

**FATIGUE MANAGEMENT**

▾ *For Work Boats*



▾ *Get your sleep*  
Reduce your risk

# ▶ *GUIDE TO FATIGUE MANAGEMENT FOR WORK BOATS*

## Introduction

This sector guide is for vessel owners and operators. It contains:

- examples of a fatigue management plan
- common causes of fatigue on work boats and what to do about them
- legal obligations
- Maritime New Zealand recommendations
- how to write a fatigue management plan
- documenting steps for audit.

**Caution.** The Health and Safety in Employment Act 1992 requires employers to have effective methods for identifying and assessing hazards at work. Hazards include situations resulting from physical or mental fatigue. This guide lists situations that others in your industry have identified as resulting in fatigue.

Use as a starting point the list of fatigue hazards and how they can be managed. Not all will apply to you, and you may have additional problems not identified here.

Using the list of hazards in this guide does not remove your obligation to identify all hazards. Every vessel and crew are different and will have their own problems with fatigue and solutions for them.

## EXAMPLE OF A FATIGUE MANAGEMENT PLAN

### About the company

Stone Towing is operated by Rangi and Gaye Stone. Most of their work involves carrying roading metal to remote locations, though a variety of other loads are also carried. The company employs a deckhand (Bill). Rangi and Bill operate the tug and barge; Gaye does the paperwork and provisioning.

They were aware that at the end of busy times Rangi and Bill were very run down. Gaye had noticed that repairs to the barge and tug increased toward the end of busy contracts.

They operate in a competitive environment with considerable pressure to deliver on time.

### How they went about it

The SSM company arranged a training session on fatigue. Another company with two workboats was there, as well as a water taxi operator. The SSM advisor made a half-hour presentation on fatigue. He then got each operator to list all the things that led to fatigue in their operation. After this there was a general discussion about whether each list was complete and what were the most important things to concentrate on. After that there was a general brainstorm about how each fatigue risk could be managed.

Rangi and Gaye found it useful to discover that others had similar problems. Overall, everyone felt that they got something useful out of the session. Over the next 2 weeks Rangi and Gaye (with comments from Bill) wrote a draft of their fatigue management plan. The SSM advisor was impressed with their efforts and suggested that they try it out for a couple of months, to see how realistic it was. After 2 months Rangi, Gaye, Bill and the SSM advisor met and went over how everything had gone. After some minor changes the result was written into the SSM manual.

In developing their plan, Rangi and Gaye used the *Guide to fatigue management for work boats* to help them shape their ideas. Their SSM company had explained that not everything in the guide would apply to them, as it was developed to cover a range of vessel operations. They might also have problems and/or solutions that aren't in the guide. The important thing was to develop an approach that worked for their vessel to manage the risk around fatigue effectively.

### Their plan

#### Rangi and Gaye's expectations

Rangi and Bill should not be working when they are likely to be making mistakes because of fatigue.

#### Significant hazards

Significant hazards are listed in the table following, along with a plan to eliminate, isolate or minimise them.

