Fatigue Management Plan

A practical guide to developing and implementing a fatigue management plan for the NSW mining and extractives industry.

Mine Safety Advisory Council

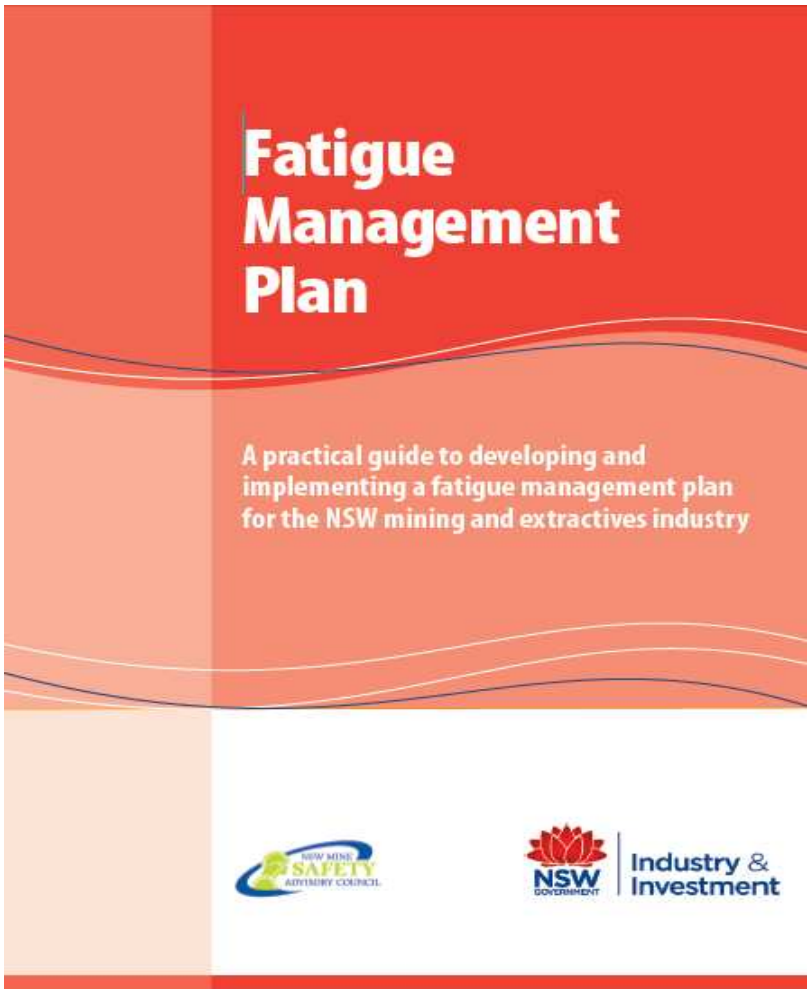
This workshop is an initiative of the
NSW Mine Safety Advisory Council

Mine Safety Advisory Council

- Employers, unions and I&I NSW developed the Guide through MSAC
- Supported by the Minister for Mineral Resources
- Will help mines to meet legislative obligations and implement good practice approaches
- Working towards world-leading OHS

The Guide represents an agreed standard.

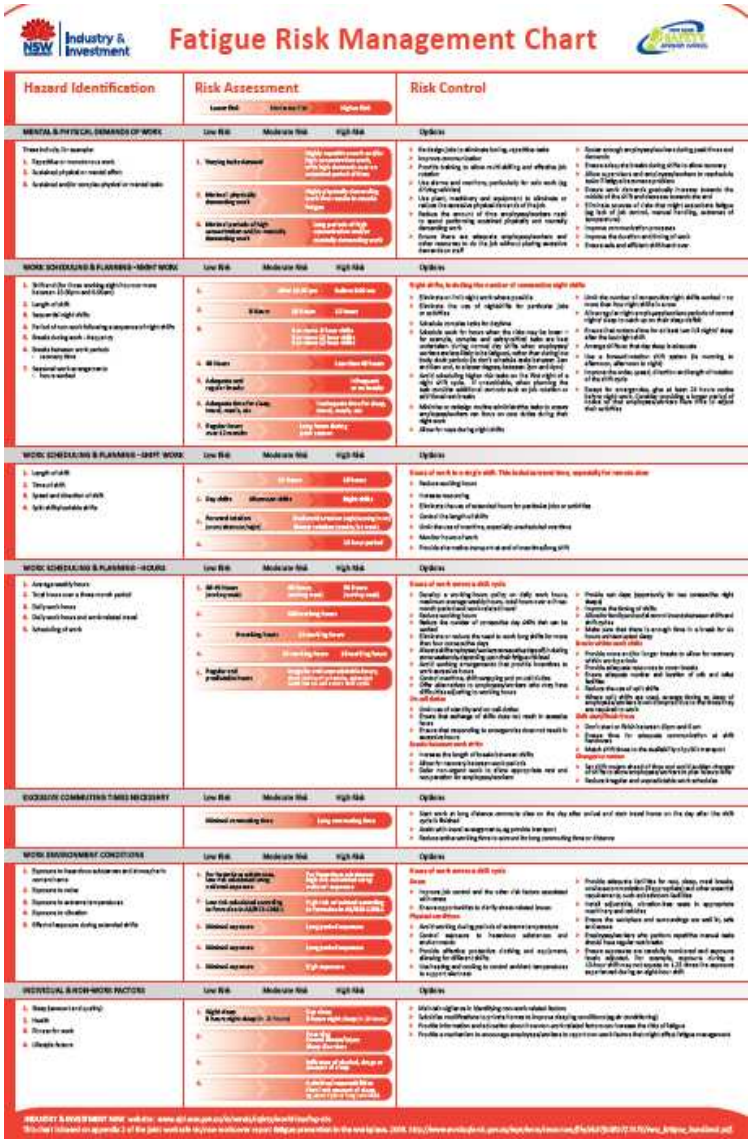
Fatigue Management Plan



- Systematically manage fatigue risks
- Development and Implementation of FMP
- Fatigue Risk Management
- Fatigue Management Plan Documentation
- Monitoring and Evaluating Fatigue Management Plan

The Fatigue Management Chart

- Mental & Physical Demands of Work
- Work Scheduling & Planning Night Work
- Work Scheduling & Planning Shift Work
- Work Scheduling & Planning Hours
- Excessive Commuting Time Necessary
- Work Environment
- Individual and Non Factors



