

## **Managing Fatigue in Safety Critical Work**

Railways and Other Guided Transport Systems  
(Safety) Regulations 2005

**APPROVED CODE OF PRACTICE  
AND GUIDANCE**

## **Approved Code of Practice and guidance**

For convenience, the relevant text of the Railways and Other Guided Transport Systems (Safety) Regulations 2005 (referred to as ‘the Regulations’ from here on) is set out in *italic* typeface, with the accompanying guidance in standard typeface and the Approved Code of Practice (ACOP) in **bold** typeface.

## Regulation 25 Fatigue

### Regulation

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(1) *Every controller of safety critical work shall have in place arrangements to ensure, so far as is reasonably practicable, that a safety critical worker under his management, supervision or control does not carry out safety critical work in circumstances where he is so fatigued or where he would be liable to become so fatigued that his health or safety or the health or safety of other persons on a transport system could be significantly affected.*

(2) *The arrangements in paragraph (1) shall be reviewed by the controller of safety critical work where he has reason to doubt the effectiveness of those arrangements.*

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1 Regulation 25(1) places a general duty on every controller of safety critical work to have arrangements in place to ensure that safety critical workers do not carry out safety critical work where they are already fatigued, or work for such periods or have such work patterns that would be liable to cause them fatigue, such that the safety of persons on the transport system could be affected.

2 Regulation 25(2) provides that controllers of safety critical work review their arrangements for complying with Regulation 25(1) where they have reason to doubt the effectiveness of those arrangements.

3 Safety critical work can be undertaken on a transport system at any time during the day or night, in sometimes difficult circumstances and at times with demanding work schedules. The potential for fatigue should therefore be foreseeable in such circumstances. If adequate measures are not taken for any resulting fatigue to be controlled it can in turn lead to human error and give rise to significant risks to persons on the transport system. Fatigue has been identified as a causal factor in incidents on transport systems and can lead to reduced vigilance and alertness, increased errors, impaired decision making and a general deterioration in mood and motivation. Causes of fatigue are not limited to the effects of working for too long or the nature of the work, but could also include the effects of receiving too little rest.

4 When reading this ACOP, controllers of safety critical work should also give consideration to the requirements of the Working Time Regulations 1998 (as amended) (WTR). Whilst the WTR places maximum limits

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on the amount of time an employer can ask an employee to work, the provisions of the WTR are not in themselves sufficient to prevent safety critical workers from working when they are so fatigued, or liable to become so fatigued, that their health and safety, or the health and safety of other persons on a transport system could be significantly affected.

### **Approved Code of Practice on managing the risks arising from fatigue in persons undertaking safety critical work on the railways and other guided transport systems**

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**5** The controller of safety critical work should establish effective arrangements for managing the risks arising from fatigue in safety critical workers. This process should include the following stages:

**STAGE 1: Identifying those safety critical workers affected**

**6** Controllers of safety critical work should identify those persons carrying out safety critical work who are liable to be fatigued, or become fatigued when carrying out such work.

**7** In identifying such persons, controllers of safety critical work should take into account any relevant significant findings of risk assessments, which have been:

- carried out by transport operators in accordance with Regulation 19 of the Regulations; and
- conducted in accordance with the Management of Health and Safety at Work Regulations 1999.

**STAGE 2: Identifying and setting standards and working time limits**

**8** Controllers of safety critical work should identify, set and adhere to appropriate standards for working hours and working patterns, observing any relevant working time limits that apply.

**9** Those standards and limits that are set should take into account recognised national industry good practice standards, limits and guidance applying to railways and other guided transport systems.

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**10** In the absence of relevant recognised national industry standards and limits, the standards and limits that the controller of safety critical work sets should, so far as is reasonably practicable, take into account foreseeable causes of fatigue, including: job-design; the workload and the working environment; the shift system in operation; the higher levels of fatigue that can be caused by consecutive *night shifts* or *early morning shifts*; shift exchange; control of overtime; *on-call* working; the frequency of breaks; recovery time during periods of duty; and the nature and duration of any time spent travelling.

