

Fatigue management overview

Fatigue management plans should follow the 7 step process set out in the Crossrail Fatigue Plan CRL1-XRL-Z7-STP-CR001-50005. The following document provides an overview of the steps and good practice that should be adopted.

1. Identify employees who fall into the applicability of this plan

Fatigue management arrangements should be put into place for all shift workers, which include, rotating, nights and early shifts. General advice and monitoring should be put into place for all other staff.

2. Define and risk assess the proposed working pattern

Assessment of risk should not be limited to the use of the HSE fatigue risk indicator (best for rotating shift patterns) but should include roster comparison, data from research, industry comparisons and other good practice.

Good practice in shift design and management is as follows:

- An uninterrupted break of a minimum of 1 day (24 hours) in each seven day period or an uninterrupted break of 2 days (48 hours) in each 14 day period
- Minimum rest period between shifts of 12 hours or 14 hours for consecutive nights
- Not more than 12 hours per day shift or 10 hours per night or early shift (travel time limited to maximum of 1 hour door to door)
- First night shift no more than 8 hours
- Not more than 60 hours per week
- At least two consecutive days rest from day to night shift
- One uninterrupted rest break of 20 minutes is working over 6 hours and two rest breaks if working 12 hours
- Restrict long shifts to five consecutive shifts and avoid weekly shift changes
- Rotating shift patterns are forward- rotating
- Overtime not to exceed 2hrs past usual shift working hours

When using the HSE Fatigue risk index, shift rosters should not exceed the following:

- Fatigue index
 - Day shift – 35
 - Night shift – 45
- Risk index – 2.0
- Defaults to be selected for workload and attention, as appropriate

Other factors that should be included in the risk assessment process include:

- Work activities – avoid scheduling demanding, dangerous, monotonous during the night, early morning, towards the end of long shifts and during other periods of low alertness without adequate supervision and reporting arrangements in place
- Working practices – manage overtime, annual leave, rostering, supervision and absences and monitor excessive hours
- Working environment – temperature, noise and vibration, lighting, welfare, work demands and level of comfort

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3. Health assessment

There is a legal requirement to offer night workers a health assessment to ensure that the worker does not have a medical condition that may be adversely affected by night work i.e. those that require regular medication.

An appropriate health assessment should be provided for all shift workers to determine if the workers have sleep related health disorder or long term health conditions. Fitness for work (health status, sleep quality and home environment) also need to be managed and mitigated.

4. Provision of information and training

Training is considered an important control measure in the management of risk and should be suitable and sufficient to inform, educate and change behaviours.

The training programme should be targeted to the audience ie worker, supervisor, shift designer, health and safety risk assessor. Refresher training should be conducted annually and be part of start of shift briefings.

5. Monitoring of arrangements

Personal monitoring of fatigue risk should be conducted after the first month of starting shiftwork or a new shiftwork pattern and three monthly thereafter, via a questionnaire.

Ongoing monitoring should be conducted onsite if supervisors are concerned about a workers performance and risk of fatigue, via an individual risk assessment.

6. Action following an incident or concern raised

Fatigue should be considered a possible contributory factor in all incidents, with referral to occupational health as appropriate.

Fatigue indicators to include: time of incident, number of days into shift pattern, number of hours into shift, number of rest days in previous 14 day period, rest in previous 24 hours, amount of sleep in previous 72 hours, work activity, commute time.

7. Management review

The plan should be developed with all stakeholders and reviewed annually.

A set of fatigue risk tables are provided to demonstrate the different levels of risk for each of the risk factors: working hours, work activity, work environment, work practices, fitness for work, sleep and non work factors.

