

INTERIM ADVICE NOTE 190/16

Guidance on Processes for Managing Fatigue in the Workplace

Summary

Guidance on the processes for managing fatigue in the service provider workplace, in order to reduce risks to employees and improve the health, safety & wellbeing of employees.

This IAN 190/16 provides guidance to service providers on the processes needed for managing fatigue in the workplace, as part of the Fatigue Risk Management System.

Instructions for Use

This IAN 190/16 is supplementary to and should be read in conjunction with IAN 189/16 Policy on Managing Fatigue in the Workplace.

This IAN is supplementary to (but does not replace any elements of) existing legislation and HSE guidance documents relating to managing fatigue in the workplace.

This IAN is to be implemented by all service providers no later than Friday 30 December 2016, noting that separate guidance on managing fatigue in the workplace for Vehicle Recovery Operators is in preparation.

Table of Contents

Glossary of Terms	3
1. Introduction	5
1.1 Background	5
2. Considerations for Best Practice	6
2.1 Hours of work	6
2.2 Rest Periods and Rest Breaks	6
2.3 Highways England Passport Scheme	7
2.5 Work Demands	7
2.6 Work Environment	8
2.7 Work Scheduling / Planning	8
2.8 Non-Work Factors	9
2.9 "On call" Arrangements	9
3. Consultation with Employees	10
4. Contacts	11
5. Normative References	11
6. Informative References	11
Annex A - Frequently Asked Questions	13
Annex B – Example Extension of hours risk assessment	17
Annex C – Example Authorisation Form	19
Annex D - Example of a Timesheet incorporating requirements of a FRMS	20
Annex E - HSE Fatigue and Risk Index Calculator Tool	21
E1. Introduction	21
E2. Limitations of the Fatigue and Risk Index	21
Annex F – Worked Examples	22
Summary & Background	22
Annex F1	23
Annex F2	25
Annex F3	26
Annex F4	29
Annex F5	32

Glossary of Terms

Fatigue Risk Management System

The Fatigue Risk Management System (FRMS) is a process which gives guidance on how to reduce, as far as reasonably practicable, the risk of fatigue contributing to, or causing, an incident or accident. Refer to IAN 189/16, Section 2, for details.

HSE Fatigue and Risk Index Calculator Tool

The HSE Fatigue and Risk Index Calculator Tool (the "HSE Fatigue Tool") evaluates the pattern of shifts in a roster to identify the risks of fatigue or error occurring as a result of how those shifts were scheduled. The tool also takes account of additional factors that can cause fatigue, including commuting time, travel time, workload, level of attention required and arrangement of rest breaks. Refer to Annex E in this IAN for details. Worked examples showing how to use the HSE Fatigue Tool are included at Annex F in this IAN.

Employee

A person employed by a service provider. An employee may be a permanent member of service provider staff, or may be a temporary member of service provider staff, or may be an agency member of service provider staff.

Door to door time

A period of time identified as the combined total of commuting time, travel time and working time.

Commuting Time

A period of time during which an employee travels from a rest location to their contracted place of work, including the return journey, regardless of whether this rest location is permanent or temporary. This type of travel is when the employee is not at the disposal of the employer.

Travel Time

A period of time during which an employee travels whilst at the disposal of the employer, including carrying out activities or duties on behalf of the employer. This type of travel does not include Commuting Time.

Working Time

A period of time, inclusive of rest breaks, during which an employee is at the disposal of the employer including carrying out activities or duties on behalf of their employer. Part or all of this period may be Travel Time.

Work

Activities or duties carried out by an employee under the direction, responsibility and disposal of the employer.

Hours of Work

Actual (not rostered) time spent working at the employer's disposal, including overtime, rest days worked, paid travelling/walking time, handover/wash-up time and paid meal/rest breaks.

Place of Work

Location where an employee is working at the employer's disposal.

Rest Breaks

A short time of rest occurring within a shift or duty period, in accordance with the Working Time Regulations. A rest break occurs during Working Time.

Rest Location

Home or other temporary place of residence where the Rest Period can be achieved, in accordance with the Working Time Regulations.

Rest Periods

A period of time which is not Working Time, other than leave to which a worker is entitled to under the Working Time Regulations. Part of the Rest Period includes Commuting Time.

On Call

An individual waiting to respond to an emergency call-out or answering a query from people working in the field.

Roster / Working Pattern

Working time schedule depicting periods of duty or leave for individuals or groups.

Shift or Duty Period

A period of time when an employee is at the employer's disposal and undertakes designated duties and activities.

For operational staff, such periods of time at the employer's disposal normally have defined start and end times which may vary on a periodic basis in accordance with a predefined roster.

For non-operational staff, such periods of time at the employer's disposal may be self-determined and will include "on call" time when they are required to be at their employer's place of work.

Working Time Regulations

Refers to the Working Time Regulations 1998 and any subsequent published amendments.

1. Introduction

1.1 Background

IAN 189/16 “Policy on Managing Fatigue in the Workplace” was prepared following publication of Highways England’s Health and Safety 5 Year Plan in October 2015.

IAN 189/16 provides policy to service providers on managing fatigue in the workplace, for all service provider employees.

IAN 189/16 outlines how the management of risk associated with employee fatigue, especially with regard to night time working, very long working times, or split shift working, may be assessed using a Fatigue Risk Management System (FRMS). The monitoring of “door to door times”, “working times” and “driving times” and having suitable and sufficient mitigation measures in place to ensure employee fatigue risks are minimised.

1.2 Scope

This IAN 190/16 provides guidance to service providers on the processes needed for managing fatigue in the workplace, as part of a FRMS.

This IAN 190/16 includes worked examples showing how to evaluate the suitability of different working patterns, suggested documentation to be used and a list of “frequently asked questions”.

This IAN 190/16 is supplementary to IAN 189/16.

This IAN 190/16 is supplementary to (but does not replace any elements of) existing legislation and HSE guidance documents relating to managing fatigue in the workplace.

2. Considerations for Best Practice

2.1 Hours of work

When planning works, the safest and most efficient shift patterns should be used. The timing of shift patterns should take account of varying risks at different times of the day or night. For example, night shifts may mean reduced visibility and (at a specified location) may reduce the risk from the traffic flow adjacent to the working area. A suitable and sufficient risk assessment will assist in determining the pros and cons of carrying out the specified work activities at different times of the day or night. Legal requirements must be met at all times.