Session Objectives

Learning Outcome 1

Understanding fatigue

Learning Outcome 2

Fatigue risk management

Learning Outcome 3

A joint approach to managing fatigue

Learning Outcome 4

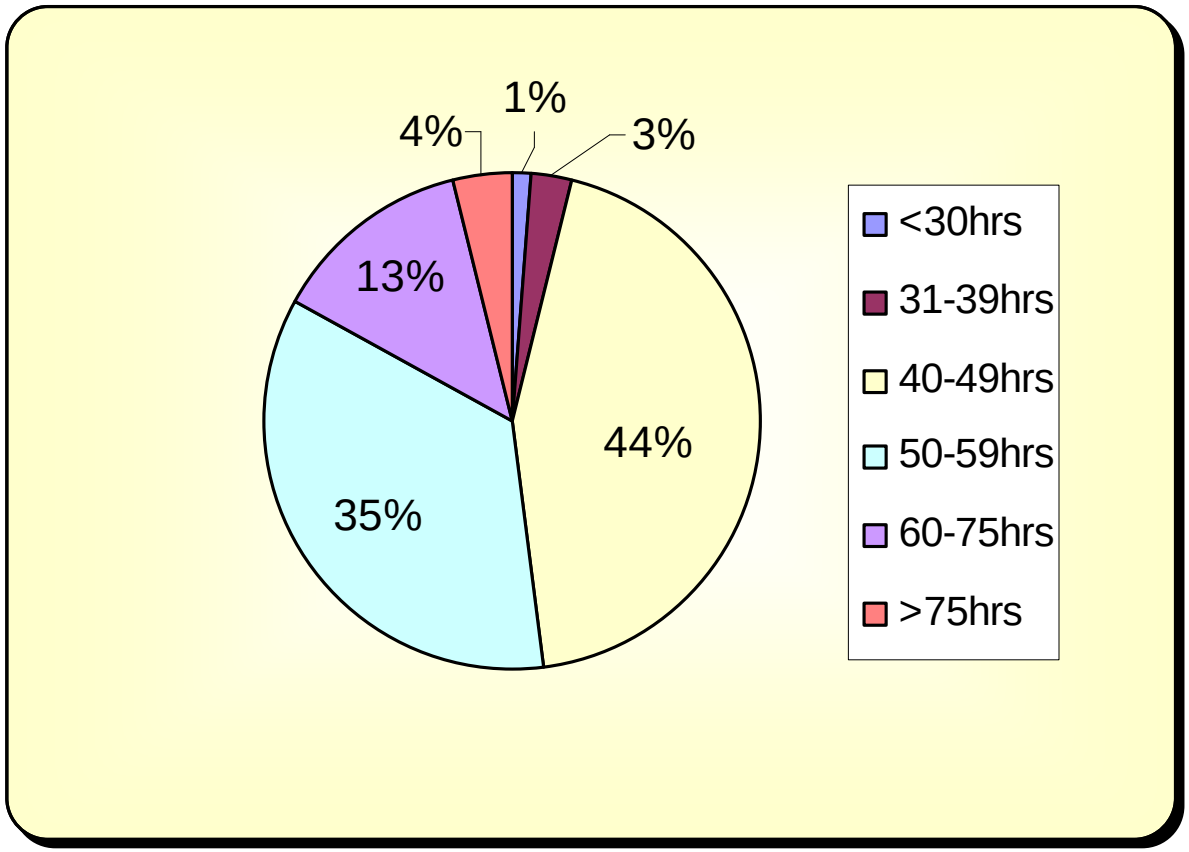
Implementation of a fatigue management plan

Learning Outcome 1: Understanding fatigue

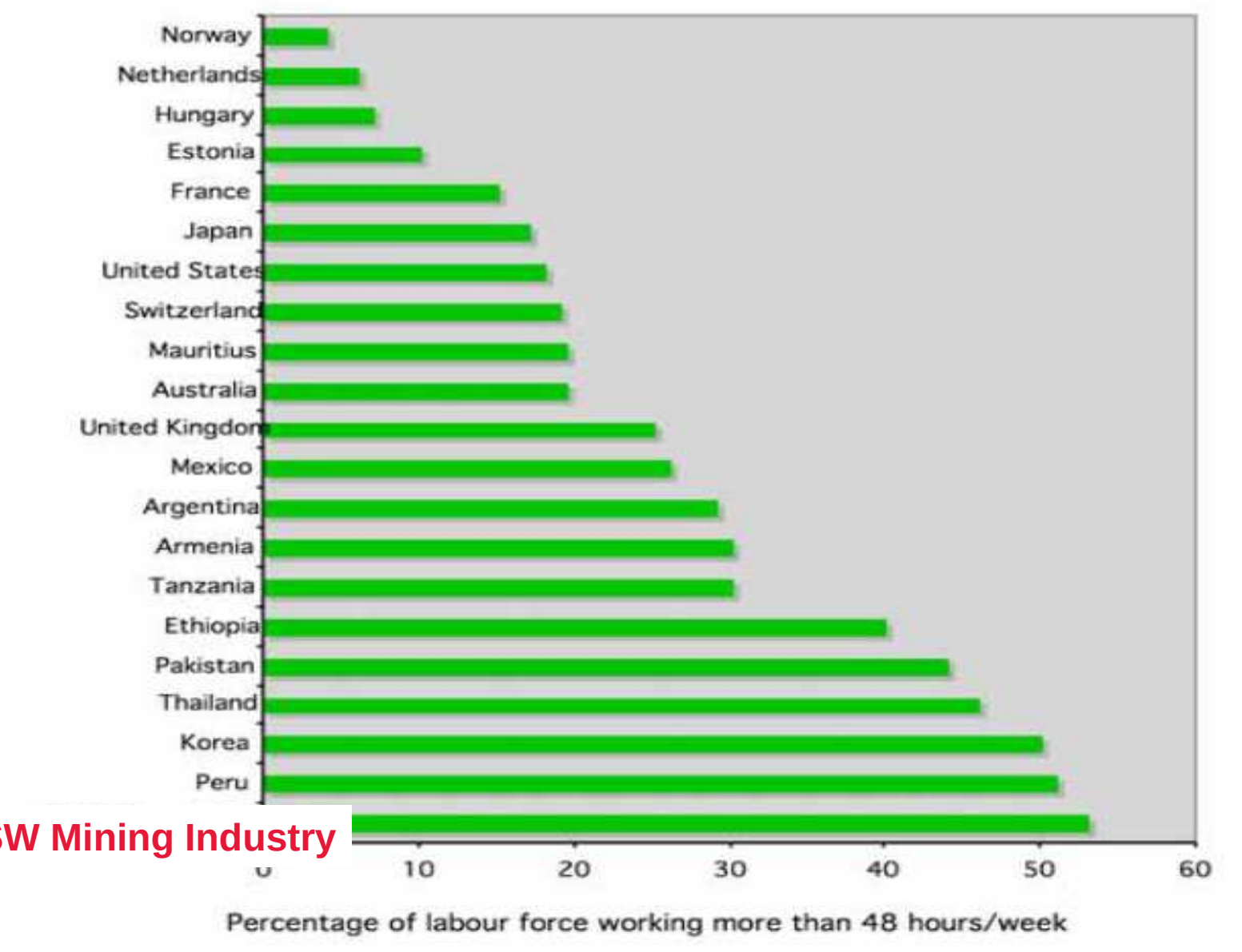
Background to fatigue in the mining industry