FATIGUE HAZARDS	MEASURE TO ELIMINATE/ISOLATE OR MINIMISE	MANAGEMENT ACTION TO SUPPORT THE MEASURE
<b>Rangi works long hours when at sea</b>	Train Bill to take a watch so Rangi gets a break.	Assist Bill to get the certificated deckhand qualification.
<b>Cumulative fatigue develops due to:</b> <ul style="list-style-type: none"> <li>• sleeping in short blocks</li> <li>• early starts, which mean cutting sleep short</li> <li>• total sleep per 24 hours is a lot less than when not working</li> <li>• working many days in a row</li> <li>• noise and vibration.</li> </ul>	<p>Set limits on the number of days worked where fatigue cumulates to high levels.</p> <p>Employ another crew on a part-time basis who can work when Rangi and Bill need a break or are sick.</p> <p>Crew to nap when opportunities allow.</p>	<p>Plan when days off are required so the crew can recover from cumulative fatigue (with 2 full nights available for sleep).</p> <p>Encourage napping.</p>
<b>Often working without breaks</b>	<p>Have a 10 minute break at least once every 3 hours.</p> <p>Drink plenty of water and eat healthy snacks regularly.</p>	<p>Encourage breaks.</p> <p>Provide water bottles to help stop dehydration.</p> <p>Provide healthy snacks.</p>
<b>Delays to schedule due to contractors not being on time</b>	Where possible, address through contract provisions, so that late performance by the contractor does not put unreasonable pressure on Stone Towing.	Meet with contractors and discuss Health and Safety in Employment Act 1992 (HSE Act) issues.
<b>Tiredness during the day</b>	Crew to nap when opportunities allow.	<p>Rangi and Bill to discuss what is feasible on each trip and work period.</p> <p>Encourage napping.</p>
<b>Contracts have tight requirements for work to be done</b>	<p>Make sure estimates for doing the job are realistic.</p> <p>Include contingency provisions in contract for events out of Stone Towing control (such as bad weather).</p>	Discuss HSE Act obligations with contractors; and set up guidelines, especially for when there is pressure to do extra work.
<b>Heavy and wet weather makes tows longer and poor conditions for sleeping</b>	<p>Train Bill to take a watch so Rangi gets a break.</p> <p>Organise a break after a heavy weather tow.</p>	Assist Bill to get the certificated deckhand qualification.
<b>Sleeping conditions on board are poor</b>	Upgrade sleeping quarters.	Provide new mattress, blackout curtains, blanket and ear plugs.

**Training**

Arrange with the SSM company to have a fatigue training session. Combine with others who have workboats.

**Monitor and review**

Schedule a review at the end of the year to check how well fatigue was managed.

## COMMON CAUSES OF FATIGUE IN WORK BOATS AND WHAT TO DO ABOUT THEM

### Knowledge

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<b>Lack of knowledge by existing management or crew about fatigue</b>	People either don't know what to do or don't recognise it is a problem, unless they have been told about it.	Employers may not allocate resources or implement fatigue management. Crew don't know what to do or fail to manage their fatigue.	Everyone reads the <i>Understanding fatigue</i> brochure. Ask your SSM company to give a talk on fatigue management. (Doing this with others can cut the cost.)
<b>New crew</b>	Even experienced seafarers, if new to the vessel, will not know the policies and operating practices of the new vessel. Those new to seafaring may not be used to working long hours or rotating shifts, especially at night.	Lack of knowledge can lead to incorrect actions – or inaction.  May be more likely to go to sleep when on duty.	Use of proper induction procedures.  Monitor new crew members to see how they adapt to night work. Possibly start with shorter hours.

### Before sailing

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<b>Owner's expectations</b>	Can encourage unsafe work patterns/practices.	Can result in high levels of fatigue and often combines with high risk tasks, such as watchkeeping.	Owner to make expectations clear as to realistic maximum hours of work and when breaks should be taken. Monitors performance and gives feedback.

*continued...*

## > Knowledge

- > Everyone to read the *Understanding fatigue* brochure
- > Ask your SSM company to give a talk on fatigue management
- > Use proper induction procedures for new crew
- > Monitor new crew members – particularly for night work



Before sailing continued...

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<b>Contract management</b>	Contracts can impose demands that result in high levels of fatigue.	Seafarers and divers can become unnecessarily fatigued.	Discuss health and safety issues with contractors as part of developing the contract.  Anticipate what might go wrong and place undue pressure on the crew and divers. Build contingency options into the contract to mitigate negative effects.
<b>Crew not available</b>	Places additional demands on others.	Others can become fatigued, safety reduced.	Develop contingency plans prior to the situation happening. Consider cancelling services if necessary.
<b>Crew report in an unfit state to work</b>	Safety can be compromised if a seafarer is not fit to work.	The seafarer is liable to cause safety problems for him/herself and others.  Others cover for the unfit seafarer, pushing their own performance beyond safe limits.	Skipper to assess crew for fitness for duty when they report for work. (Employers are obliged to monitor for impairment, if it is an identified hazard that cannot be eliminated or isolated – HSE Act.)  Send home if unfit. Have standby staff available.  Sail and require recovery rest immediately, or after leaving enclosed waters.  Develop contingency plans prior to the situation happening.

