



A Guide to investigating fatigue

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Fatigue Investigation

Actions to be taken when investigating fatigue or in response to a Report of Fatigue

These notes are to assist with investigating fatigue either as part of an investigation into an incident and accident or in response to a report of fatigue (as per Operations Manual procedure NR/L3/OCS/041/2-02 Control Of Excessive Working Hours For Persons Undertaking Safety Critical Work).

There are a number of key data collection steps which will help you build up a picture of the underlying fatigue issues and to support you in any decisions about the degree of the fatigue risk.

The steps are as follows:

- Step 1: Assess real time fatigue risk and agree initial fatigue mitigations
- Step 2: Check compliance with working time limits
- Step 3: Calculate Fatigue and Risk Index score using the last 21 days of individual (s) roster pattern
- Step 4: Identify underlying fatigue factors

Step 1: Assess real time fatigue risk

To establish what the likely fatigue risk was/is at a particular point of time (i.e., on the day of an incident or at the point at which a report of fatigue is being made) the following questions can be used to build up a picture about the individuals hours of wakefulness and the quality of their sleep. Then use the sleep risk assessment as a guide as to whether the individual is at risk of fatigue.

- How long have you been awake? (Note: individuals who have been awake or will have been awake for more than 17 hours prior to or during their shift are at significant fatigue risk)
- How much sleep have you had in the last 3 days (72 hours)? As a rule of thumb, individuals who have had less than 18 hours sleep in the last 72 hours are at significant fatigue risk)
- Describe the quality of the sleep that you have had in the rest period immediately prior to the shift which you are reporting fatigued for
- When working comparable shifts (e.g. late, rest, early) what is your usual sleep pattern? Has your sleep pattern today (i.e., the day of the report) been typical for that shift type?
- Do you typically have difficulties sleeping? If so, when does this occur?
- Are there any particular shifts (or changes from one shift to another) that you find difficult to sleep or you experience increased tiredness?

- Describe what steps you have taken to address the lack of sleep (i.e., have you had the opportunity for naps?)
- Have you eaten appropriately in the last 4 hours?
- Is there an underlying health issue that is leading to the lack of/poor quality sleep?

If you are responding to a report of fatigue then other factors that must be taken into account when deciding whether the individual is fit for work are:

- The time of day of the shift – for example it is known that night shifts carry with them greater fatigue risk.
- The level of additional supervision that can be provided
- Type of work being undertaken and whether it involves significant mental or physical exertion
- The individuals travel time to work and whether it is more than an hour's drive

		Amount of sleep		
		Little to no sleep	Some sleep	Normal amount of sleep
Quality of sleep	Poor	Red	Red	Amber
	Average	Amber	Amber	Green
	Good	Amber	Green	Green

	Employee at significant risk from fatigue at work and additional steps should be taken to mitigate and reduce the risk
	Employee is at moderate risk from fatigue at work and may benefit from additional mitigations
	Employee is at low risk from fatigue and fit for duty

As a general guide:

little of no sleep = less than 4 hours

some sleep = 4 – 6 hours

normal amount of sleep 7+ hours

If the amount of sleep has been regularly interrupted then this should be rated as poor; sleep where you have been woken once or twice should be regarded as average and good quality sleep is uninterrupted.

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Report of Fatigue

These questions and the sleep risk assessment should help you decide with the individual whether they are fit to come on duty. If the assessment is that they are but with additional mitigations, those mitigations may include:

- More regular short rest breaks
- Additional supervision to monitor for signs of tiredness
- Additional supervision to provide checks in work
- Alternative arrangements for travel to and from work (so the individual is not driving)

Step 2: Check compliance with working time limits

The company's working time limits are detailed in NR/ L2/ERG/003 Management of Fatigue and Working Hours for Staff Undertaking Safety Critical Work. They are:

- No more than twelve hours to be worked per period of duty/shift
- No more than seventy two hours to be worked in any seven day period
- A minimum of twelve hours rest between booking off from a period of duty/shift to booking on for the next period of duty/shift
- No more than thirteen periods of duty to be worked in any fourteen day period

Consider if the shift that the individual is reporting fatigue would mean a working time exceedance or if the individual has worked more than 60 hours in the last 7 days.

Step 3: Calculate Fatigue and Risk Index score

The [FRI](#) and the [FRI User Guide](#) are available on Connect and outline how to input and interpret the data.

Before you begin entering data about the last 21 days you will require:

- The date, start and finish time for each shift
- If any rest breaks were taken and details of typically when and for how long the rest breaks are
- The individual's typical commute to work
- Information about the type of work being undertaken and whether it was

The FRI score of the day of the incident or report will give you information about the likely level of fatigue at the time, rather than considering the overall or average score.

The FRI score on the day is to be used in conjunction with your assessment from step 1 and not in isolation.

Step 4: Identify underlying fatigue factors

The following factors and associated questions are by no means exhaustive, but they will help you with identifying some of the underlying reasons for the fatigue identified in Steps 1 -3.

Quality of Sleep

See Step 1 above: You are looking to understand if there are issues with the quality of sleep the individual gets and what strategies, if any, they may for managing this.

- Do you typically have difficulties sleeping? If so, when does this occur?
- Are there any particular shifts (or changes from one shift to another) that you find difficult to sleep or you experience increased tiredness?
- Describe what steps you normally take to address the lack of sleep (i.e., do you take naps?)
- Is there an underlying health issue that is leading to the lack of/poor quality sleep?
- Is there an underlying personal/domestic reason that is leading to lack of or poor quality sleep?

Journey to work

You are looking to see whether the journey to work took more than hour as this is known to contribute to fatigue and also how the individual is travelling: whether by car or public transport for example.

Duration and quality of the rest periods

- Are the rest periods between shifts adequate? (See Step 2)
- What impact does the travel time have on the rest period?
- Are there adequate rest breaks during the shift? (There should be a minimum of 20 mins for every 6 hours worked as per the Working Time Regulations. There are exemptions to this in Operations and reference should be made to the Guidance on Rest Breaks document available through Connect.
- How are the rest periods between shifts being utilised – what are the individual's non work activities?
- Have the rest periods been impacted on as a result of on call activities?
- Have the rest periods been impact on as a result of working overtime?

Work practices

- What are the on call arrangements?
- Does the work pattern follow good practice (i.e., was it a fatigue friendly roster?)
- How different are the actual hours vs planned hours? What is the cause for any difference?
- Is working overtime the norm?
- What notice was given to the individual of the work schedule?
- Was there any shift swapping? What is the policy regarding shift swapping?

Nature of the work

- Was the nature of the work physically demanding?
- Was the work demanding in terms of attention resources, for example did it involve long periods of continuous driving, did it involve remaining vigilant for more than 2 hours at a time (for example when acting as a Lookout)?

Work environment

Were there any sources of discomfort in the work environment? (e.g. dust, noise, heat, vibration). Such uncomfortable conditions can lead to discomfort and pre-occupation which is fatiguing.

Individual Factors

- Did the individual have any health or sleep disorders?
- Had the individual had an extended period off from work?
- Has the individual reported fatigue previously and if so what were the results of that investigation?
- Had the individual been trained or provided guidance on coping with shift work or fatigue? What did it consist of?

Supervision and Management

- What are the fatigue reporting arrangements?
- Was the manager aware of any exceedances? What were their arrangements for monitoring the exceedances and fatigue risk?
- To what extent is there contingency in the roster?
- What are the arrangements for managing vacancies to ensure the fatigue risk is managed?

The factors are to be used to supplement the [10 Incident Factors](#) that form part of the accident investigation process.