The following recommendations will assist in minimising fatigue risk:

- Assess the use of shift work to minimise risk.
- Limit the number of consecutive night shifts to six.
- Allocate shift workers consecutive days off.
- Schedule consistent start times or where rotating rosters are used, using forward rotation for shifts (morning-afternoon-night) rather than a backward rotation (night-afternoon-morning).
- Identify ways to make sure shifts do not extend beyond usual finish times, for example, hold points to ensure that an activity that cannot be stopped part way through is not started if it cannot be finished within the shift, e.g. road planing and resurfacing a carriageway.
- Monitoring actual hours worked against rostered hours to identify and review situations where excessive hours are being worked.
- Allowing new employees and employees returning from leave time to acclimatise to shift arrangements.
- Developing procedures for managing shift-swapping and reducing recalls to duty, for example, visualisation boards where all information is readily available and it is simple to highlight the important issues at handover.
- Split shift times need careful planning in advance. For example a person normally works day time hours, but has to visit sites occasionally at night time whilst works are being carried out.

2.2 Rest Periods and Rest Breaks

Refer to the Glossary of Terms in this IAN 190/16, for the definition of rest period and rest break.

In order to work safely, it is important that all personnel get sufficient rest. The FRMS should describe how suitable and sufficient rest periods and rest breaks are achieved. These rest periods and rest breaks must adhere to the legal requirements in the Working Time Regulations and summarised in IAN 189/16.

In addition, the employer should provide advice and encouragement to employees on how they can obtain suitable rest in order to ensure they are fit for work, both before work commences and during work.

2.3 Highways England Passport Scheme

Highways England will be introducing the Passport Scheme in April 2016 and all service providers working on the Strategic Road Network are required to register their employees.

This service will:

- Reduce site registration times using smart phone technology;
- Verify that 100% of people accessing the Strategic Road Network have the correct credentials to do so;
- Provide an extended lone worker support solution;
- Provide a registry of the people and skills that are on site;
- Improve our capability to manage risks associated with fatigue;
- Seek opportunities to improve and stream frontline processes; and
- Provide Highways England and service providers with the ability to share information with other DfT companies.

2.4 Site Specific Risk Assessments with consideration of fatigue issues

As part of the FRMS, the service provider is recommended to include the following in their site specific risk assessments, to ensure the risk of fatigue to employees is minimised, to as low as reasonably practicable:

- The overall risk category for individual activities and periods of work during the duty period or shift, especially with regard to fatigue. This means that during a duty period or shift, there may be different risk categories for different periods of time. **Special attention should be given to any work involving special hazards or heavy physical work or mental strain.**
- All factors that are likely to cause fatigue during a duty period or shift.
- Outputs from use of the HSE Fatigue Tool for the employees on the duty period or shift.
- All control measures that could be implemented if needed, during or after a duty period or shift, to mitigate against fatigue.
- The rest breaks that will be needed to achieve compliance with legal requirements and how these will be provided during the duty period or shift. **Special attention should be given to rest breaks for night workers.**

2.5 Work Demands

The FRMS should identify activities and tasks which result in mental stress and strain that may contribute to fatigue, and identify means to reduce or mitigate the effects.

In order to reduce the risk of fatigue the following points should be considered when developing a risk assessment:

- Introduce a variety of tasks to minimise physical and mental demands and assist in maintaining alertness during a shift.
- Use plant, machinery and equipment (such as lifting equipment) to eliminate or reduce excessive physical demands. Further guidance can be found in Highways England's B8 Manual Handling Raising the Bar document.
- Introducing job rotation to limit a build-up of mental and physical fatigue. Further guidance can be found in Highways England's B12 Occupational Health Raising the Bar document.
- Reduce the working time by introducing regular rest breaks in addition to scheduled meal breaks, or by shortening shift periods.

2.6 Work Environment

The work environment can influence the likelihood of fatigue and this can change on a daily basis, for example, a ground worker is more likely to become fatigued in extreme weather, even though they may be conducting a task they are familiar with. In order to reduce the risk of fatigue the following points should be considered when developing a risk assessment:

- Avoid physically demanding work during periods of extreme temperature or severe wind chill conditions, or increase the frequency of breaks, or modified working conditions are provided to reduce fatigue risks.
- Use heating/cooling devices in extreme temperature work environments (where appropriate) and/or providing appropriate work clothing and shelter for the conditions.
- Install ventilation/cooling devices in hot, confined work environments such as vehicle cabins.
- Provide access to facilities for rest, meal breaks and other essential requirements such as bathroom facilities.
- Provide access to accommodation when employees need to work away from home, where the sleep environment is conducive to restorative sleep (i.e. quiet, dark, cool), further guidance can be found in Highways England's B6 Caravan/Temporary Sleeping Accommodation Raising the Bar document.
- Monitor exposure to noise, temperature and chemicals and enforcing strict controls to ensure that exposure is limited.
- Provide suitable and sufficient personal protective equipment for the conditions and ensure correct use where appropriate.
- Rotate employees through different tasks to reduce the effects of environmental factors on fatigue.

2.7 Work Scheduling / Planning

The risk from fatigue can be minimised through thorough scheduling and planning. The following points should be considered when scheduling and planning work:

- Manage deadlines so the workload can be undertaken safely. This may mean ensuring that there is not a rush towards the end of a programme, or that there are not incentives to finish a task more quickly than is needed for safe working.
- Include adequate breaks during a work schedule, especially during a night shift.
- Make sure there are adequate resources to do the job, so breaks during and between shifts are not adversely affected and excessive demands are not placed on employees.
- Arrange for vacant positions to be filled in a timely manner to ensure there are sufficient numbers of employees to complete work schedules using safe working.
- Plan work tasks so that work demands decrease towards the end of the shift.
- Review supply chain working practices to ensure that double shifting (moonlighting) is not occurring.
- Consider using some form of "Declaration" process at the beginning of shifts for personnel to confirm they are not "fatigued" and to provide details of any other work they may have undertaken that day.
- Consider the use of Post Codes (or some other process) to determine the travel time (from rest location to work location) undertaken by personnel at both start and finish of each work period.

Annex D shows an example of a suitable timesheet that incorporates a number of the planning/monitoring requirements of a FRMS.