Fatigue and the consequences of fatigue

An issue in NSW Mining

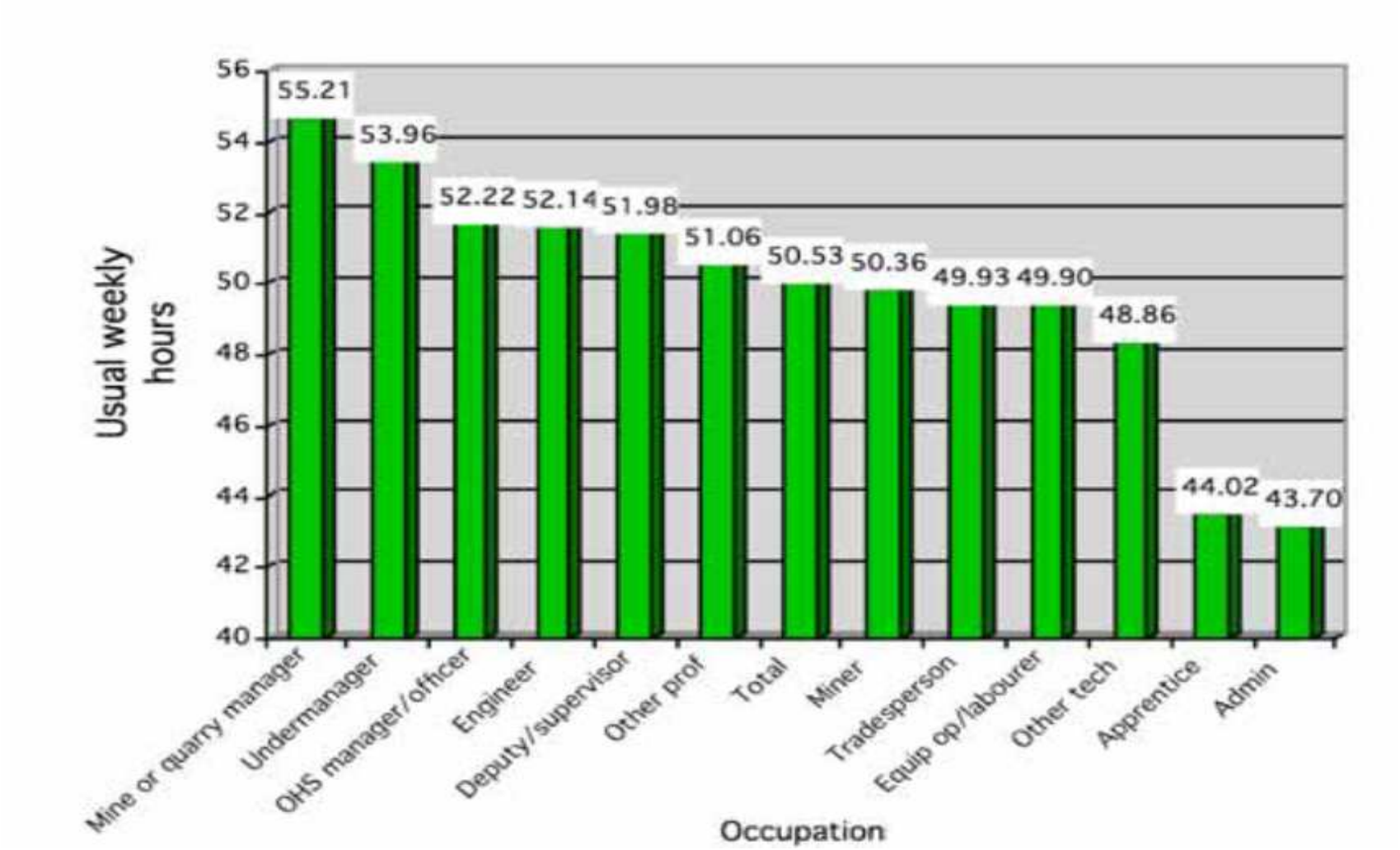


Average Mining Hours Worked



NSW Mining Industry

Differences between **occupation**



Differences between **sectors and employee type**

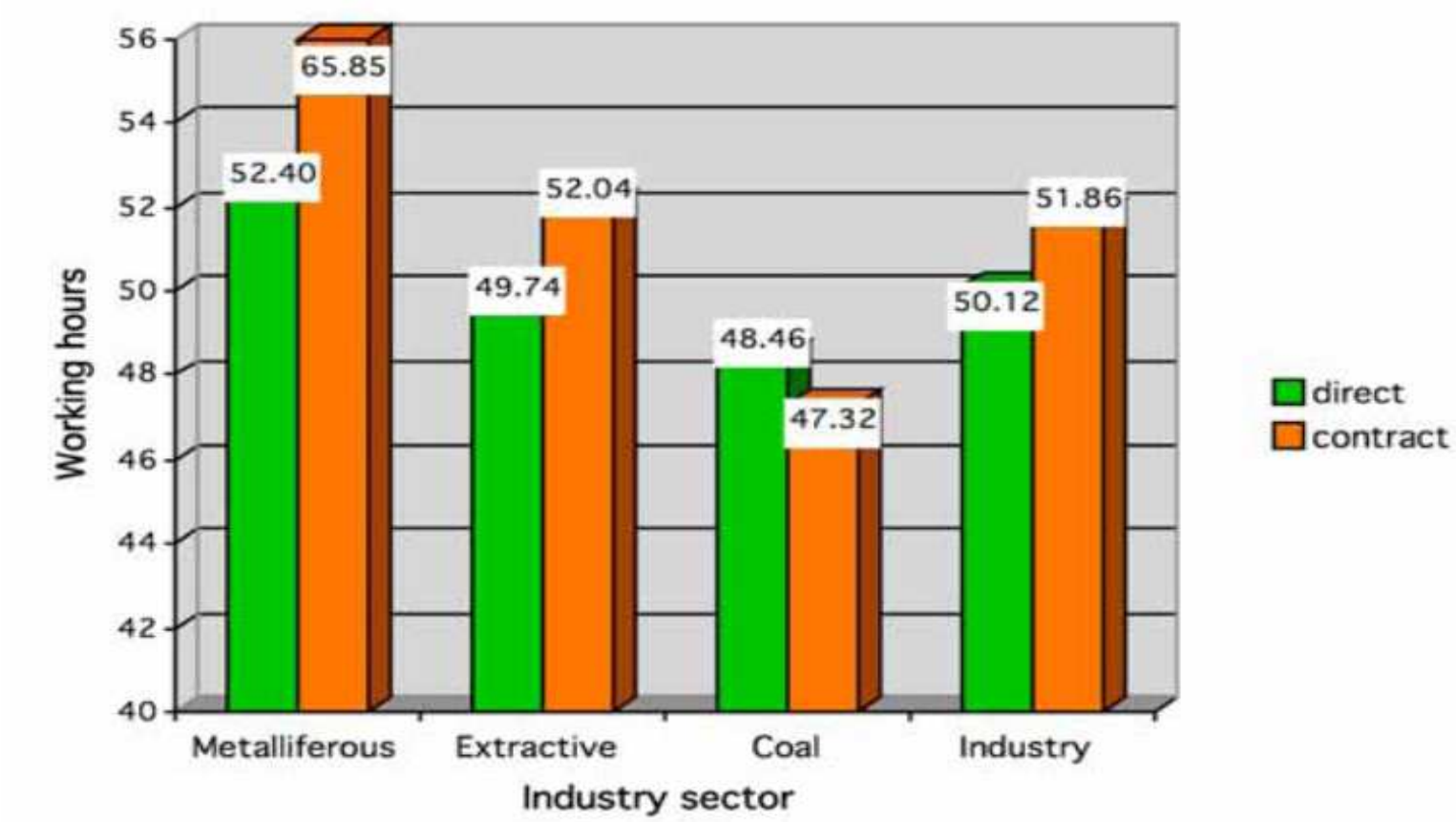
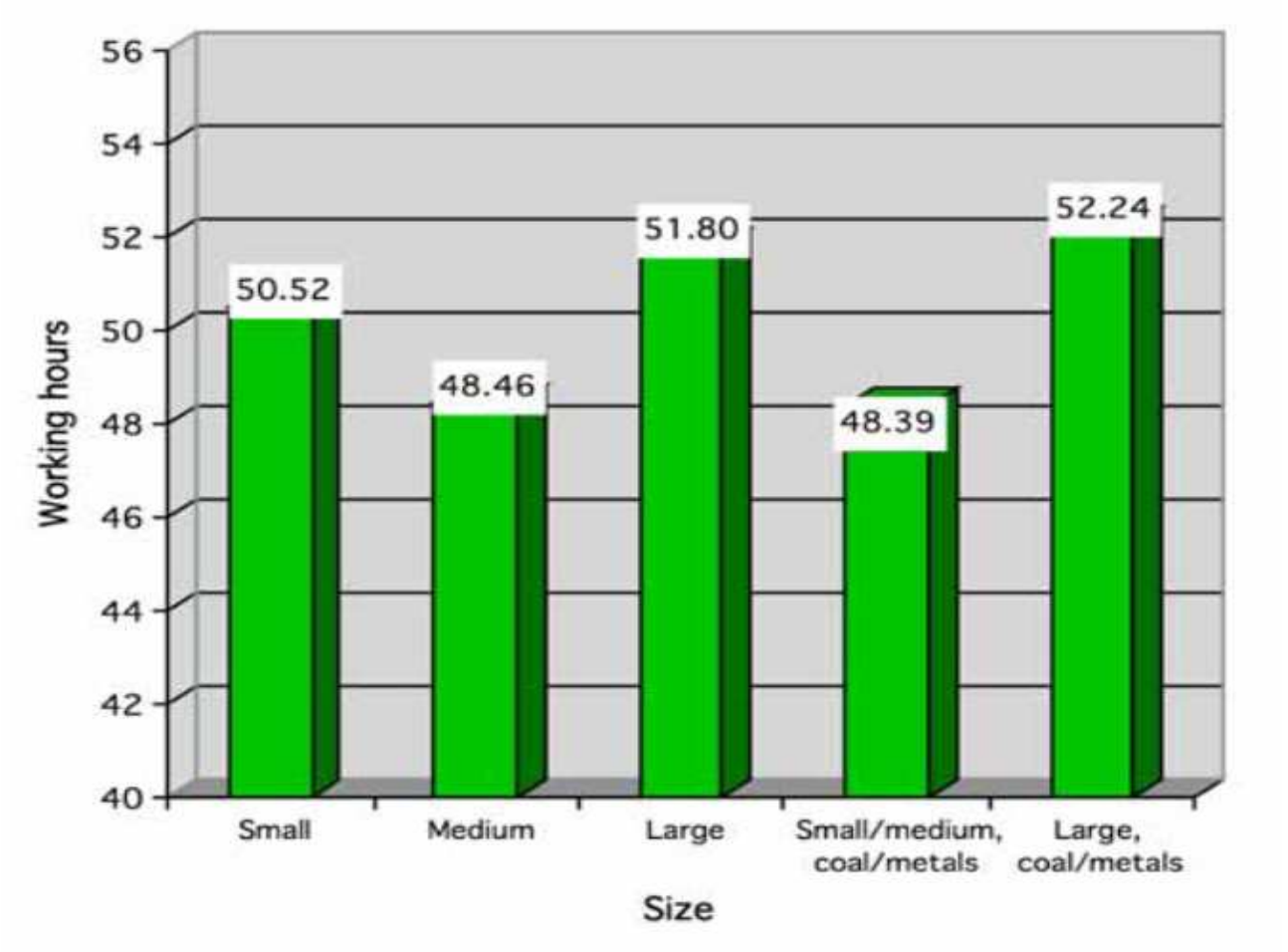