## Sleep

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<p><b>Crew get little sleep when off duty at home, eg partying, young children in the house, second job</b></p>	<p>Short sleep, especially over several days, makes a person increasingly sleepy and their performance increasingly less reliable.</p>	<p>More prone to making mistakes and making poor safety decisions.</p> <p>Recovery at sea is unlikely and the accumulating effects of sleep loss may get considerably worse.</p>	<p>Include responsibility for crew to turn up fit for work, or notify skipper if they are not fit to work, in employment agreements. (Employees shall take all practicable steps to be safe at work – HSE Act.)</p> <p>Discuss fitness for duty responsibilities with crew. A good sleep the night prior to re-joining the boat should be a priority.</p> <p>Encourage the crew to share the brochure <i>Understanding fatigue</i> with their families.</p>
<p><b>Poor quality sleep on board</b></p>	<p>Poor quality sleep is caused by a number of factors, including:</p> <ul style="list-style-type: none"> <li>• uncomfortable bed</li> <li>• light. Natural light is a cue for waking up</li> <li>• motion/vibration</li> <li>• too hot/cold</li> <li>• alcohol (easy to fall asleep but sleep quality is reduced)</li> </ul>	<p>Poor quality sleep is not restorative. If opportunities to catch up on sleep are not available, cumulative fatigue can become a safety issue.</p> <p>More likely to make mistakes. Injury accidents becomes more likely, safety decisions more likely to be poorly made.</p>	<p>Fix sleeping environment, if it is a problem.</p> <p>Blackout curtains (possibly using Velcro) installed where possible.</p> <p>Encourage maximum use of breaks for sleep so time asleep is maximised.</p> <p>Purchase sleep masks for crew.</p> <p>Monitor sleep patterns over the work season.</p> <p>Have opportunity for at least 2 nights recovery sleep after each long trip, especially where cumulative fatigue is likely to be a problem.</p> <p>Encourage napping especially at natural sleep times (3.00 – 5.00 pm, after 10.00 pm).</p>

continued...

*Sleep continued...*

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<b>Noisy engine</b>	Hard to get to sleep, poor quality sleep.	Become fatigued as cannot effectively use rest time.	A difficult problem. Reducing engine noise/vibration is the best solution. Check if sound proofing can be added and do so if it can be. Some have found sleeping in the wheelhouse helps a little. Earplugs may also assist.
<b>Warm/high temperatures in sleeping quarters</b>	Makes falling sleep more difficult and sleep is more disturbed.	Increases fatigue.	See if ventilation can be installed safely – check with engineers. (Make sure you don't vent warm air into the wheelhouse.)
<b>Sleep problems (often evident in those over 50 years of age)</b>	Crew member cannot get restorative sleep so likely to be fatigued, even if given reasonable opportunities for rest and recovery.	More prone to making mistakes and making poor safety decisions.	Encourage crew to bring any problems forward. Encourage affected crew to discuss with their doctor. (See <a href="http://www.maritimenz.govt.nz">www.maritimenz.govt.nz</a> for a list of sleep clinics.)

## Working conditions

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<b>Adverse weather and night conditions</b>	Physically tiring (eg rough weather) Mentally demanding (eg fog)	Excessive fatigue develops across a normal working day.  Mentally demanding tasks can result in fatigue.	Relief from physical and mental fatigue is obtained by rest (breaks). Ensure there are breaks during the day, so fatigue has less chance to accumulate.  Work with crew to determine what results in fatigue, where breaks can be placed in the schedule and how long they should be to alleviate fatigue.
<b>Heat/cold</b>	Working in extreme temperatures (hot or cold) impairs performance and workers will not want to work as long.  People sleep better when the temperature is cooler.	If seafarers are working in extreme temperatures they will become fatigued (and their performance impaired) if they are required to work longer than their body can cope with naturally.  Moving from a hot inside to a cold outside.  Poor quality sleep, if the temperature is not right.	Work with employees to monitor the effects on their performance and fatigue levels. Investigate options for cooling/heating/ventilation on board. Ensure there are breaks during the day, so there are more opportunities to reduce stress on the body. When warm ensure there is a plentiful supply of drinking water available.  Wear layers of clothing, with the top layer being easy to remove.  Investigate options for cooling/heating/ventilation in sleeping areas.

continued...