2.8 Non-Work Factors

Fatigue can be caused by external influences outside the control of the workplace. Support and assistance should be provided in order to assist the affected individuals and ensure their safety. Points to consider include:

- Briefing employees on fatigue risk factors and their responsibility to present themselves for work as fit for duty.
- Checking that employees are fit-for-work and encouraging them to self-identify fatigue risks where appropriate.
- Following up when an employee self-identifies by identifying difficulties she/he may have with Rostering arrangements, health conditions, and family/carer responsibilities.
- Assessing applications for secondary employment and approving applications only if the employers are satisfied that there is no increased risk of fatigue.
- Encouraging employees to seek medical advice to manage both temporary illnesses and chronic health conditions which may lead to higher levels of fatigue.
- Providing new employees and those returning from leave with time to acclimatise to shift arrangements.
- Monitoring leave to ensure employees do not accrue excess annual leave.
- Monitoring sick leave to make sure that employees affected by fatigue are identified and managed appropriately.
- Referring employees who may be experiencing fatigue as a result of personal issues to the organisations Employee Assistance Program or similar.

Individual factors, for example medical conditions (e.g. Sleep Apnoea) should be considered. Individuals also have a responsibility to manage their sports and social commitments to ensure they are fit for work.

2.9 “On call” Arrangements

It is recognised that “on call” arrangements are common place within the highways industry and these need to be considered and included within the FRMS.

For personnel who are “on call” at their “rest location”, consideration needs to be given regarding their specific arrangements, including whether they are able to rest and how soon they need to arrive at work if called out. However, in all cases, should an individual be called out to work, then an appropriate risk assessment needs to be undertaken (utilising the “Extension of hours risk assessment” in Annex B) in addition to a review of their rostering pattern. It is likely that the recommended 12 hours rest period between shifts will be adversely affected, when an employee is called out to work, which may add significant fatigue risks to the employee on call and to other employees when at work.

3. Consultation with Employees

When setting up new shift patterns, or changing existing shift patterns, employees should be consulted via their workforce representatives. It should be noted that some personnel may wish to work longer but fewer shifts, though this could increase the chance of fatigue, so these should be reviewed to balance operational, personal and health & welfare needs and ensuring compliance with legal requirements. Recommended actions:

- Prepare and issue to staff a **Fatigue Risk Management Policy**, as part of the FRMS.
- Promote workforce awareness and engagement with regard to minimising fatigue.
- Arrange staff training on use of the HSE Fatigue Tool.
- Discuss arrangements for “working time” and “door to door” time.
- Identify risks to individuals through occupational health reviews.
- Avoid rostering staff to the limits, as this leaves no time for contingencies.

4. Contacts

Further information may be obtained from:

Mark N. Pooley,
Health & Safety Division,
Professional & Technical Solutions,
Highways England,
Bridge House,
1 Walnut Tree Close,
Guildford,
Surrey, GUI 4LZ.

Tel: 0300 470 1227.

Email: Standards_Enquiries@highwaysengland.co.uk

5. Normative References

Legislation

The Working Time Regulations 1998 (as amended).

<http://www.legislation.gov.uk/uksi/1998/1833/contents/made>

The Working Time (Amendment) Regulations 2003.

<http://www.legislation.gov.uk/uksi/2003/1684/contents/made>

The Management of Health & Safety at Work Regulations 1999.

http://www.legislation.gov.uk/uksi/1999/3242/pdfs/uksi_19993242_en.pdf

6. Informative References

HA Raising the bar guidance 6, published March 2014:

<https://www.gov.uk/government/publications/health-and-safety-for-major-road-schemes-temporary-sleeping-accommodation>

HA Raising the bar guidance 8, published March 2014:

<https://www.gov.uk/government/publications/health-and-safety-for-major-road-schemes-manual-handling>

HA Raising the bar guidance 12, published March 2014:

<https://www.gov.uk/government/publications/health-and-safety-for-major-road-schemes-occupational-health>

HA Raising the bar guidance 22, published March 2014:

<https://www.gov.uk/government/publications/health-and-safety-for-major-road-schemes-fatigue>

IAN 189/16 Policy on Managing Fatigue in the Workplace.

HSE guidance "Managing Shiftwork", published 2006:

<http://www.hse.gov.uk/pubns/priced/hsg256.pdf>

HSE update on research.

<http://www.hse.gov.uk/research/rrhtm/rr446.htm>

HSE the development of a fatigue and risk index for shift workers, 2006.

<http://www.hse.gov.uk/research/rrpdf/rr446.pdf>

HSE fatigue and risk index calculator guidance.

<http://www.hse.gov.uk/research/rrpdf/rr446g.pdf>

HSE fatigue and risk index calculator tool:

www.hse.gov.uk/research/rrpdf/rr446cal.xls

Evaluation of the UK Rail Sector Initial Fatigue & Risk Index Thresholds: Identifying Good Practice

http://orr.gov.uk/_data/assets/pdf_file/0004/4378/sres-EvalRailFRIT.pdf

ORR Managing rail staff fatigue, 2012.

http://orr.gov.uk/_data/assets/pdf_file/0005/2867/managing_rail_fatigue.pdf

Management of Fatigue: Control of working hours for staff undertaking safety critical work

<http://standards.globalspec.com/std/1466231/nr-l2-erg-003-issue-5>

Annex A - Frequently Asked Questions

A1 GENERAL

(1) I comply with the Working Time Regulations, do I need to comply with these rules?

- The Working Time Regulations are a legal requirement. The recommendations in this IAN are best practice and there is an expectation that all Highways England service providers will follow this guidance or be able to demonstrate an alternative process (that is suitable and sufficient) for monitoring fatigue and mitigating risks causing fatigue.

(2) How do we monitor the hours of personnel working in different sectors?

- Best practice includes the use of a "signing in" document and or system in which the individual(s) would have to declare any other work having been undertaken. This places a responsibility on the individual(s).

(3) How should "salaried" staff monitor their hours?

- Employees should record actual hours worked (if there is a process for doing so). If there is no process, then some form of record should be maintained to demonstrate compliance with recommendations in this guidance. This is especially important for shift working, split shift working, night time working and "on call" arrangements.

(4) If someone travels the day before in readiness for a shift, should this be included as working time?

- If they are travelling to their permanent place of work from their rest location (temporary or permanent) then this should be deemed as commuting time. If they are travelling to an alternate work place or temporary accommodation at the request of their employer then this should be classed as travel time, as the employee is at the disposal of the employer.

(5) How do "management" monitor their hours?

- As with "salaried staff" they should record actual hours worked (if there is a process for doing so). If there is no process, then some form of record should be maintained to demonstrate compliance with this guidance.

(6) If personnel travel together in a mini bus, are they all classed as travelling?