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Appendix 1 – risk tables

Working Hours

Normal – Usual Working hours	Extended Hours	Abnormal Hours	Emergency hours
<ul style="list-style-type: none"> Working up to 48 Hours mean average over a rolling 17-week period. Choice and control over work hours Shift work <ul style="list-style-type: none"> Timing – forward rotating, rest breaks, 12 hours rest, recovery evening shift Length – Maximum 16 hours awake, 60 hours/week Type - physically and mentally strenuous, Monotonous 2-3 shifts over 10 hours 	<ul style="list-style-type: none"> >2hrs past usual daily working hours Planned hours of 12 hours per day or 10 hours per night or early shift Maximum hours in seven day period 60 hours Less that 12 hours rest in any 24 hours for day shifts Less than 2 days rest after a block of consecutive nights or early shifts First night shift >8 hours More than 4 consecutive 12 hour days shifts or consecutive night shifts over 10 hours 12 hours minimum rest between shifts or 14 hours for consecutive nights. 	<ul style="list-style-type: none"> Working >4hrs past usual working hours Working 12 hours per shift (including overtime and working from home) Maximum weekly hours 70 More than thirteen shifts in fourteen day period Less than 14 hours rest in any 24 hour period for night shifts Less that 12 hours rest in any 24 hours for day shifts Only one days rest after night shifts Backward rotating shift pattern More than 6 consecutive night or early shifts in a permanent patterns Commute over 1.5 hours 	<ul style="list-style-type: none"> >14 hours working (including travel) Maximum weekly hours 72 hours Successive shift start times vary by more than 2 hours

Work environment

Normal working conditions	Moderate working conditions	Severe working conditions	Harsh working condition
<ul style="list-style-type: none"> No extreme temperatures Ambient noise and no detectable vibration Lighting appropriate for task Ergonomic workstation set up Easy access to welfare facilities 	<ul style="list-style-type: none"> Dim lighting/artificial lighting Work related driving, operation of equipment Seating providing high degree of comfort Access to welfare facilities periodically 	<ul style="list-style-type: none"> Poor lighting Extreme temperatures Wet conditions with limited changing facilities Whole body vibration Extreme noise 	<ul style="list-style-type: none"> Severe working conditions compounded by the requirements for: <ul style="list-style-type: none"> Vigilance & monitoring Decision making Awareness Fast reaction time Tracking ability Memory

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Work activities

Normal - demands	Increase demands	Abnormal demands	Excessive demands
<ul style="list-style-type: none"> • Workload -extremely undemanding, lots of spare capacity • Continuous attention – rarely, nearly none of the time • Ability to take regular breaks in well-lit area with access to water. 	<ul style="list-style-type: none"> • Workload - Moderately undemanding, some spare capacity • Continuous attention – some of the time • Rest breaks (20 minutes uninterrupted if working over 6 hours) • Safety critical/business critical 	<ul style="list-style-type: none"> • Workload – moderately demanding – little spare capacity • Continuous attention – most of the time • Safety critical/business critical work between 2pm -4pm or 1am-3am • Monotonous, repetitive, physically and mentally demanding • Unplanned work 	<ul style="list-style-type: none"> • Workload – extremely demanding, no spare capacity • Continuous attention – all or nearly all of the time • Unrealistic time constraints • Lack of resources

Working practices - controls

Normal – Usual Working hours	Moderate control	Limited control	Poor control
<ul style="list-style-type: none"> • Limited overtime • Absence managed and workload reviewed • Monitor excessive hours • Leave taken regularly • Protocol in place and followed for roster changes • Regular training and supervision 	<ul style="list-style-type: none"> • Occasional overtime, under 2 hours per shift to cover increased workload and unplanned leave • Absence managed with short term increase in demand • Excessive hours monitored with minimal consequences • Leave taken on block • Roster changes made infrequently • One-off training • Supervision for high risk activities 	<ul style="list-style-type: none"> • Regular overtime, under 2 hours per shift • Absence not managed and demand increased • Excessive hours monitored with no consequences • Roster changes made regularly • Limited training and supervision 	<ul style="list-style-type: none"> • Regular overtime, exceeding 2 hour per shift for workload demands and emergencies • Leave not taken • No supervision or training