Figure 4.5. Employment status, sector and usual weekly hours of work

Differences between **size of mine**



Differences between **location of mines**

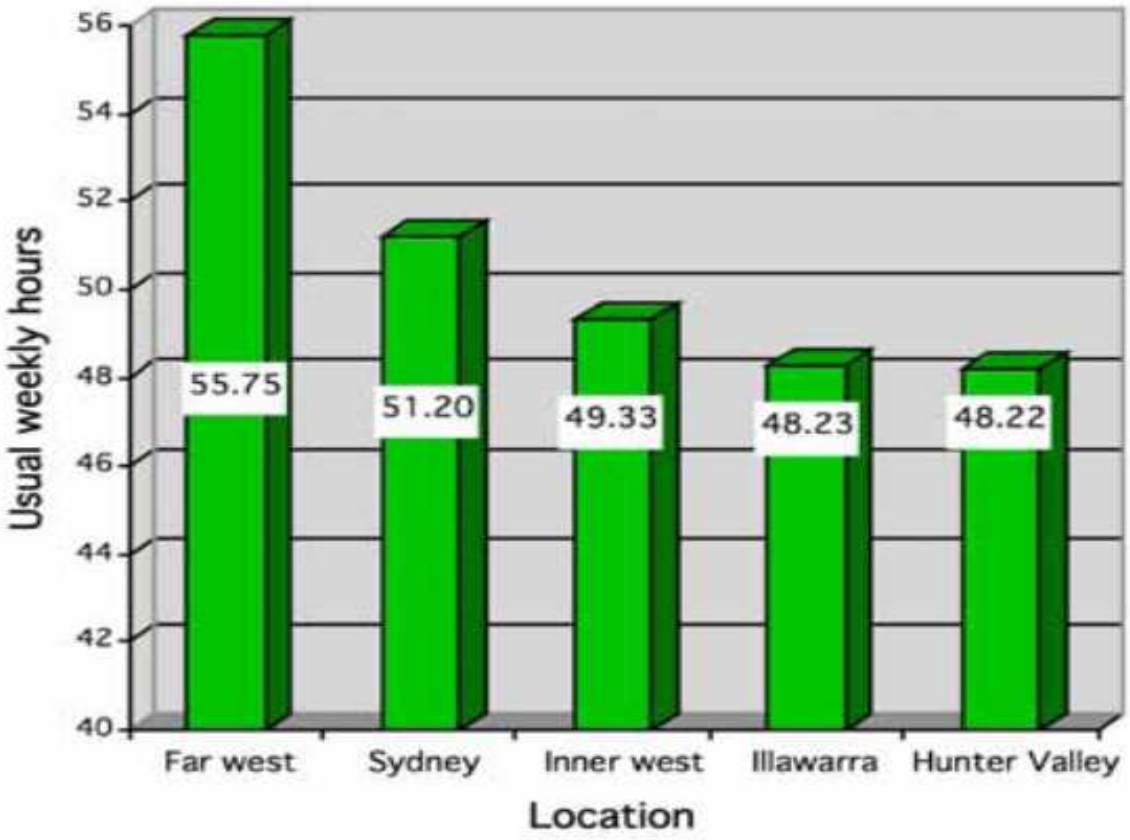


Figure 4.7. Locations and usual weekly hours of work

What is fatigue?

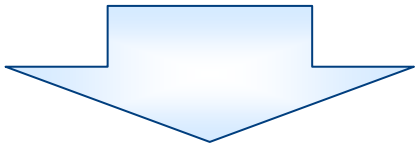
Fatigue is described as a state of impaired physical and / or mental performance and lowered alertness.