- Yes. Travelling in a bus or as a passenger in a car/van is not deemed to be at your "rest location".

(7) Is there any guidance on the HSE Tool Default settings?

- There is User Guidance on the Fatigue & Risk Index Calculator available for download on the HSE website.

(8) Are service providers able to exceed the Fatigue and Risk Index benchmark scores?

- Yes, but only if, following the Fatigue Risk Management System process and after implementing appropriate "control measures" an individual or individuals have calculated Fatigue and /or Risk index scores above the recommended benchmarks. If this is the case, then a Risk Assessment should be undertaken and approved by the appropriate person.

(9) Is an employee's "rest location" just his / her home?

- A "rest location" is home or any other temporary place of residence where the rest period can be achieved. This may be a hotel, bed & breakfast, mobile home, or rented temporary accommodation.

(10) Are service providers able to exceed the "Standard Rules" that are identified in IAN 189/16, Figure 3?

- If the "Standard Rules" are exceeded during planning, then the FRMS process including the HSE Fatigue Tool and any additional guidance within this IAN should be followed to ensure that the Standard Rules are met.
- If the "Standard Rules" are exceeded during an unplanned event then an "Extension of Hours Risk Assessment" and an "Authorisation Form" needs to be undertaken at the time of the unplanned event. Examples of these forms can be found at Annexes B and C.

(11) When do Risk Assessments need to be undertaken?

- Risk Assessments are fundamental to all activities. However, specifically relating to the Fatigue Risk Management System process, additional fatigue risk assessments are required:
 - (a) When the planned work is calculated to be above the Fatigue Index and / or Risk Index benchmarks.
 - (b) When an unplanned event occurs during the work shift necessitating the individual or individuals to exceed their planned hours.

(12) Who should complete the HSE Fatigue Tool?

- Completion of the HSE Fatigue Tool shall be determined by the service provider. In some cases it may be on an individual basis, in other cases there may be a manager or administrator who undertakes the calculations.

(13) How should service providers monitor employee hours for "emergencies" i.e. an unplanned event?

- The FRMS process allows for additional hours to be worked for unplanned events following an "Extension of Hours Risk Assessment" and suitable authorisation form.

A2 CALCULATIONS

(14) Can a group of people be calculated together?

- Yes, providing that all the criteria used is the same, i.e. the same start and finish times, same travel times and same default settings, if using the HSE Fatigue Tool.

(15) When do we complete an Extension of Hours Risk Assessment Form?

- An Extension of Hours Risk Assessment Form is used to approve additional hours on a planned shift due to unforeseen issues. It is completed and authorised in accordance with the service provider's processes.

(16) When do we complete an Authorisation Form?

- An Authorisation Form is used to approve personnel who are still calculated above the HSE benchmarks of "45" or "35" for Fatigue* and "1.6" for Risk after all mitigation measures have been considered. The specific process for undertaking this will be determined by individual companies based upon their size and structure.
- *"45" is for night work or a combination of day and night work. "35" is for day working only.

(17) Should tool calculations be undertaken weekly, continuously?

- If the HSE Fatigue Tool is being used continuously for an individual(s), then the calculations should also be continuous.
- The HSE Fatigue Tool should not be used on an "ad hoc" basis (for a few days, or for a week or two) as this will provide incorrect results. A minimum of 4 weeks data should be used.

(18) Should courses / training/ toolbox talks be included in Rostering & HSE Fatigue Tool Calculations?

- They all need to be treated as working time as the employee is at the disposal of the employer.

(19) If there are different lengths of travel at the beginning and end of a shift, what should be used?

- For the purposes of the HSE Fatigue Tool it is recommended that for differing commuting times that the average is used for that particular day. So if it takes 2 hours to get to work on a morning and is only 30 minutes at night (due to say local accommodation being used), then the average of 1hr and 15 minutes should be used. Those in charge of inputting this information into the HSE Fatigue Tool should however do this with caution and are advised to question and take action on excessive or unrealistic commuting times. Refer to the Glossary of Terms for "travel time" and "commuting time" definitions.

(20) The roster has planned hours, however, the actual hours may be different. How does this affect the way fatigue is managed?

- The process consists of two basic constituents, firstly to plan the work shift patterns and secondly to review the planned work and amend in line with actual hours. This process is aligned to the 4 steps of a good Fatigue Risk Management System (FRMS) as provided by the Office of Rail and Road (ORR).

A3 SHIFTS

(21) How do we deal with "Split Shifts"?

- If split shifts necessitate any working to be undertaken at night (more than 3 hours work between 23.00 & 06.00) then the HSE Fatigue Tool should be used to calculate Fatigue and Risk Index Scores.

(22) We have staff who only undertake occasional night shifts. How are these monitored?

- Any work to be undertaken at night (more than 3 hours work between 23.00 & 06.00) requires the HSE Fatigue Tool to be used to calculate Fatigue and Risk Index Scores.
- This "night shift" may be in addition to having worked during the day or may be a "one off" situation.

(23) Is there any set periods of rest between shifts?

- This process requires compliance with the "Standard Rules" and the HSE Tool Index benchmarks identified in IAN 189/16.
- Pages 15 & 16 from the HSE Research Report 446 "The Development of a fatigue / risk index for shift workers" make a number of observations you may wish to consider.

A4 SUPPLY CHAIN

(24) What about the Supply Chain working for a service provider?

- The "supply chain" need to be engaged with the fatigue management process. Service providers need to ensure that their supply chain are able to provide evidence of compliance with IAN 189/16 and IAN 190/16.

(25) Do Tier 2 and Tier 3 service providers need to comply with this Fatigue Guidance?

- Any service provider or supplier in contract with Highways England is expected to implement IAN 189/16 and IAN 190/16 by no later than Fri 30.12.16.
- For Tier 2 and Tier 3 service providers who may be contracted to the Tier 1 service provider and not directly to Highways England, there is an expectation that legal requirements are implemented at all times and the Tier 1 supplier needs to ensure that as far as reasonably practicable, their Tier 2 and Tier 3 service providers and their supply chain suppliers implement the policy in IAN 189/16 and the guidance in IAN 190/16 by no later than Fri 30.12.16.

(26) Tier 2 and Tier 3 service providers and suppliers work for a number of clients each day and may only work for a Highways England service provider for a short duration one off job. How does the Highways England service provider deal with this situation?