Working conditions continued...

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<b>Long work days</b>	Short sleep. Cumulative fatigue. The sleep drive begins to increase rapidly after about 16 hours awake.	Commuting becomes high risk. More likely to make mistakes. Injury accidents becomes more likely, safety decisions more likely to be poorly made.	Employ sufficient staff to allow either shorter days or a smaller number of days worked continuously. Make sure that the number of days worked in a row does not allow fatigue to build unreasonably. Monitor work practices and fatigue levels. Encourage napping, especially at natural sleep times (3.00 – 5.00 pm, after 10.00 pm).
<b>Long hours with no breaks</b>	Fatigue accumulates with no chance to rest, refuel and recover.	Mistakes become more common, accidents more likely.	Examine work practice (especially when working under pressure) and develop a policy to provide a minimum number of breaks.
<b>Individuals who seek additional work</b>	Long work hours, insufficient time for rest.	High levels of fatigue after long hours/short rest periods. Cumulative fatigue.	Keep an up-to-date record of hours worked and monitor individuals who seek to work additional hours. Establish limits of how much work can be done within specified timeframes. Monitor for employees also working in other jobs, that result in them becoming a fatigue risk.

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<b>Wheel house environment</b>	<p>Heater on induces sleep.</p> <p>Wheelhouse chair is a comfortable place to be, especially when fatigued.</p>	<p>Watchkeeper falls asleep.</p> <p>Easy to fall asleep in.</p>	<p>Discuss with crew, address in company policy on watchkeeping.</p> <p>Encourage a flow of fresh air.</p> <p>Check on use of heater.</p> <p>Install a functional chair, not a comfortable chair. (While comfort is great, safety should be the main consideration.)</p> <p>Address as part of the watchkeeping policy – prohibit use of the chair in enclosed waters and on inward transits, unless its use increases safety.</p>
<b>Clothing</b>	<p>Inappropriate clothing can result in crew either being too hot or cold.</p>	<p>Crew become fatigued unnecessarily.</p>	<p>Wear three layers when conditions are cold:</p> <ul style="list-style-type: none"> <li>• synthetic next to the skin to take away moisture</li> <li>• wool or synthetic-pile for warmth</li> <li>• windproof material.</li> </ul> <p>Keep the head covered: it is where most heat is lost from.</p> <p>Wear layered socks and insulated boots to keep feet dry and warm.</p>
<b>Dehydration and running short of energy, especially working when it is hot</b>	<p>Will feel tired and it becomes difficult to perform at an effective level.</p>	<p>Mistakes become more common, accidents more likely.</p>	<p>Place water bottles where they are easy to grab. Encourage staff to use them regularly, especially when doing physical work in warm weather.</p> <p>Drinking little and often is better than having a large drink occasionally.</p>

## Diving

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<p><b>Working longer hours on “regular work” than usual, as it is hard physical work and the cold affects them</b></p> <p><b>Emergency work</b></p>	<p>Results in fatigue.</p>	<p>Mistakes and accidents more likely.</p>	<p>Keep to a maximum of a 12 hour day where possible and record hours of work.</p> <p>When working in the water, having a 20 minute break every 3 hours (depends on different depths and water temperature).</p> <p>If they have to work extra hours to the extent it affects them, taking off time to recover, rather than letting fatigue accumulate.</p> <p>If fatigue levels are high, postpone the job and get some sleep, either by going home for a few hours or napping on the job. Sleeping on the job is often best, as it minimises the risk from driving and gives more sleep time.</p> <p>Taking off 1 or 2 full days to recover, when the job is finished.</p>
<p><b>Working in cold water</b></p>			<p>Have appropriate diving suit available for the conditions.</p> <p>Have sufficient divers available to rotate them.</p>