**11** Limits should be set for:

- (a) the maximum length of any work shift or *period of duty*;
- (b) the maximum period of time between breaks, including breaks for meals;
- (c) the minimum rest interval between any *periods of duty*;
- (d) the maximum number of hours to be worked in any seven day period;
- (e) the maximum number of consecutive shifts or *periods of duty*;
- (f) the minimum frequency of rest days;

**12** Working patterns should be designed to:

- (a) minimise the build up of fatigue by restricting the number of consecutive *night* or *early morning shifts*;
- (b) allow fatigue to dissipate by ensuring adequate rest between shifts and between blocks of shifts; and
- (c) minimise sleep disturbance.

**13** Appropriate rest periods should be provided before and within a *period of duty* to reduce the incidence of fatigue. Arrangements should be made for safety critical workers to take breaks during *periods of duty*, except where it is not reasonably practicable to do so and the work provides natural opportunities for relaxation or reduced vigilance. The length and timing of breaks should be appropriate to the nature of the

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work and the length of time spent on duty. Wherever reasonably practicable, safety critical workers who work at a workstation, such as a driver's cab or in a signal box, should be given the opportunity to spend breaks away from the workstation.

14 Any local agreements on rostering and working hours should be compatible with the standards and limits that have been identified and set.

<b>STAGE 3:      Limiting <i>exceedances</i></b>
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15 Controllers of safety critical work should ensure that any standards and limits that have been identified and set are only exceeded with their prior approval, on an infrequent basis, in exceptional circumstances.

16 Standards and limits should only be exceeded in infrequent and exceptional circumstances where extended working is necessary in order to avoid or reduce risk to the health and safety of persons on a transport system or significant disruption to services and it is not reasonably practicable to take alternative steps. Such circumstances would include extreme weather conditions, equipment failure, or an accident or other serious incident. By their nature, these circumstances will be unplanned and not foreseeable.

17 Planned or foreseeable training or safety briefings for safety critical workers should not be a reason for exceeding the standards or limits. These should be planned accordingly and any necessary contingency provision provided to ensure that the standards or limits are not exceeded. Neither should, for example, the existence of long standing job vacancies or planned organisational changes that affect the numbers of safety critical workers.

18 In exceptional circumstances where extended working is necessary, all reasonable steps should be taken to relieve safety critical workers who have worked in excess of any limits as soon as possible and to ensure that the minimum interval before their next *period of duty* (referred to in paragraph 11c) is observed.

<b>STAGE 4:      Consulting with safety critical workers</b>
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19 Controllers of safety critical work should consult with safety critical workers and their safety

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representatives on the arrangements needed to manage fatigue and when standards and limits are to be changed.

20 Following consultation, account should be taken by the controller of safety critical work of the views and experiences of the safety critical workers affected, as expressed either directly or through their safety representatives.

<b>STAGE 5: Recording the arrangements</b>
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21 Controllers of safety critical work should maintain a record of their arrangements for managing the risks arising from fatigue in safety critical workers.

22 Those arrangements should be incorporated into the safety management system for those controllers of safety critical work who are subject to Part 2 of the Regulations.

23 For those controllers of safety critical work who are not subject to Part 2 of the Regulations, the arrangements should be incorporated into their health and safety arrangements required by the Management of Health and Safety at Work Regulations 1999.

<b>STAGE 6: Providing information to safety critical workers</b>
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24 Controllers of safety critical work should provide to all safety critical workers under their management, supervision or control, comprehensible and relevant information on risks to health and safety owing to fatigue and on their arrangements for managing fatigue.