- For Tier 2 and Tier 3 service providers who may be contracted to the Tier 1 service provider and not directly to Highways England, there is an expectation that legal requirements are implemented at all times and the Tier 1 supplier needs to ensure that as far as reasonably practicable, their Tier 2 and Tier 3 service providers and their supply chain suppliers implement the policy in IAN 189/16 and the guidance in IAN 190/16 by no later than Fri 30.12.16.
- Best practice would be to always ensure use of a "signing in" document in which the individual(s) would have to declare any other work having been undertaken for other clients, or for the same client. This places a responsibility on the individual(s).

Annex B – Example Extension of hours risk assessment

This form is to be used to authorise the exceedance of planned hours resulting from an unplanned event. It should be noted that once an employee has signed this form it can still be revised at any time if they believe that they are unable to continue working.

This assessment must only be made if there is an exceptional circumstance which:	
<ul style="list-style-type: none"> ○ is likely to increase the risks to health and safety of colleagues or the public. ○ is likely to cause significant disruption to the public and it is not reasonably practicable to take alternative steps e.g. by providing relief staff. 	
The circumstances that have led to this situation are:	Tick those applicable
Extreme weather conditions:	
Equipment failure:	
Accident or serious incident:	
Shortage of staff which was not foreseeable e.g. sudden illness, and which would cause significant operational disruption:	
Other (provide details):	
What alternatives have been considered and why are they not being implemented?	

Details of type of exceedance

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Estimated exceedance	Additional hours or additional shifts:
-----------------------------	--

Details – the person who is required to work extended hours

Name:	Project:
Position:	Location:
Company:	Work type:
Date:	Duties:

Employee considerations	Yes	No
Has the employee had their recommended 12 hour (11 hour legal) rest break prior to the start of this shift?		
Does the employee show signs of fatigue?		
As the person who is required to work extended hours, I confirm that I am not fatigued and am willing to extend my working hours.*		
Name:	Signature	Date:

** This can be reviewed at any period of time during or after the extended period if the person feels that they have become fatigued.*

The activity specific risk assessment has been reviewed in light of the above change in circumstances and *(delete as appropriate)* remains valid/ has been revised to take account of changes.

Requested by (Line Manager):		Signature:		Date:
Authorised by (Senior Manager):		Signature:		Date:

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Annex C – Example Authorisation Form

This form is to be used to authorise the exceedance of planned hours during the planning of Rosters after all control measures have been exhausted.

Authorisation form for WORKING BEYOND fatigue management good practice Benchmarks for Fatigue and/or Risk.

Ensure that all the Control Measures considered are recorded before completing and authorising.

Note: Only **one** exceedance for a **single individual** may be authorised on this form.

Details required:	Location:		
	Date:		
	Shift:		
	Task:		
Individual details:	Name:	Sponsor:	
Threshold breached: (tick as applicable)	<input type="checkbox"/> Fatigue index score over 45 (Nights) or 35 (Days) <input type="checkbox"/> Risk index score over 1.6 <input type="checkbox"/> Other (provide details)		
Circumstance(s) justifying threshold breach: (tick as applicable)	<input type="checkbox"/> No alternative resource <input type="checkbox"/> Safety critical task		<input type="checkbox"/> Emergency works <input type="checkbox"/> Other (provide details)
Mitigation measure(s) identified to reduce the additional risk as far as reasonably practicable: (tick as applicable)	<input type="checkbox"/> Staying in local accommodation <input type="checkbox"/> Reduction in shift(s) lengths <input type="checkbox"/> Increased frequency of breaks <input type="checkbox"/> Reduced commuting time		<input type="checkbox"/> Use of public transport <input type="checkbox"/> Occupational health assessment <input type="checkbox"/> Other (provide details)
Assessed by:	Name:	Date:	
Authorised by:	Name:	Date:	
Assessed and agreed by: (employee)	Name:	Date:	
Assessing Manager to confirm actual threshold breach following shift.	Actual Fatigue & Risk Scores:		
	Name:	Date:	

Annex E - HSE Fatigue and Risk Index Calculator Tool

E1. Introduction

The HSE Fatigue and Risk Index Calculator Tool (the “HSE Fatigue Tool”) is a simple to use spreadsheet, to monitor the suitability of shift patterns.

The screenshot shows the 'Fatigue Index Calculator' spreadsheet. The interface includes input fields for 'Company', 'Location', 'Shift ID', 'Date', and 'Assessor'. There are checkboxes for 'Display schedule' and 'Display charts'. A 'Mode' section has buttons for 'Fatigue', 'Defaults', 'Reset Index', and 'Calculate Index'. The spreadsheet columns are: Day, On Duty, Off Duty, Job type / breaks, Commuting Time, Duty Length, Rest Length, Average duty per day, Cumulative component, Duty timing component, Job type / Breaks component, and Risk Index. The spreadsheet is titled 'Fatigue Index Calculator' and includes a link to the manual: <http://www.hse.gov.uk/RESEARCH/rmpdf/r446g.pdf>. It also displays '© Crown Copyright 2005 Version 2.3' and an 'About' button.

The calculator contains two separate indices, one which relates to fatigue (fatigue Index) and one that relates to risk (risk Index).

While the two indices are similar in many respects, they diverge in others. The main differences are due to the different time of day effect: the peak in risk occurs close to midnight, whereas the peak in fatigue tends to occur some five hours later, in the early morning. Therefore, when assessing a pattern of work it is important to review both the fatigue and risk indices.

In the risk assessment spreadsheet, both the risk and the fatigue indices are expressed in terms of three individual components:

1. A cumulative component. This relates to the way in which individual duty periods or shifts are put together to form a complete schedule. The cumulative component associated with a particular shift depends on the pattern of work immediately preceding that shift.
2. A component associated with duty timing, i.e. the effect of start time, shift length and the time of day throughout the shift.
3. A job type / breaks component. This relates to the content of the shift, in terms of the activity being undertaken and the provision of breaks during the shift.

Further guidance on interpreting fatigue and risk index outputs is available on the HSE website.

E2. Limitations of the Fatigue and Risk Index

It is important to note that the fatigue and risk Index (FRI) is based on group data and does not take into account factors such as individual differences (e.g. age), specific work-related issues (e.g. exposure to chemical hazards), or social factors (e.g. lifestyle, domestic responsibilities), although it should be recognised that that these may affect an employee's tolerance to shift work. The industry sector and the type of work carried out will also affect the risk of fatigue and it is important to recognise that the mathematical formulae used in the FRI cannot take into account such variations.

