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PETROLEUM CSG

HSE MANAGEMENT SYSTEM PROCEDURE

FATIGUE MANAGEMENT

Petroleum HSE Procedure No: PHSE-13-P06	
Date: December 1, 2010	Revision: 0.1
Owner: Kim Phillips, Occupational Health and Hygiene Manager	
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TABLE OF CONTENTS

1.0 PURPOSE.....	3
2.0 SCOPE	3
3.0 REFERENCES.....	3
4.0 DEFINITIONS	4
5.0 PROCEDURE	6
5.1 Introduction	6
5.2 Risk Assessment.....	6
5.2.1 Assessment of Control Effectiveness.....	7
5.2.2 Operational Work Schedules/Rosters.....	7
5.2.3 Office Work, Business Travel and Commute Time	7
5.3 Risk Controls	8
5.3.1 Rest	8
5.4 Training – Awareness	9
5.5 Training – Supervisory Roles	9
6.0 RESPONSIBILITIES	10
6.1 All Personnel	10
6.2 Responsible Line Managers or Supervisors	10
6.3 HSE Managers and Supervisors.....	10
6.4 Senior Line Managers	10
7.0 VARIANCES	11
8.0 UPDATES TO THIS DOCUMENT	11
9.0 ATTACHMENTS	11
9.1 Flowchart	12
9.2 Example Fatigue Assessment	13

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1.0 PURPOSE

The purpose of this Procedure is to assist in the assessment of the causes of fatigue and mitigate the related hazards for BHP Billiton Petroleum Personnel.


2.0 SCOPE

This Procedure applies to all BHP Billiton Petroleum Personnel. Contractors not working under direct BHP Billiton Petroleum supervision must have an equivalent system that meets the intent of this procedure and complies with relevant industry standards.

3.0 REFERENCES

[Petroleum HSE Management System Element 13 – Health and Hygiene](#)
[Petroleum HSE Risk Matrix](#)

PHSE-13-P06	CONTROLLED DOCUMENT Page 3 of 13 <small>Printed copies of this document are not controlled. To verify this copy is current, check the Petroleum Portal.</small>	Rev. 0.1
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<p>Petroleum</p>	<p>Health, Safety & Environment Management System</p> <p>Fatigue Management</p>	
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4.0 DEFINITIONS

Active Management – Temporary controls used to manage fatigue risks in a short term situation. Example: Assigning an employee to work adjacent the person of concern and monitor for signs of fatigue.

ALARP – As low as reasonably practicable.

Circadian Low – Hours between 2am to 6am and 2pm to 4pm where maximum sleepiness occurs in a 24 hour cycle.

Circadian Rhythm – Natural cycle of human physiology that fluctuates over a 24 hour period.

Company Travel – Travelling on behalf of BHP Billiton Petroleum.

Core Office Hours – Business hours where personnel are normally required to be present at the workplace.

Extended Work Hours – Hours worked beyond the planned work shift.

Fatigue – A state of impaired physical and/or mental performance and lowered alertness arising as a result of inadequate restorative sleep.

Micro-Sleep – Brief, unintended episodes of loss of attention associated with events such as blank stare, head nodding, prolonged eye closure, etc.

On-call/Call Out – The individual is not scheduled to work but on standby in the event their service is required.

Personnel – Employees and contractors working under the direct supervision of BHP Billiton Petroleum.

Responsible Line Manager or Supervisor - The direct supervisor/manager of the work activity. This will normally be the supervisor/manager of personnel or the contract sponsor.

Restful Sleep – A period of sleep that allows the human body to recover from the effects of fatigue.

Senior Line Manager - Production Unit Manager, Worldwide Drilling Manager, Project Director, Exploration Manager.

Senior Manger – The most senior person on-site.

Shall or Must – Means a mandatory requirement.

Should – means a guideline that is strongly recommended.

Sleep Debt – Occurs when an individual does not achieve adequate restorative sleep. A sleep debt can accumulate over a period of nights of inadequate sleep or a single night without sleep.

<p>PHSE-13-P06</p>	<p>CONTROLLED DOCUMENT</p> <p>Page 4 of 13</p> <p>Printed copies of this document are not controlled. To verify this copy is current, check the Petroleum Portal.</p>	<p>Rev. 0.1</p>
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Sleep Disorder – There are many medically-defined sleeping disorders such as insomnia and obstructive sleep apnea. A sleep disorder affects the ability of an individual to obtain adequate rest and increase the likelihood of fatigue.

Sleep Opportunity – The time available for sleep in a 24-hour period. Work time and commute time are not available for sleep and are therefore, not included in the sleep opportunity.

Work Cycle – The number of consecutive scheduled shifts.