Fatigue results from insufficient rest and sleep between activities

Activity 1: Consequences of fatigue

Short Term Consequences

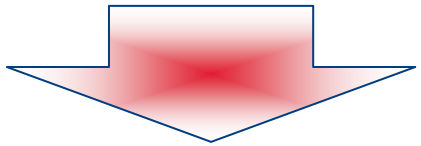
- Reduced concentration
- Impaired attention
- Poor judgement
- Inability to assess problems
- Impaired decision making
- Slower reaction time
- Mood swings



↑ Exposure to safety risks

Long Term Consequences

- Heart disease
- Gastrointestinal disorders
- Sleep disorders
- Psychosocial disorders
- Fertility problems



↑ Exposure to health risks

Learning Outcome 2: Fatigue risk management

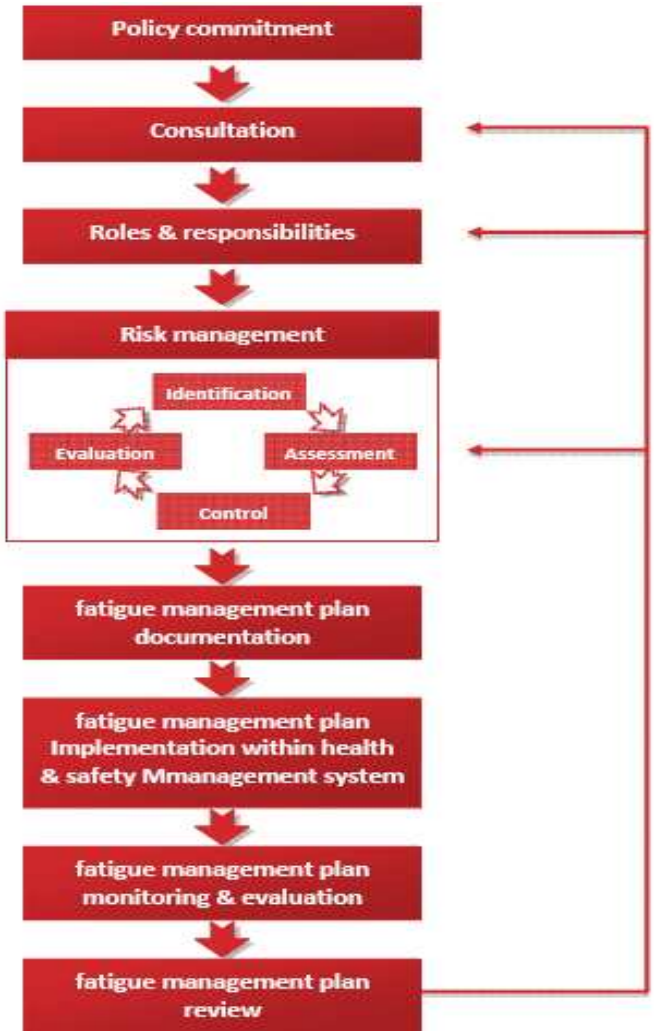
Hazard identification: contributing and compounding factors

Risk assessment

Risk control

Risk control evaluation

Fatigue Risk Management



A systematic approach to implementing a fatigue management plan

Fatigue hazard identification

- Factors ***contributing*** to fatigue

Amount & Quality of Sleep

- Work Schedule & planning (night work, shift work and hours)
- Excessive commute times
- Individual and non-work factors

- Factors ***compounding*** fatigue

Job Demands & Work Environment

- Mental & physical demands of job
- Work environment conditions

Factors ***contributing*** to fatigue

Amount & Quality of Sleep

- Time awake – shift length
- Time of day - circadian rhythms
- Shift patterns
  - consecutive night shifts
  - start times
  - shift length/commuting
  - direction of rotation

Activity 2 – Sleep opportunity

Sleep Opportunity Equation

- W = Work Time
- T = Travel Time
- M = Morning Awake Time
- E = Evening Awake Time
- SO = Sleep Opportunity

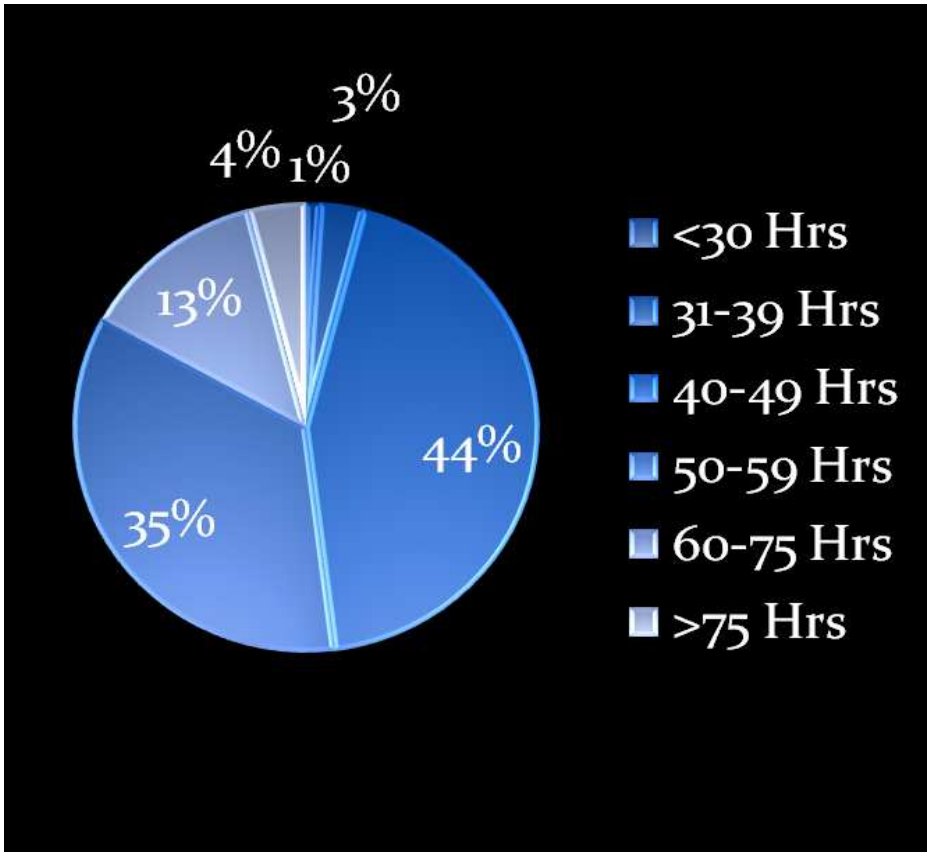
Equation :

to determine sleep opportunity

$24-\{(W+T)+(M+E)\}=SO$

Time to unwind

Average Mining Hours Worked



Is 4 hours enough for you?

