acceptable their workload is.