<p>PHSE-13-P06</p>	<p>CONTROLLED DOCUMENT</p> <p>Page 5 of 13</p> <p>Printed copies of this document are not controlled. To verify this copy is current, check the Petroleum Portal.</p>	<p>Rev. 0.1</p>
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<p>Petroleum</p>	<p align="center">Health, Safety & Environment Management System</p> <p align="center">Fatigue Management</p>	
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5.0 PROCEDURE

5.1 Introduction

Fatigue is a complex issue that not only arises from hours of work and activities at the work place but it is also influenced by factors outside of work (e.g. family responsibilities, stress, lifestyle, personal health, etc.). The management of fatigue is a shared responsibility between management and each individual.

Signs of fatigue include long eye blinks, repeated yawning, frequent blinking, bloodshot eyes, poor reaction time, slow speech, loss of energy, and an inability to concentrate. Fatigue can result in a lack of attention, difficulty following instructions, reduced ability to think clearly, and slower response to changing circumstances. Chronic fatigue can also lead to long term health issues.

Most adults need 7 to 8 hours of sleep in every 24 hours to feel well rested. A sleep debt is built up by routinely getting less than 7 to 8 hours of sleep per night. This debt may result in impaired performance, reduced alertness and higher levels of sleepiness and fatigue. A sleep debt can only be repaid with restful sleep.

Fatigue contributes to accidents by impairing performance and in extreme cases causing people to fall asleep. Fatigue related “micro sleeps” are very hard to predict or prevent and can place the individual and others safety at risk.

Managing fatigue requires the following measures to be undertaken:


- Complete a fatigue risk assessment.
- Create a management plan to eliminate or mitigate, with controls, identified risks.
- Ensure personnel are educated and informed of fatigue risk.

5.2 Risk Assessment

A fatigue risk assessment must identify the impact of fatigue risks, taking into account relevant local regulations. Fatigue risks must be assessed as *Tolerable*, *Intermediate*, or *Intolerable*.

- *Tolerable* – Controls in place are adequate to mitigate the risks and do not need active management.
- *Intermediate* – Controls require active management while tasks are being performed.
- *Intolerable* – Must be addressed with additional controls and reassessed.

<p>PHSE-13-P06</p>	<p align="center">CONTROLLED DOCUMENT</p> <p align="center">Page 6 of 13</p> <p align="center"><small>Printed copies of this document are not controlled. To verify this copy is current, check the Petroleum Portal.</small></p>	<p align="center">Rev. 0.1</p>
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<p>Petroleum</p>	<p>Health, Safety & Environment Management System</p> <p>Fatigue Management</p>	
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5.2.1 Assessment of Control Effectiveness

Effectiveness of Controls must be demonstrated by following the [HSE Risk Matrix](#) process 5.3 *Demonstration of Adequacy*. Control effectiveness can also be determined by examining reports of fatigue and incidents where fatigue is a factor. Compliance with fatigue management requirements must be assessed to ensure controls are in place and operating effectively. Deficient controls must be remedied in a timely manner.

Any risks deemed *Intolerable* must be addressed with additional controls which allow a reassessment of *Tolerable* or *Intermediate*. Completed assessments must not contain risks assessed as *Intolerable*.

The risk assessment and management plan must be documented and reviewed when work schedules or job roles are significantly modified. A fatigue management plan is any document that is used to address the identified risks in the risk assessment. An example risk assessment is provided in Attachment [9.2](#).

5.2.2 Operational Work Schedules/Rosters


The risk of fatigue can be significantly reduced by effective planning and resourcing of work shifts, work cycles and rotations. Each Responsible Line Manager must ensure that schedules, work cycles or job roles are assessed for fatigue risks. The following items must be assessed at a minimum:

- Are safety critical tasks planned during “circadian low” hours, 2am - 6am and 2pm- 4pm?
- Are complex tasks planned on the first or final shift of a nightshift work cycle?
- Are standby and on-call duties limited where possible?
- Does day shift start before 6am?
- Is the maximum number of shifts in a work cycle in line with relevant industry practices and regulatory standards?
- Do extended shifts (> 12 hours) occur more than three times in a work cycle?
- Do shifts rotate backwards (day to night to afternoon)?

5.2.3 Office Work, Business Travel and Commute Time

Office work, business travel, and commute time have associated fatigue risks that must be managed. Business travel to operational sites must be managed through local journey management plans. General business travel must be managed through fatigue

<p>PHSE-13-P06</p>	<p>CONTROLLED DOCUMENT</p> <p>Page 7 of 13</p> <p>Printed copies of this document are not controlled. To verify this copy is current, check the Petroleum Portal.</p>	<p>Rev. 0.1</p>
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<p>Petroleum</p>	<p align="center">Health, Safety & Environment Management System</p> <p align="center">Fatigue Management</p>	
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risk assessments. Commute time and core business hours for office locations must also be assessed. The following items must be assessed at a minimum:

- Do office schedules regularly exceed 14 hours per day, including the lunch break and total commute time?
- Do core office hours regularly exceed 80 hours in a two week period?
- Are opportunities for car/van pooling or use of public transport available?
- Does business air travel occur where total travel time from home to destination is > 14 hours?
- For business related ground travel, are alternatives to self-drive available?