Annex F – Worked Examples

Summary & Background

In this Annex, there are five worked examples, based upon typical scenarios:

- Scenario 1 Office employee normally working days, carrying out a 4 hour H&S night tour on a Monday night, starting at 22.00. Refer to Annex F1.
- Scenario 2 Network maintenance employee normally working nights, where the operative may have stayed up all day (Sun, Mon) and then turn up to work on the Monday evening for a sequence of five nightshifts. Refer to Annex F2.
- Scenario 3 Network maintenance employee normally working nights, attending a road accident (with Emergency Traffic Management) at night. Refer to Annex F3.
- Scenario 4 Supervisor / Manager normally working nights, attending a daytime meeting on a Thursday. Refer to Annex F4.
- Scenario 5 Day Time Network maintenance employee in severe weather conditions lasting more than 8 hours, e.g. snow ploughing or dealing with major flooding. Refer to Annex F5.

In order to undertake the calculations, assumptions have been made for the “default settings” on the HSE Fatigue Tool as follows:

Daily Travel: 1 hour from “place of rest” to and from place of work.

Rest Breaks: Every 4 hours for 30 minutes.

Workload: Moderately demanding, little spare capacity.

Attention: Most of the time.

Notes:

1. It should be noted that the default settings, together with the specific start and finish times will all affect the Fatigue and Risk Index calculations.
2. Any planned working patterns need to comply with the Working Time Regulations, so although it is possible to plan night shift working in excess of 8 hours, the average night shift length must not exceed 8 hours over a 17 week reference period. This can be seen in the examples in Annex F2, F3, F4 and F5.
3. The scenarios (2, 3 & 4) for night time working have been based upon work which is not classified as “significant risk” as noted in Section 6(7) of the Working Time Regulations. **For night work classified as “significant risk” the maximum working time is 8 hours**, in accordance with the Working Time Regulations.

Annex F1

Office employee normally working days, carrying out a 4 hour H&S night tour on a Monday night, starting at 22.00.

Note: The hours shown in tables are “actual hours on site”. 1 hour has been used for travel to and from site.

Day	Start	Finish	FI	RI
Mon	08:00	16:30	1.38	0.72
Tues	08:00	16:30	2.51	0.75
Wed	08:00	16:30	4.03	0.79
Thurs	08:00	16:30	5.78	0.83
Fri	08:00	16:30	7.49	0.87
Mon	08:00	16:30	2.13	0.77
Tues	08:00	16:30	3.49	0.80
Wed	08:00	16:30	5.20	0.84
Thurs	08:00	16:30	6.94	0.88
Fri	08:00	16:30	8.55	0.92
Mon	08:00	16:30	2.23	0.78
Tues	08:00	16:30	3.64	0.82
Wed	08:00	16:30	5.36	0.86
Thurs	08:00	16:30	7.09	0.90
Fri	08:00	16:30	8.69	0.93
Mon	08:00	16:30	2.25	0.79
Tues	08:00	16:30	3.66	0.82
Wed	08:00	16:30	5.38	0.86
Thurs	08:00	16:30	7.11	0.90
Fri	08:00	16:30	8.71	0.94

Scenario 1 Example 1.

The office employee normally works Monday to Friday for 8 hours per day.

The Fatigue Index (FI) and Risk Index (RI) calculations show that this work pattern does not exceed the benchmarks of “35” for Fatigue (on day shift working) and “1.6” for Risk Index.

Day	Start	Finish	FI	RI
Mon	12:00	16:30	0.78	0.72
Mon	20:00	00:00	14.60	1.19
Tues	12:00	16:30	10.42	1.06
Wed	08:00	16:30	14.54	1.12
Thurs	08:00	16:30	15.13	1.16
Fri	08:00	16:30	15.63	1.20
Mon	12:00	16:30	1.67	0.87
Mon	20:00	00:00	16.72	1.37
Tues	12:00	16:30	12.65	1.21
Wed	08:00	16:30	16.36	1.28
Thurs	08:00	16:30	16.67	1.32
Fri	08:00	16:30	16.95	1.36
Mon	12:00	16:30	1.78	0.92
Mon	20:00	00:00	16.86	1.42
Tues	12:00	16:30	12.80	1.26
Wed	08:00	16:30	16.47	1.33
Thurs	08:00	16:30	16.78	1.37
Fri	08:00	16:30	17.03	1.41
Mon	12:00	16:30	1.79	0.93
Mon	20:00	00:00	16.88	1.44
Tues	12:00	16:30	12.82	1.28
Wed	08:00	16:30	16.48	1.34
Thurs	08:00	16:30	16.79	1.38
Fri	08:00	16:30	17.04	1.42

Scenario 1 Example 2.

The office employee normally works Monday to Friday for 8 hours per day and needs to undertake a 4 hour Monday night Health & Safety Tour each week.

For this example, the office employee would not be able to commence work before 12.00 each Monday and have completed the night safety tour by 00.00.

A 12 hour rest period between shifts is recommended which includes an 11 hour legal rest period, therefore the office employee should not return to work until after 12.00 the following day.

The Fatigue Index (FI) and Risk Index (RI) calculations show that this work pattern does not exceed the benchmarks of "35" for the daytime working or "45" for Fatigue (on night shift working) and "1.6" for Risk Index.

Annex F2

Network maintenance employee normally working nights, where the operative may have stayed up all day (Sun, Mon) and then turn up to work on the Monday evening for a sequence of five nightshifts.

Note: The hours shown in tables are “actual hours on site”. The HSE Calculator has added 1 hour travel to and from site, work undertaken is also not classed as significant risk work.

Day	Start	Finish	FI	RI
Mon	20:30	05:30	28.18	0.87
Tues	20:30	05:30	29.88	0.97
Wed	20:30	05:30	33.37	1.08
Thurs	20:30	05:30	36.65	1.19
Fri	20:30	05:30	39.14	1.29
Mon	20:30	05:30	29.62	0.99
Tues	20:30	05:30	33.04	1.10
Wed	20:30	05:30	36.38	1.20
Thurs	20:30	05:30	38.94	1.31
Fri	20:30	05:30	40.81	1.42
Mon	20:30	05:30	29.99	1.02
Tues	20:30	05:30	33.49	1.13
Wed	20:30	05:30	36.74	1.24
Thurs	20:30	05:30	39.21	1.34
Fri	20:30	05:30	41.01	1.45
Mon	20:30	05:30	30.04	1.03
Tues	20:30	05:30	33.55	1.14
Wed	20:30	05:30	36.79	1.25
Thurs	20:30	05:30	39.24	1.35
Fri	20:30	05:30	41.03	1.46

Scenario 2 Example 1.