25 Controllers of safety critical work should ensure that safety critical workers are aware of:

- (a) their role and the requirements on them in meeting the arrangements for managing fatigue;
- (b) the impact of their activities on the safety of the transport system;
- (c) the influence that their alertness and fatigue can have on that safety when performing safety critical tasks;

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- (d) the standards and limits that apply to the work which they are to undertake;
- (e) the exceptional circumstances in which the limits can be exceeded with prior approval; and
- (f) the procedures to be followed if they consider that there are circumstances, such as significant life events or medical conditions, that may cause them to either be or become so fatigued that health and safety could be significantly affected.

**STAGE 7: Monitoring**

**26** The controller of safety critical work should monitor the arrangements for managing fatigue to assess how effectively they are controlling the risks arising from fatigue.

**27** The actual hours worked should be monitored. This should include any periods of overtime, whether planned or unplanned and any periods of non-safety critical work that could have a bearing on the safety critical worker's fatigue and ability to undertake the safety critical work. The work patterns undertaken by safety critical workers should be monitored against the standards and limits that the controller of safety critical work has identified and set.

**28** Where standards and limits have been exceeded, the reasons for the *exceedance* should be identified and suitable measures should be taken, such as modifying work patterns, to reduce the risks arising from fatigue and to prevent a reoccurrence of the *exceedance*.

**29** Excessive overtime levels that could have a bearing on the safety critical worker's fatigue and ability to undertake safety critical work should be monitored and controlled.

**30** The nature and duration of time spent travelling should be monitored and so far as is reasonably practicable controlled when it could have a bearing on the person's fatigue and ability to undertake safety critical work.



**ACOP****STAGE 8: Action when safety critical workers are fatigued**

**31** Controllers of safety critical work should ensure so far as is reasonably practicable that safety critical workers who report for duty where they are clearly unfit owing to fatigue, or who, through the course of their work shift become clearly unfit owing to fatigue, do not carry out or continue to carry out safety critical work.

**32** The reason(s) why the safety critical worker is, or has become fatigued should be established, so far as is reasonably practicable.

**33** In the event of a safety critical worker being so unfit, appropriate control measures, such as providing sufficient rest, should be applied before the safety critical worker commences or recommences carrying out safety critical work.

**STAGE 9: Reviewing arrangements**

**34** The controller of safety critical work should review their arrangements for managing the risks arising from fatigue when they have reason to doubt the effectiveness of the arrangements.

**35** A review should be undertaken where:

- (a) there has been a significant change in circumstances, such as job design, workload, or organisational changes;
- (b) there are plans to *change the existing working patterns and existing limits*;
- (c) there is a change in relevant recognised good practice standards and limits for managing fatigue in the railways and other guided transport systems;
- (d) fatigue has been identified as a causal factor in an incident investigation which gives reason to doubt the effectiveness of the arrangements;
- (e) monitoring has shown that standards and limits are being exceeded on a regular basis;

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- (f) long term sickness, a significant number of unfilled job vacancies or industrial action results in frequent *exceedances*;
- (g) there is a significant incidence of safety critical workers turning up for work fatigued;
- (h) there is a significant incidence of safety critical workers being stopped from carrying out safety critical work due to being unfit because of fatigue; or
- (i) there is any other reason to doubt the effectiveness of the arrangements.

36 So far as is reasonably practicable, recommendations from reviews related to fatigue should be acted upon by the controller of safety critical work.

## Definitions:

37 In this Code of Practice -

- (a) '*change to existing working patterns*' refers to the working pattern of persons undertaking safety critical work, and includes:
  - (i) increases in daily or weekly hours of work, increases in the number of consecutive shifts worked before a complete day's rest is taken, reductions in the length or frequency of intervals before, and breaks during, *periods of duty*, or changes in the timing of breaks taken during *periods of duty*;
  - (ii) changes in shift patterns, such as a change from *fixed shifts* to *rotating shifts*, a change in the frequency with which shifts rotate, increased variability in start and finish times, or the introduction of a *split shift* system; or
  - (iii) other changes in the organisation of working time which may affect performance, such as an increase in the amount of time spent carrying out safety critical work (as opposed to other activities) or in the amount of time spent carrying out safety critical work requiring continuous vigilance (as opposed to other types of safety critical work);