Individual and non- work related factors

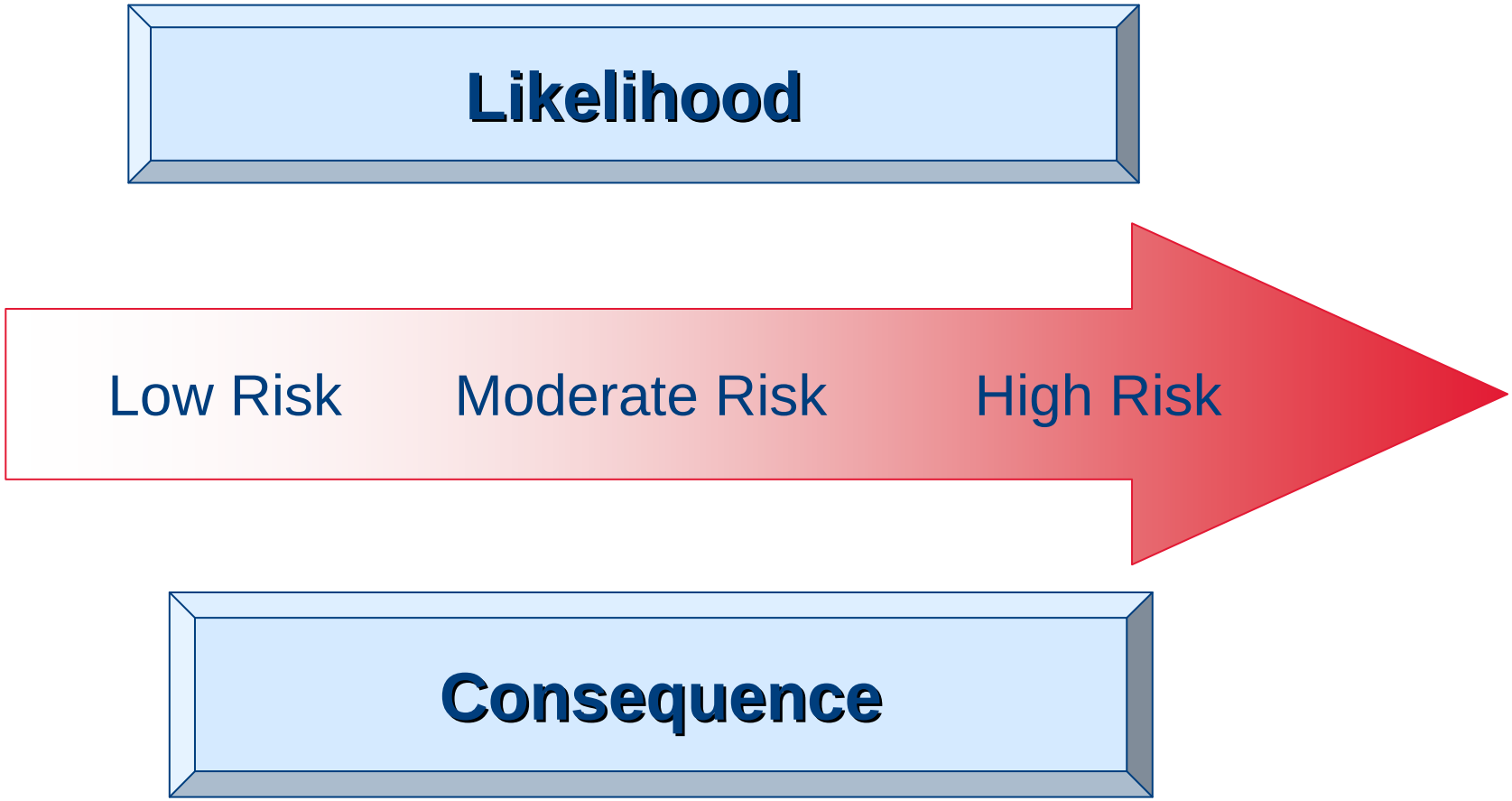
- Lifestyle Factors
- Home environment
- Health conditions

Factors ***compounding*** fatigue

- Work environment
- Mental and physical demands of the job

Job Demands & Work Environment

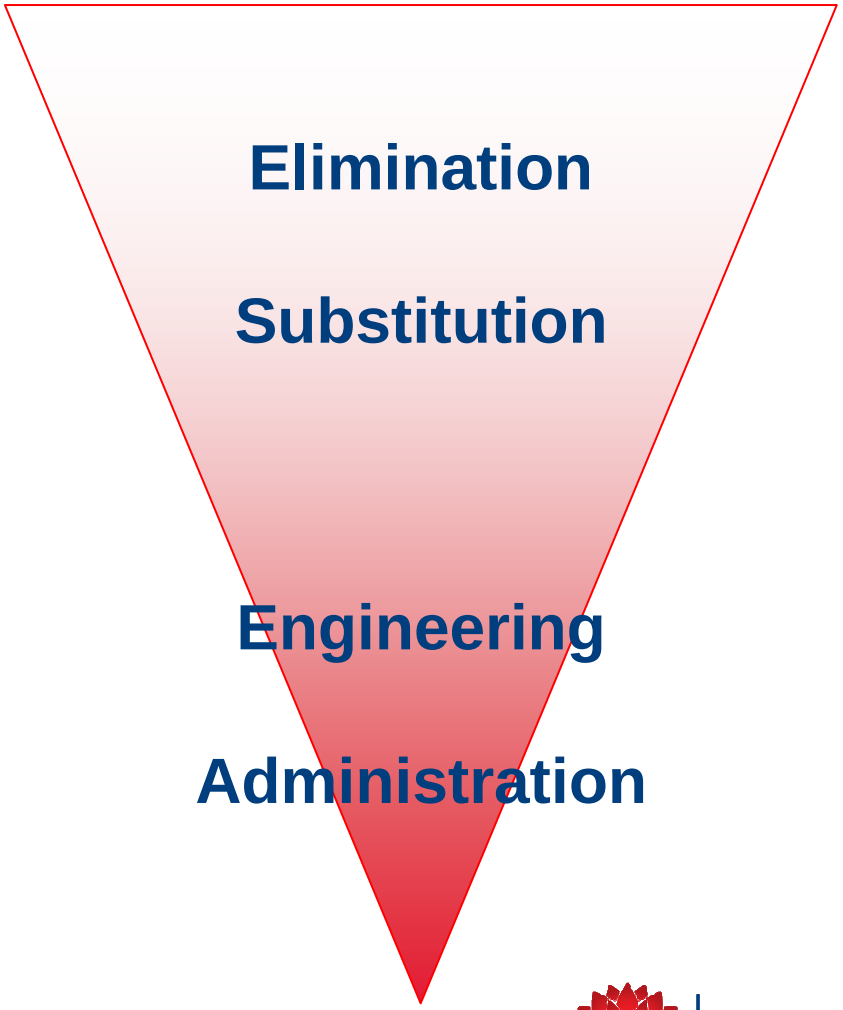
Exercise 1 - Fatigue risk assessment



Exercise 2 - Fatigue risk control

Amount & Quality of Sleep

Job Demands & Work Environment



Risk control evaluation

- Have the control measures been implemented as planned
- Are they working
- Are there any new problems
- Have there been any incidents, nears misses, injuries and other data, such as absenteeism and staff turnover

Learning Outcome 3: A joint approach to managing fatigue

When is a plan required

Approach to fatigue management

Benefits and barriers: consultation

When is a plan required?