The maintenance employee generally working night shifts Monday to Friday (20:30 – 05:30).

In this example (using the previously noted default settings for HSE Tool) the employee is fully compliant with expectations provided in IAN 189/16.

Annex F3

Network maintenance employee normally working nights, attending a road accident (with Emergency Traffic Management) at night.

Note: The hours shown in tables are “actual hours on site”. The HSE Calculator has added 1 hour travel to and from site, work undertaken is also not classed as significant risk work.

Day	Start	Finish	FI	RI
Mon	20:30	05:30	28.18	0.87
Tues	20:30	05:30	29.88	0.97
Wed	20:30	05:30	33.37	1.08
Thurs	20:30	05:30	36.65	1.19
Fri	20:30	05:30	39.14	1.29
Mon	20:30	05:30	29.62	0.99
Tues	20:30	05:30	33.04	1.10
Wed	20:30	05:30	36.38	1.20
Thurs	20:30	05:30	38.94	1.31
Fri	20:30	05:30	40.81	1.42
Mon	20:30	05:30	29.99	1.02
Tues	20:30	05:30	33.49	1.13
Wed	20:30	05:30	36.74	1.24
Thurs	20:30	05:30	39.21	1.34
Fri	20:30	05:30	41.01	1.45
Mon	20:30	05:30	30.04	1.03
Tues	20:30	05:30	33.55	1.14
Wed	20:30	05:30	36.79	1.25
Thurs	20:30	05:30	39.24	1.35
Fri	20:30	05:30	41.03	1.46

Scenario 3 Example 1.

As in Scenario 2 Example 1 on page 21 (Annex F2), the maintenance employee is working night shifts Monday to Friday (20:30 – 05:30).

In this example (using the previously noted default settings for HSE Tool) the employee is fully compliant with expectations provided in IAN 189/16.

Day	Start	Finish	FI	RI
Mon	20:30	05:30	28.18	0.87
Tues	20:30	05:30	29.88	0.97
Wed	20:30	05:30	33.37	1.08
Thurs	20:30	05:30	36.65	1.19
Fri	20:30	05:30	39.14	1.29
Mon	20:30	05:30	29.62	0.99
Tues	20:30	05:30	33.04	1.10
Wed	20:30	05:30	36.38	1.20
Thurs	20:30	05:30	38.94	1.31
Fri	20:30	08:30	51.55	1.68
Mon	20:30	05:30	30.32	1.05
Tues	20:30	05:30	33.87	1.15
Wed	20:30	05:30	37.05	1.26
Thurs	20:30	05:30	39.43	1.37
Fri	20:30	05:30	41.17	1.47
Mon	20:30	05:30	30.07	1.04
Tues	20:30	05:30	33.60	1.15
Wed	20:30	05:30	36.82	1.25
Thurs	20:30	05:30	39.27	1.36
Fri	20:30	05:30	41.05	1.47

Scenario 3 Example 2.

In this example, we have identified a potential issue where the employee has had to work additional hours on the Friday (highlighted in yellow) due to an unplanned incident.

Generally, the employee would normally work their planned hours, however, we are assuming here that for some reason the employee has had to remain at work.

The employee is shown as working 12 hours from 20.30 until 08.30 and as a result both the calculated Fatigue and Risk Indexes have been exceeded, "45" and "1.6" respectively.

As this is an unplanned event, it would be expected that an "Extension of hours risk assessment" (an example of which is included at Annex B) will be completed by the appropriate person which may be a supervisor or Senior Manager.

Day	Start	Finish	FI	RI
Mon	20:30	05:30	28.18	0.87
Tues	20:30	05:30	29.88	0.97
Wed	20:30	05:30	33.37	1.08
Thurs	20:30	05:30	36.65	1.19
Fri	20:30	05:30	39.14	1.29
Mon	20:30	05:30	29.62	0.99
Tues	20:30	05:30	33.04	1.10
Wed	20:30	05:30	36.38	1.20
Thurs	20:30	05:30	38.94	1.31
Fri	20:30	06:30	44.78	1.49
Mon	20:30	05:30	30.10	1.05
Tues	20:30	05:30	33.61	1.15
Wed	20:30	05:30	36.84	1.26
Thurs	20:30	05:30	39.28	1.37
Fri	20:30	05:30	41.06	1.47
Mon	20:30	05:30	30.05	1.04
Tues	20:30	05:30	33.56	1.15
Wed	20:30	05:30	36.80	1.25
Thurs	20:30	05:30	39.25	1.36
Fri	20:30	05:30	41.04	1.47

Scenario 3 Example 3.

Using Scenario 3 Example 2 at the bottom of page 22: if this was not an unplanned event, but a planned event which necessitated the employee being required to work longer than his / her normal 20.30 – 05.30 shift, the HSE Tool calculations show that a maximum of 1 additional hour could be planned for the Friday highlighted without exceeding the Fatigue or Risk Index benchmarks.

Annex F4

Supervisor / Manager normally working nights, attending a daytime meeting on a Thursday.

Note: The hours shown in tables are “actual hours on site”. The HSE Calculator has added 1 hour travel to and from site, work undertaken is also not classed as significant risk work.

Day	Start	Finish	FI	RI
Mon	20:30	05:30	28.18	0.87
Tues	20:30	05:30	29.88	0.97
Wed	20:30	05:30	33.37	1.08
Thurs	20:30	05:30	36.65	1.19
Fri	20:30	05:30	39.14	1.29
Mon	20:30	05:30	29.62	0.99
Tues	20:30	05:30	33.04	1.10
Wed	20:30	05:30	36.38	1.20
Thurs	20:30	05:30	38.94	1.31
Fri	20:30	05:30	40.81	1.42
Mon	20:30	05:30	29.99	1.02
Tues	20:30	05:30	33.49	1.13
Wed	20:30	05:30	36.74	1.24
Thurs	20:30	05:30	39.21	1.34
Fri	20:30	05:30	41.01	1.45
Mon	20:30	05:30	30.04	1.03
Tues	20:30	05:30	33.55	1.14
Wed	20:30	05:30	36.79	1.25
Thurs	20:30	05:30	39.24	1.35
Fri	20:30	05:30	41.03	1.46

Scenario 4 Example 1.