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Fitness for work

Normal – health management	Moderate impact	Increasing impact	High impact
<ul style="list-style-type: none"> Regular health assessment for night workers and shift workers to monitor for sleep related disorders i.e. shiftwork sleep disorder, insomnia, sleep apnoea Health assessment includes monitoring of potential long term health effects ie digestive problems, heart disease, stress and mental illness Balanced diet and good hydration by staff Lifestyle risk management by staff ie drugs, alcohol, smoking and exercise 	<ul style="list-style-type: none"> Health assessment for night workers only with general health assessment for shift workers Sleep related health condition, well managed Limited access to healthy eating options and fluids Occasional use of stimulants (caffeine, smoking) or sedatives (sleeping tablets) New to shiftwork 	<ul style="list-style-type: none"> Previous health assessment – not shift work specific Newly diagnosed health condition Poor diet and occasional dehydration Regular use of stimulants or sedatives No regular exercise 	<ul style="list-style-type: none"> Sedentary role and lifestyle No health assessment Undiagnosed sleep related health condition Long term health condition not managed

Sleep – quality and quantity

Healthy sleep	Moderate sleep	Unhealthy sleep	Poor sleep
<ul style="list-style-type: none"> Regularly sleep 7 or more hours a night Fall asleep within 10 minutes No extended periods of wakefulness Slept 2-3 hours before night shift Total sleep in 24 hours of 7-9 hours 	<ul style="list-style-type: none"> Sleep 4-7 hours a night Less than 6 hours in previous 24 hour period Take more than 30 minutes to fall asleep Occasional periods of wakefulness Had a rest before work Healthy naps of 20-30 minutes 	<ul style="list-style-type: none"> Sleep 4-7 hours a night Less than 12 hours sleep in previous 48 hours Awake for over 16 hours Difficulty falling and staying asleep, waking tired Stress affecting quality of sleep most nights Unhealthy napping of 2-3 hours on day shift or days off 	<ul style="list-style-type: none"> Sleep less than 4 hours a night No napping

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Non work related factors

Normal	Moderate impact	Increasing impact	High impact
<ul style="list-style-type: none"> Minimal disturbance from family, friends and neighbours No social commitments impacting on sleep opportunity Relax ready for sleep Bedroom prepared for good sleep 	<ul style="list-style-type: none"> Occasional disturbance from family, friends and neighbours Occasional social commitments impacting on sleep opportunity No bedtime routine Bedroom too light, noisy or hot/cold and bed not comfortable Long commute to work – public transport 	<ul style="list-style-type: none"> Living in multiple occupancy accommodation Numerous family and social commitments Strenuous exercise or large meal within 2 hours of sleep Driving home at end of shift patterns (lodgings during shift patterns) 	<ul style="list-style-type: none"> Poor relationship with neighbour Driving home after shifts/night work

Learning Legacy Document

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Appendix 2 - Standards

<p>Working time regulations: No more than 48 hours a week averaged over a 17 week period A minimum daily rest period of 11 consecutive hours A minimum weekly rest period of 24 or 48 consecutive hours averaged over 14 days A minimum of 20 minutes rest in any work period of more than 6 hours A maximum of 8 hours night work every 24 hours averaged over a 17 week period Free health assessment for night workers Paid annual leave of at least 4 weeks</p>	<p>Rail standards: An uninterrupted break of a minimum of 1 day (24 hours) in each seven-day period or an uninterrupted break of 2 days (48 hours) in each 14 day period A maximum of 14 hours worker per employee (including door to door travel) in any one shift. A minimum rest period of 12 hours, at place of rest, between shifts. A maximum of a 72-hour working week</p>
<p>Young workers (WTR): A limit of eight hours working day and 40 hours a week A rest period of 30 minutes minimum if they work four and a half hours An uninterrupted break of a minimum of 12 hours between shifts An uninterrupted break of 2 days (48 hours) every seven days, normally two consecutive days. Young workers non-permitted to work nights</p>	<p>Crossrail: Not work more than 7 consecutive days Minimum rest period between shifts of 11 hours When working night shifts or early morning shifts which are 10 -12 hours then a minimum of 3 days rest after 7 consecutive shifts worked At least two consecutive days rest from day to night shift Rotating shift patterns are forward- rotating</p>