- ALL mines must conduct a fatigue risk assessment
- A fatigue management plan is required:

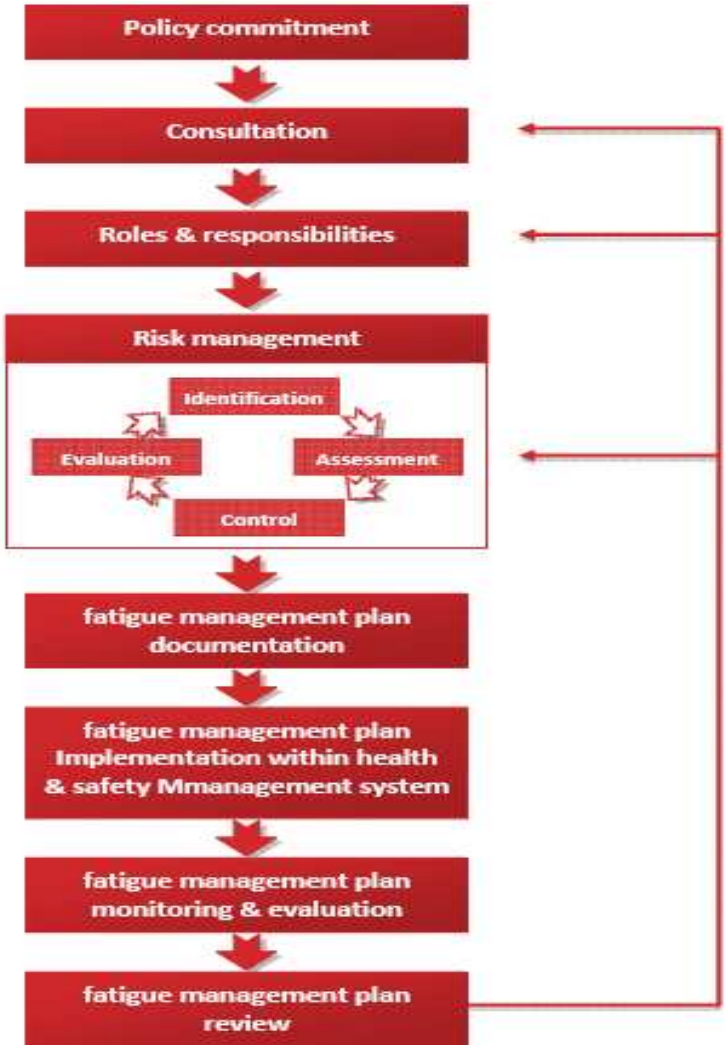
  - operating hours outside of day shift (between 6am and 7pm)

  - involve more then 48hours in any consecutive 5-day period

  - do not have a minimum of 2 consecutive days off in any 7-day period

  - fatigue hazards have been identified as part of a risk assessment

Fatigue management



A systematic approach to developing a fatigue management plan

Policy Commitment

Consultation

Roles & Responsibilities

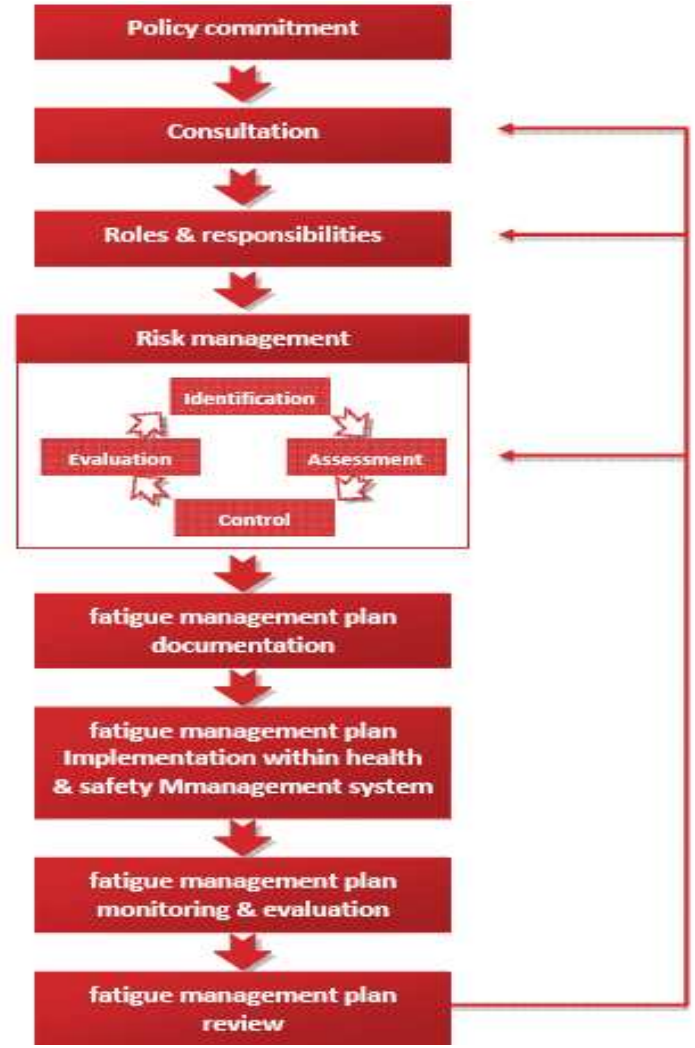
Activity 3 – Barriers and benefits

	Benefits	Barriers
Individual	▪Health	▪Perceived reduction in earning
Organisation	▪Reduced absenteeism	▪Perceived reduction in production

Learning Outcome 4: Implementing a fatigue management plan

- Document, evaluate and review
- Self assessment
- Goals and performance indicators
- Implementing a fatigue management plan

Fatigue Management



Implementing a fatigue management plan

- Documentation
- Implementation within health & safety management system
- Monitoring & evaluation
- Review

Fatigue management plan documentation

- A policy commitment
- A statement of the principles
- Roles and responsibilities
- The risk assessments that have been undertaken
- The risk controls that are and will be in place, along with an implementation strategy
- how actual hours of works and sleep will be monitored
- The support systems in place
- The approach to monitoring and reviewing the plan

Fatigue management plan documentation

- **Specific to site**
- **Developed through consultation**
- **Available to employees / workers and**
- **visitors**
- **Communicated regularly**
- **Reviewed regularly**

Implementation within health & safety management system

- Action plan
- Testing of controls
- Training
- Roles and responsibilities
- Communication
- Participation

Monitoring, evaluation and review

- Has consultation occurred for:
  - risk assessment of tasks
  - decisions made toward the controls of risk
  - changes to premises, systems, work methods, plant, substance or welfare at work
  - decisions about consultation arrangements

- Areas that may require monitoring
  - Hours of work which dictates sleep opportunity
  - Shift arrangements
  - Allocation of breaks

Exercise 3 – Self assessment

Fatigue management self-assessment

Mine name:		Section:	
Assessment Team Leader:		Participants (names/positions):	