## Other

FATIGUE HAZARD	WHAT MAKES IT A HAZARD?	WHAT IS THE SAFETY PROBLEM?	OPTIONS TO MANAGE IT
<b>Commuting</b>	Less time for sleep. Cumulative fatigue. Driving during the times of low alertness is particularly risky (at night up to about 6.00 am in the morning, during the mid-afternoon).	Makes a road traffic accident more likely. Injury possible to not only the crew member but also members of the public.	Change work practices so that cumulative fatigue is not an issue. Have coffee available and a place to nap at work before driving. Pay for taxis. Monitor work practices and fatigue levels.
<b>Causes of fatigue unique to your operation</b>	Your vessel.	Your vessel.	Your vessel.

The worst causes of fatigue often occur unexpectedly. Often you know what these could be (such as the engine breaking down) but you cannot tell if or when they will occur. Getting people together to brainstorm what has happened in the past in your operation, and what may go wrong in the future, is a good way of identifying this type of problem.

If you have a complicated operation, or if there are fatigue problems you feel you haven't come to grips with, discuss your situation with your SSM company or local maritime safety inspector. The *Fatigue tools for vessel owners* booklet may give you some ideas on how to understand your situation better.

## MARITIME NEW ZEALAND ADVICE

### Minimum hours of rest

Hours of rest are not the same as time available for sleep. Crew will have personal care and family and personal business to attend to. In addition, sleep at certain times of the day (late morning to early afternoon and early evening) is virtually impossible, as a result of how the body clock works (see brochure *Understanding fatigue*.)

The hours of rest recommended here are a guide only. They are not a legal requirement.

Maritime New Zealand recommends:

- a minimum of 77 hours of rest in a 7-day period
- a minimum of one continuous block of 6 hours sleep per 24 hours. (Disrupted sleep is less restful.)
- 2 consecutive nights available for sleep between 10.00 pm and 8.00 am, at least fortnightly and preferably once a week. (Recovery sleep needs to take place at night.)

Maritime New Zealand recognises that some operations do require long hours to be worked, either regularly or occasionally. When this occurs Maritime New Zealand recommends that:

- the operation be examined to determine if alternative work arrangements can be put in place
- attention is paid to the risks associated with long hours of work and cumulative fatigue
- additional time off is given to allow recovery.

Cumulative fatigue:

- if cumulative fatigue is to be avoided, 14 hours of sleep per 48 hours is recommended. (The average person requires 7-8 hours of sleep per night to be fully rested).
- if fatigue accumulation is fast, limit days worked to 1-3, depending how fast fatigue accumulates
- if fatigue accumulation is gradual, limit days worked to 5-6.

### Developing a fatigue management plan

Depending on the operation, writing a fatigue management plan may be simple, or "easier said than done". Regardless of how easy it is to write, the chances are that it won't be 100% right when first written. That is why it is essential to follow these three steps:

1. Develop the draft fatigue management plan. This should be led by the owner, with assistance from the skipper and crew, and others where needed (eg the SSM company).
2. Trial the plan. The trial should be for several weeks.
3. Revise the plan. A number of operators have found it useful to review their plans at the end of each season.

### Watchkeeping alarms

Maritime New Zealand recommends watchkeeper alarms are installed on all vessels which will sail with a solo watchkeeper after midnight. When a watchkeeper alarm is installed, it is recommended that:

- there is a company policy on the use of the alarm (when and how)
- the alarm be used in such a way that the watchkeeper cannot turn it off or muffle it. (Both these actions can occur when watchkeepers are tired.)

The watchkeeper alarm is viewed as a fatigue countermeasure of last resort (the ambulance at the bottom of the cliff). It is not a substitute for the other strategies described in this guide.