As in Scenario 2 Example 1 on page 21 (Annex F2) the supervisor/manager is working night shifts Monday to Friday (20:30 – 05:30).

In this example (using the previously noted default settings for HSE Tool) the employee is fully compliant with expectations provided in IAN 189/16.

Day	Start	Finish	FI	RI
Mon	20:30	05:30	28.18	0.87
Tues	20:30	05:30	29.88	0.97
Wed	20:30	05:30	33.37	1.08
Thurs	20:30	08:30	48.15	1.40
Fri	20:30	05:30	40.39	1.29
Mon	20:30	05:30	29.89	0.99
Tues	20:30	05:30	33.37	1.09
Wed	20:30	05:30	36.64	1.20
Thurs	20:30	05:30	39.14	1.31
Fri	20:30	05:30	40.96	1.41
Mon	20:30	05:30	30.02	1.02
Tues	20:30	05:30	33.53	1.13
Wed	20:30	05:30	36.77	1.24
Thurs	20:30	05:30	39.23	1.34
Fri	20:30	05:30	41.03	1.45
Mon	20:30	05:30	30.04	1.03
Tues	20:30	05:30	33.55	1.14
Wed	20:30	05:30	36.79	1.25
Thurs	20:30	05:30	39.24	1.35
Fri	20:30	05:30	41.03	1.46

Scenario 4 Example 2.

The supervisor/manager is looking to extend their working day to a maximum of 12 hours to attend an early meeting on Thursday.

As can be seen, the HSE Tool calculation shows that the supervisor/manager would exceed the Fatigue Index.

However, reducing this shift to 11 hours (say by starting 1 hour later) instead of 12 hours would provide a Fatigue Calculation of 44.7 which is acceptable.

As a result there are a number of alternative potential solutions to consider, to allow attendance at a daytime meeting on the Thursday.

A further solution is shown in Scenario 4 Example 3 on page 25.

Day	Start	Finish	FI	RI
Mon	20:30	05:30	33.11	0.89
Tues	20:30	05:30	34.70	1.00
Wed	20:30	00:30	13.97	1.07
Thurs	12:30	00:30	21.03	1.36
Fri	19:30	05:30	37.28	1.37
Mon	20:30	05:30	33.43	1.00
Tues	20:30	05:30	35.90	1.11
Wed	20:30	00:30	15.53	1.18
Thurs	12:30	00:30	22.47	1.49
Fri	19:30	05:30	37.69	1.50
Mon	20:30	05:30	33.47	1.04
Tues	20:30	05:30	36.00	1.15
Wed	20:30	00:30	15.66	1.22
Thurs	12:30	00:30	22.58	1.53
Fri	19:30	05:30	37.72	1.53
Mon	20:30	05:30	33.47	1.05
Tues	20:30	05:30	36.00	1.15
Wed	20:30	00:30	15.67	1.22
Thurs	12:30	00:30	22.59	1.54
Fri	19:30	05:30	37.72	1.54

Scenario 4 Example 3.

In this example, the supervisor/manager is to attend a Thursday afternoon meeting.

The supervisor would need to finish his Wednesday night shift at 00.30 to allow 12 hours rest before returning on Thursday afternoon at 12.30. The supervisor/manager could then work a 12 hour shift followed by a longer Friday shift to fulfil his weekly hour allocation.

Annex F5

Network maintenance employee in severe weather conditions lasting more than 8 hours, e.g. snow ploughing or dealing with major flooding.

(Note: The hours shown in tables are “actual hours on site”. The HSE Calculator has added 1 hour travel to and from site).

Day	Start	Finish	FI	RI
Mon	07:00	16:00	1.84	0.74
Tues	07:00	16:00	3.48	0.78
Wed	07:00	16:00	5.99	0.82
Thurs	07:00	16:00	8.71	0.86
Fri	07:00	16:00	11.17	0.90
Mon	07:00	16:00	2.98	0.76
Tues	07:00	16:00	5.32	0.80
Wed	07:00	16:00	8.05	0.84
Thurs	07:00	16:00	10.59	0.88
Fri	07:00	16:00	12.75	0.91
Mon	07:00	16:00	3.18	0.76
Tues	07:00	16:00	5.59	0.80
Wed	07:00	16:00	8.32	0.84
Thurs	07:00	16:00	10.82	0.88
Fri	07:00	16:00	12.94	0.92
Mon	07:00	16:00	3.21	0.76
Tues	07:00	16:00	5.63	0.80
Wed	07:00	16:00	8.36	0.84
Thurs	07:00	16:00	10.86	0.88
Fri	07:00	16:00	12.96	0.92

Scenario 5 Example 1.

This Network Maintenance employee is working a 07.00 – 16.00 midweek day shift pattern.

Both the Risk Index and Fatigue Index are well within the 1.6 and 35 respective benchmarks. (Note the Fatigue Index is “35” for day time working and “45” for night time working)

Day	Start	Finish	FI	RI
Mon	07:00	16:00	1.84	0.74
Tues	07:00	16:00	3.48	0.78
Wed	07:00	16:00	5.99	0.82
Thurs	07:00	16:00	8.71	0.86
Fri	07:00	16:00	11.17	0.90
Mon	07:00	19:30	4.74	0.98
Tues	07:00	19:30	7.12	1.03
Wed	07:00	19:30	10.37	1.08
Thurs	07:00	19:30	13.33	1.13
Fri	07:00	19:30	15.76	1.18
Mon	07:00	16:00	4.19	0.76
Tues	07:00	16:00	6.84	0.80
Wed	07:00	16:00	9.51	0.84
Thurs	07:00	16:00	11.84	0.88
Fri	07:00	16:00	13.78	0.92
Mon	07:00	16:00	3.32	0.76
Tues	07:00	16:00	5.78	0.80
Wed	07:00	16:00	8.50	0.84
Thurs	07:00	16:00	10.99	0.88
Fri	07:00	16:00	13.07	0.92

Scenario 5 Example 2.

This example is to demonstrate that a Network Maintenance employee is able to work extended hours to cover extreme conditions such as snow ploughing or flooding.

The Network Maintenance employee is shown as having to work a full week of 12 hour day shifts for the extreme conditions.

Both the Risk Index and Fatigue Index are still within the 1.6 and 35 respective benchmarks. (Note the Fatigue Index is "35" for day time working and "45" for night time working)

NOTE:

A Network Maintenance employee working on the night shift roster would need to follow the example shown in Annex F3 for any additional hours required for the extreme conditions.