QUESTIONNAIRE	RESPONSE						
	Not started	Just started		Progressing		Done	Averaged Score
CONSULTATION, COMMITMENT AND RESPONSIBILITES: Everybody is given sufficient opportunity, time and resources to participate in fatigue management and are clear about their roles and responsibilities.	0	1	2	3	4	5	
Fatigue management is reflected in the site's health and safety policy or there is a stand alone fatigue management policy. The policy has been developed in consultation with employees and contractors and is signed by the most senior appropriate person.	☐	☐	☐	☐	☐	☐	☐
Commitment to fatigue management is demonstrated by having fatigue management procedures (or plan) in place and allocating time, money and training resources.	☐	☐	☐	☐	☐	☐	
FATIGUE RISK MANAGEMENT: Everybody works together to identify the FATIGUE hazards and fix problems at the source before exposures occur.							
Workers are provided with necessary information about fatigue hazards and controls to enable meaningful participation in fatigue risk management.	☐	☐	☐	☐	☐	☐	
Work- related fatigue risks impacting on the amount and quality of sleep (such as work scheduling and planning) of employees and contractors are considered when carrying out fatigue risk management.	☐	☐	☐	☐	☐	☐	
The risk management process considers how mental and physical demands of the job and the work environment contribute/ impact the effects of fatigue.	☐	☐	☐	☐	☐	☐	☐
Fatigue related risks are controlled according to the "hierarchy of control" and controls are monitored and reviewed for their continued effectiveness.	☐	☐	☐	☐	☐	☐	
The health and safety reporting system allows employees to report themselves or others as fatigued without criticism.	☐	☐	☐	☐	☐	☐	
Fatigue-related information is captured in the incident reporting process.	☐	☐	☐	☐	☐	☐	
IMPLEMENTING FATIGUE MANAGEMENT – Everybody is competent to manage health risks within their area of responsibility and supervisors are trusted and decisions are supported.							
Supervisors identify when fatigue is an issue and initiate immediate control measures and record concern for further review (as required).	☐	☐	☐	☐	☐	☐	
Employees and contractors are provided education and awareness about the site's fatigue management plan and procedures at induction and on a periodic basis. Consideration is given when communicating to those on shift work and contractors to ensure all have been informed on fatigue management issues.	☐	☐	☐	☐	☐	☐	
Unplanned changes to the work schedule (e.g. maintenance, break downs, unexpected shortage of staff) are considered in fatigue risk management planning. For employees and contractors.	☐	☐	☐	☐	☐	☐	☐
Safety-critical tasks are not performed at times when fatigue is likely to be higher? If tasks need to be performed, fatigue related risks have been considered as part of the risk assessment/ work instructions and procedures.	☐	☐	☐	☐	☐	☐	
Sites have a system/ methods for monitoring hours of work of employees and contractors.	☐	☐	☐	☐	☐	☐	
IMPLEMENTING HEALTH MANAGEMENT - EVALUATION AND REVIEW: The fatigue management plan includes ongoing monitoring and evaluation for effectiveness.							
The fatigue management procedure or plan is reviewed at regular intervals to ensure the continued effectiveness of the controls.	☐	☐	☐	☐	☐	☐	☐
Review of control measures are undertaken when methods, tasks, equipment, hazards, operations, procedures, rosters or schedules are introduced or the environment changes or there is any indication risks are not being controlled.	☐	☐	☐	☐	☐	☐	

Activity 4: Setting goals and performance indicators

GOAL

Maintain actual hours of work at 48 hrs per week

Activity 4: Setting goals and performance indicators

GOALS	PERFORMANCE INDICATOR
Maintain actual hours of work at 48 hrs per week	**Actual hours maintained below 48 hrs for 90% of workforce**

Activity 5: Developing an action plan

GOALS	PERFORMANCE INDICATORS	ACTIONS
Maintain actual hours of work at 48 hrs per week	**Actual hours maintained below 48 hrs for 90% of workforce**	***•Analyse roster •Assess sleep opportunity •Identify problems •Consult •Assign roles and responsibilities •Communication program •Monitor***

Activity 4/5 (Alternative)

1. *Elements* of fatigue management that your organisation is doing well

2. To continue to drive improvements of fatigue management, identify *key performance indicators*

3. Develop an *action list* to improve your organisation's management of fatigue risks.

SUMMARY

- Plan with consultation to get commitment from all levels
- Establish a joint approach
- Education and communication
- Goals, performance indicators and an action plan
- Monitoring hours and sleep opportunity is good practice
- Auditing and review allows for continuous improvements to your management of health

Further Information on Fatigue

Fatigue management for managers

FACTSHEET 1 Fatigue management

NSW mining and extractives industry

Introduction

The purpose of this fact sheet is to provide managers with a summary of the key elements contained within the publication 'Fatigue Management Plan: A practical guide to developing and implementing a fatigue management plan'. The guide is endorsed by the Mine Safety Advisory Council and provides a detailed framework on how to develop and implement a systematic approach to the management of fatigue. This fact sheet summarises some of the key points contained in the 'Fatigue Management Plan' guide.

How does your organisation manage fatigue?

The objective of a fatigue management plan is to ensure in consultation that:

- the systems of work and the work environment eliminate or adequately control the risks associated with fatigue;
- roles and responsibilities are clearly understood;
- informed decisions are made in regards to hours of work, working arrangements and shift rosters;
- ongoing assessment and monitoring of conditions, rosters, unplanned work and tasks to ensure they do not result in fatigue;
- supervisors and managers are provided with the necessary training and information to enable them to carry out their responsibilities towards managing fatigue;
- individuals receive education and training on fatigue management and are fit for work;
- incidents are investigated and analysed to identify possible fatigue related causal factors to prevent reoccurrence;
- a "no blame" approach to fatigue identification and self reporting is promoted;
- contractor fatigue is managed consistently within the mine's fatigue management plan.

Obligations and responsibilities

Operators and those with responsibilities that include management or control of workplaces are required to:

- ensure the health and safety and welfare of employees and visitors with regard to fatigue;
- have a health and safety management system or plan that includes fatigue management;
- consult with employees, and those doing particular types of work, about the fatigue risks;
- provide information and instruction on managing fatigue risks;
- identify fatigue hazards;
- assess fatigue risks;
- eliminate or control fatigue risks; and
- provide supervision of work practices.

All people working at or visiting the mine are required to co-operate with the fatigue management plan and report issues or problems.

Fatigue management for workers

FACTSHEET 2 Fatigue management

NSW mining and extractives industry

Introduction

Employers, contractors and employees all have an obligation to manage the risks associated with fatigue at the mine.

Mine operators/employers must provide systems of work and a work environment that are safe and without risk to health. For fatigue risks this means that if a fatigue risk is identified mine operators/employers should develop and implement a fatigue management plan.

Employers must also consult with workers and contractors at the mine in the development of the fatigue management plan.

All those working at or visiting a mine have a responsibility towards maintaining the safe systems of work set by the management of that mine. This includes:

- Cooperating with the operator/employer to manage fatigue risks.
- Reporting any hazards or problems relating to fatigue.

What is fatigue?

Fatigue is a physical or mental state impairment that can include physical and/or mental elements, associated with lower alertness and reduced performance.

Signs of fatigue can include tiredness even after sleep, psychological disturbances, loss of energy and inability to concentrate.

What causes fatigue?

Fatigue results from insufficient rest and sleep between activities (eg poor quality sleep). Other work related and individual factors such as shift length, more than 48 hours of work per week, night work, inadequate time to recover between shifts and blocks of shifts, job demands, long commuting times and lifestyle factors all contribute to fatigue.

What causes acute fatigue?

Acute fatigue is caused by immediate episodes of sleep deprivation; for example, because of long periods of wakefulness from excessively long shifts without adequate daytime rest. Ongoing sleep disruption can lead to sleep debt and chronic sleep deprivation.

Why is fatigue a problem?

Fatigue causes an increased likelihood (risk) of incidents because of tiredness and lack of alertness. Fatigue may result in a slower reaction to signals or situations and affect the ability to make good decisions and adapt to a constantly changing environment like mining. Consequently the human error component of incidents is increased along with the risks to health and safety.

Fatigue can also impact more personally on an individual. The negative long term health effects of fatigue typically include:

- Digestive problems.
- Stress.
- Drug and Alcohol abuse.
- Heart disease.
- Mental illness.

www.dpi.nsw.gov.au/minerals/safety/world-leading-ohs