## > Before Sailing

- > Owner monitors performance and gives feedback
- > Owner makes expectations about fatigue clear
- > Make contingency if crew not available
- > Skipper to assess crew's fitness for duty



## LEGAL OBLIGATIONS

The table below outlines the legal requirements that apply to the management of fatigue, together with suggestions on how to meet them. These requirements are from the Maritime Transport Act 1994 (MTA Act), Health and Safety in Employment Act 1992 (HSE Act) and Maritime Rules (Rule).

**Table 1 – Laws that apply to fatigue management**

LEGISLATIVE REQUIREMENT	EXAMPLES OF STEPS THAT CAN BE TAKEN TO MEET LEGAL REQUIREMENTS
<ul style="list-style-type: none"> <li>Employers to ensure methods for systematically identifying and managing hazards (HSE Act s6).</li> </ul>	<ul style="list-style-type: none"> <li>Survey crew on their experience of fatigue and views on its causes.</li> <li>Conduct accident and incident analysis.</li> <li>Provide checklists on “how to identify fatigue in yourself and others”.</li> </ul>
<ul style="list-style-type: none"> <li>Employer to take all practicable steps to eliminate all significant hazards or isolate employees from them. (HSE Act s8 and s9). If this is not possible the hazard must be managed so it is minimised (HSE Act s10).</li> <li>Owner and master must establish and implement procedures to ensure that all crew are fit for duty when keeping a watch (Rules 31A (s26 &amp; 27), 31B (s16 &amp; 17), 31C (s14 &amp; 15)).</li> <li>When determining a seafarer’s fitness for duty the owner and master must take into account the relationship between fatigue, alertness and performance (Rules 31A, B, C).</li> </ul>	<ul style="list-style-type: none"> <li>Involve crew in determining what causes fatigue and developing the best response to fatigue hazards.</li> <li>Determine safe manning levels and ensure the vessel is manned to these levels.</li> <li>Develop and post duty schedules.</li> <li>Post checklists on how to identify fatigue.</li> <li>Provide guidance on how to manage fatigued seafarers.</li> <li>Monitor fatigue levels and risk associated with fatigue.</li> </ul>
<ul style="list-style-type: none"> <li>Where hazards cannot be eliminated or isolated monitor the employee’s exposure to the hazard and report to employees on the results of the monitoring (HSE Act s10).</li> <li>Owner to carry out internal audits to verify whether safety activities comply with the SSM system (Rule 21).</li> <li>Logbook to include a record of watchkeeping crew, where a vessel is 45 m or more and proceeds beyond restricted limits. Also applies to all vessels on international voyages (Rule 73).</li> </ul>	<ul style="list-style-type: none"> <li>Conduct surveys of crew and any others to whom a duty of care applies.</li> <li>Provide checklists on “how to identify fatigue in yourself and others”.</li> <li>Ensure logbooks include watchkeeping hours.</li> <li>Encourage medical examinations where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Employer to provide reasonable opportunities for employees to participate in ongoing processes for improvement of health and safety (HSE Act s19B).</li> </ul>	<ul style="list-style-type: none"> <li>Involve crew in identifying hazards.</li> <li>Involve crew in determining the best response to fatigue hazards.</li> <li>Involve crew in on-going monitoring.</li> </ul>
<ul style="list-style-type: none"> <li>Employer to provide training and supervision to all employees, so as to promote safety (MTA Act s17 (4) (b) and HSE s13).</li> </ul>	<ul style="list-style-type: none"> <li>Provide training materials and courses, where appropriate.</li> <li>Provide active supervision.</li> <li>Keep records and use them as a management tool.</li> </ul>

## > Sleep

- > Make a good night's sleep before sailing a priority
- > Ensure sleeping environment allows quality sleep
- > Allow sufficient time off for recovery
- > Encourage crew to bring sleep problems forward



## HOW TO WRITE A FATIGUE MANAGEMENT PLAN

### Educate before you start

Distribute the brochure *Understanding fatigue* and discuss with your staff or work colleagues. Your SSM company or local maritime safety inspector may be able to take a short session on fatigue. Sharing training with other vessel owners may lower costs and provide you with additional insights.