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- (b) **'exceedance'** means exceeding or other non-compliance with a standard or limit;
- (c) **'existing limits'** means:
  - (i) for operations already in existence, the limits already established in that operation; and
  - (ii) for new operations, limits which do not exceed the limits applying to persons carrying out the same or similar work in comparable established operations.
- (d) **'fixed shifts'** means that safety critical workers work the same shift on a permanent basis;
- (e) **'rotating shifts'** means that safety critical workers work a pattern of changing shifts;
- (f) **'on-call'** means waiting to respond to an emergency call out or answering a query from persons working in the field;
- (g) **'day or early morning shifts'** means a shift that usually starts around 05:00 to 08:00 and ends around 14:00 to 18:00;
- (h) **'night shift'** means a shift that usually starts around 22:00 to 02:00 and ends around 05:00 to 08:00;
- (i) **'split shift'** means one duty period, which has two distinct work periods separated by a long break; and
- (j) **'period of duty'** means a period of duty, which consists wholly, or partly, of safety critical work as defined in Regulation 23 of the Regulations, including overtime and meal or rest breaks. Where a *split shift* system is in operation, the total length of time between the start of the first and the end of the last part of that *split shift* counts as one *period of duty* for the purpose of this ACOP.

38 The definitions in this ACOP and related expressions shall be construed accordingly. Other defined terms are defined in the Regulations.

## Appendix Further Information

### Human performance, shiftwork and fatigue

*Reducing error and influencing behaviour.* HSG48 Second Edition HSE Books ISBN 0 7176 2452 8

Mont, TH and Folkard S *Making shiftwork tolerable* Taylor and Francis 1992 ISBN 0850668220

Moore-Ede, M *The 24 hour society: the risks, costs and challenges of a world that never stops.* Piatkus 1993 ISBN 0749912553

### Risk assessment methods for shiftwork and fatigue

Rogers, AS, Spencer, MB and Stone BM. Validation and development of a method for assessing the risks arising from mental fatigue. Contract research report 254/1999 HSE Books. (also available on HSE's website [www.hse.gov.uk/research/content/crr/1999/crr99254.pdf](http://www.hse.gov.uk/research/content/crr/1999/crr99254.pdf))

W S Atkins Ltd. Assessing the risks associated with fatigue in railway safety-critical tasks. Contract research report 188/1998. HSE Books.

### Management of health and safety

*Successful health and safety management.* HSG65 Second Edition HSE Books 1997 ISBN 0 7176 1276 7

*Management of health and safety at work: Management of Health and Safety at Work Regulations 1999: Approved Code of Practice and Guidance.* L21 HSE Books 2000 ISBN 0 7176 2488 9

*Railway safety critical work: Guidance on the definition of activities regarded as safety critical under the Railways (Safety Critical Work) Regulations 1994* HSC 1999 (on the HMRI home page [www.hse.gov.uk/railways/index](http://www.hse.gov.uk/railways/index)) . This is to be updated to take into account the new regulations.

*Developing and maintaining staff competence.* Railway Safety Principles and Guidance Part 3 Section A HSE Books 2002 ISBN 0 7176 1732 7

### Working time regulations

DTI free publication 'Your Guide to the Working Time Regulations' (ref: URN 03/1068). This can be obtained by calling DTI's Publications Order Line on tel: 0870 150 2500 or accessed via the DTI website [www.dti.gov.uk/er](http://www.dti.gov.uk/er) .

**Relevant professional societies**

Professional societies whose membership includes experts in human performance, fatigue, shift work and human reliability include:

The British Psychological Society, St Andrews House, 48  
Princess Road East, Leicester LE1 7DR

The Ergonomics Society, Elms Court, Elms Grove,  
Loughborough, LE11 1RG

Society of Occupational Medicine, 6 St Andrew's Place,  
Regent's Park, London NW1 4LB