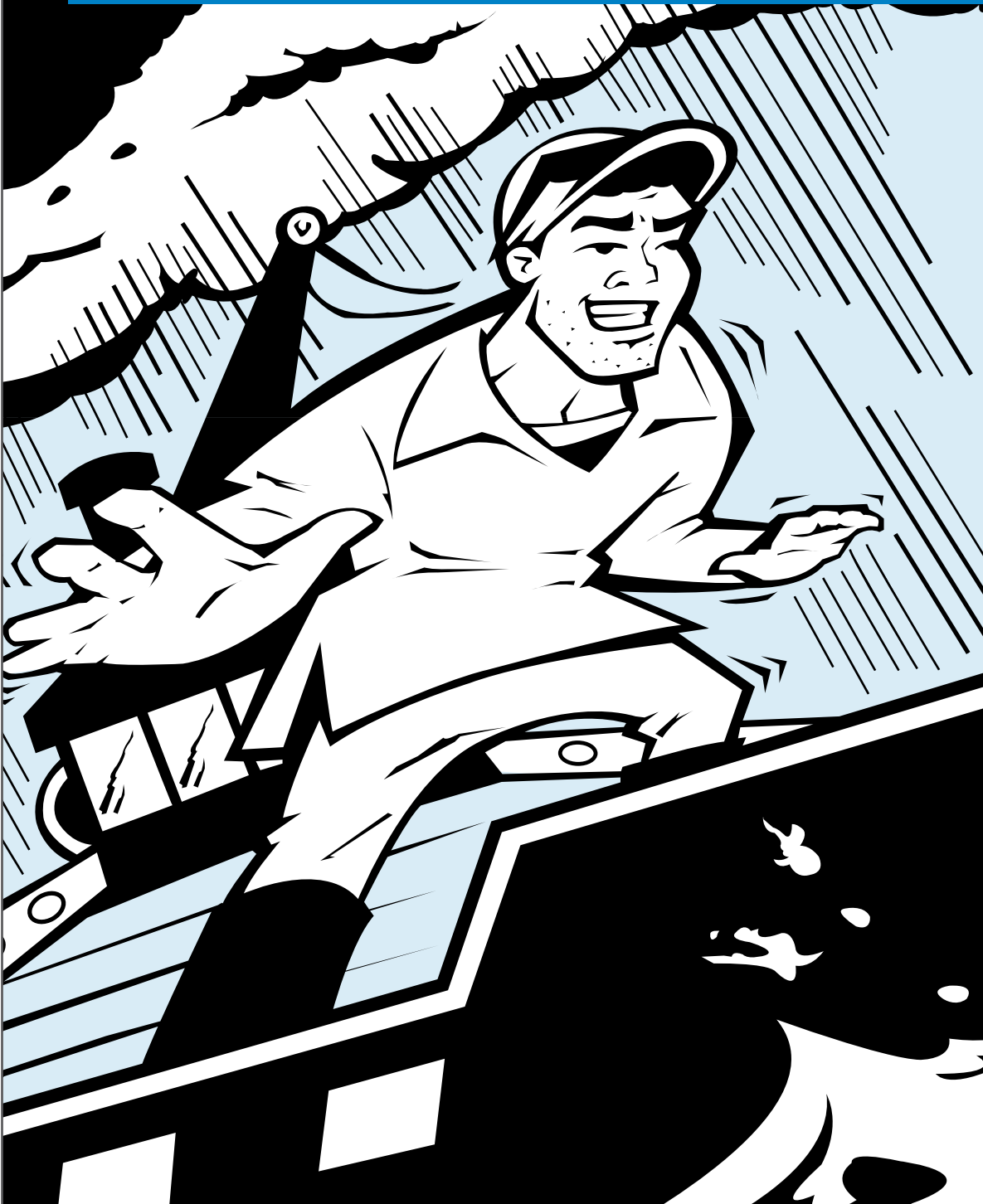
### Key parts of a fatigue management plan

Listed below are the key parts of a fatigue management plan, including your main legal responsibilities.

<b>Owner expectations</b>	<p>What is important to the owner, the bottom line for safety.</p> <p>This lets the skipper and crew know how to act in both preventing fatigue and managing it when it can't be prevented.</p>
<b>Identify hazards</b>	<p>Work with your crew, shore staff, and anyone else who may be able to assist, to identify what results in fatigue in your operation. Include both:</p> <ul style="list-style-type: none"> <li>• what causes fatigue on a regular basis</li> <li>• what occasionally causes fatigue.</li> </ul>
<b>Managing hazards judged to be significant</b>	<p>Your fatigue management plan must cover the significant hazards identified. In short, a significant hazard is anything that can potentially cause harm to a person (like an injury accident or a vessel grounding which can lead to an injury).</p> <p>For each significant hazard identify how it can be eliminated, isolated, or if neither of these can be achieved, how it will be minimised.</p> <p>For actions on the vessel, record both what will happen on the vessel and what management will do to make sure the hazard is controlled. (Doing this also helps you show the auditor that you are operating an effective approach to fatigue management.)</p>
<b>Managing hazards judged not to be significant</b>	<p>For hazards you identified and judged to be not significant, you must monitor them to see that they don't develop into significant hazards. Note when you will do this and sign off when you do.</p>
<b>Assign responsibilities</b>	<p>Make sure you document each crew member's responsibilities and have them sign an acknowledgment of these.</p>
<b>Train anyone who needs training</b>	<p>Record what training occurs and make sure those who have training sign off on it.</p>
<b>Trial the draft plan</b>	<p>It is usually not possible to get the fatigue management plan totally right the first time. A 1-2 month trial is useful for fixing any problems.</p>
<b>Monitor, review and revise</b>	<p>Some causes of fatigue may be difficult to manage or may change over time (like crew fitness for duty). These may need to be monitored on a regular basis.</p> <p>Set times when you will review how well the plan worked, such as at the end of a season. Write any changes into the SSM manual.</p>

## > Working Conditions

- > Ensure rest breaks when conditions are tough
- > Discuss watchkeeping policy with crew
- > Employ sufficient staff to avoid long work days
- > Monitor fatigue and give feedback



## DOCUMENTING STEPS FOR AUDIT

Recording who is involved at each step demonstrates what you have done and who was involved.

ACTION	WHO WAS INVOLVED	METHOD USED	SIGNATURE AND DATE COMPLETED
<p><b>Educate about fatigue:</b></p> <ul style="list-style-type: none"> <li>• yourself</li> <li>• staff</li> </ul> <p>Read the <i>Understanding fatigue</i> brochure, provide training session with advisor, discuss fatigue together.</p>			
<p><b>State your expectations</b></p> <p>What is important, safety-wise, that the crew must know? When does safety take priority over production?</p>			
<p><b>Identify significant fatigue hazards</b></p> <p>Work with others, especially the crew; consider effect of different types of seasons and operating conditions; consider limitations of human biology, especially cumulative fatigue; consider what surprises may occur unexpectedly.</p>			
<p><b>Develop measures to eliminate, isolate or minimise these hazards</b></p> <p>Work with others, especially the crew; consider how these measures change for different seasons and operating conditions. Include contingency plans.</p>			
<p><b>Identify management actions</b></p> <p>These support measures to eliminate, isolate or minimise hazards.</p>			
<p><b>Assign responsibilities and train staff</b></p> <p>You are legally obliged to provide training where a need exists.</p>			
<p><b>Trial the draft fatigue management plan during the shake-down phase.</b></p> <p>This is part of SSM procedures, especially for new vessels. It helps sort out any “bugs”.</p>			
<p><b>Monitor and review</b></p> <p>How are you going to monitor fatigue and operation of your plan? When and how do you plan to review the plan?</p>			
<p><b>Revise the plan</b></p> <p>This is a management action that follows from the review.</p>			





# *Get* your sleep Reduce your risk

**Published by**

Maritime New Zealand  
PO Box 27006, Wellington 6141, New Zealand.  
[www.maritimenz.govt.nz](http://www.maritimenz.govt.nz)  
2007  
ISBN 978-0-478-18855-4