5.3 Risk Controls

Risk controls for mitigating fatigue must be applied using the hierarchy of controls. The number of employees at risk and the level of risk must be considered when implementing controls.


5.3.1 Rest

Rest is the most important control measure for managing fatigue. Time spent away from the immediate work environment allows workers to recover from fatigue, thereby improving work performance, vigilance, safety and efficiency. Conditions for restful sleep must be provided and breaks must be taken during the work shift and not be traded for an early finish time for the shift.

To provide adequate rest consider the following:

- Is a ten hour or longer break between work shifts provided?
- Does the break between work shifts provide a sleep opportunity of 7 or more hours of continuous sleep?
- Is a minimum of one break provided between each 4 hours of work with one break of sufficient length to have a meal (i.e. 30 minutes)?
- Are more frequent short breaks allowed during strenuous activities?
- Is ready access to drinking water provided?
- Do Call-Out/On Call schedules provide for adequate rest before returning to a regular work shift?

<p>PHSE-13-P06</p>	<p align="center">CONTROLLED DOCUMENT</p> <p align="center">Page 8 of 13</p> <p align="center"><small>Printed copies of this document are not controlled. To verify this copy is current, check the Petroleum Portal.</small></p>	<p align="center">Rev. 0.1</p>
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5.4 Training – Awareness

Induction

Awareness level training must be provided to all personnel. The purpose of this training is to provide information and education related to the risk factors and signs of fatigue. The training will assist all personnel to recognize the symptoms of fatigue and manage fatigue risks in a safe manner. As a minimum, the training topics must enable the individual to:

- Understand responsibilities and know how to recognize the effects of fatigue in themselves and others.
- Understand the influences of a healthy lifestyle and non-work activities on fatigue.
- Understand the effects of medical conditions, sleep disorders, and drugs and alcohol.
- Understand how to apply personal countermeasures to managing fatigue.
- Understand and accept their responsibility to use their recovery time effectively and present rested and fit for work when their work shift begins.

Ongoing

Awareness level training must be presented to all employees every two years to ensure a minimum level of understanding.


5.5 Training – Supervisory Roles

Induction

Supervisory level training must be provided every two years and at the commencement of a supervisory role. The purpose of the training is to provide the skills and information to implement fatigue management principles in the daily operation of their assigned duties. This training will also assist supervisors to recognize and manage fatigue risks with their direct reports. Training topics must include those contained in the awareness level training and the following:

- Understand responsibilities and when to initiate fatigue controls.
- How to manage employees who present signs of fatigue.

<p>PHSE-13-P06</p>	<p>CONTROLLED DOCUMENT</p> <p>Page 9 of 13</p> <p>Printed copies of this document are not controlled. To verify this copy is current, check the Petroleum Portal.</p>	<p>Rev. 0.1</p>
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<p>Petroleum</p>	<p>Health, Safety & Environment Management System</p> <p>Fatigue Management</p>	 <p>bhpbilliton resourcing the future</p>
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6.0 RESPONSIBILITIES

6.1 All Personnel

- Present fit for work at the commencement of and during the work period.
- If not fit for work then notify their supervisor to ensure that an appropriate risk mitigation process is implemented.
- Comply with this fatigue management procedure.
- Monitor for the signs and symptoms of fatigue in their co-workers and team members.
- Communicate and report personnel fatigue issues to their Supervisor.

6.2 Responsible Line Managers or Supervisors

- Ensure that persons under their control are aware of and comply with this procedure.
- Ensure that applicable work schedules comply with this procedure.
- Monitor personnel for the signs and symptoms of fatigue.
- Approve controls for managing fatigue.
- Conduct a review of any fatigue-related incidents and the effectiveness of existing control measures as required.

6.3 HSE Managers and Supervisors

- Provide timely advice, support and assistance to Responsible Line Manager or Supervisors in the implementation of this procedure.
- Conduct a review of fatigue risk assessments and the effectiveness of existing control measures as required.
- Ensure that fatigue related incidents are reported and fatigue is considered during incident investigation.

6.4 Senior Line Managers

- Approve extended work hours of greater than three shifts per work cycle.
- Approve the variance procedure process as necessary.

<p>PHSE-13-P06</p>	<p>CONTROLLED DOCUMENT</p> <p>Page 10 of 13</p> <p>Printed copies of this document are not controlled. To verify this copy is current, check the Petroleum Portal.</p>	<p>Rev. 0.1</p>
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7.0 VARIANCES

Any planned deviations from the requirements of this procedure shall be recorded on [Petroleum HSE Variance Form](#) and submitted to [Petroleum HSE Systems Support](#).

Variations to this procedure must be approved by:

1. Senior Line Manager
2. HSE Occupational Health and Hygiene Manager
3. Vice President HSE

8.0 UPDATES TO THIS DOCUMENT

This is a Petroleum HSE Controlled Document. Requests for updates to Petroleum HSE Controlled Documents shall be documented on the [Petroleum HSE Document Proposal and Review Form](#) and sent to the [Petroleum HSE Systems Support](#) email in the GAL.

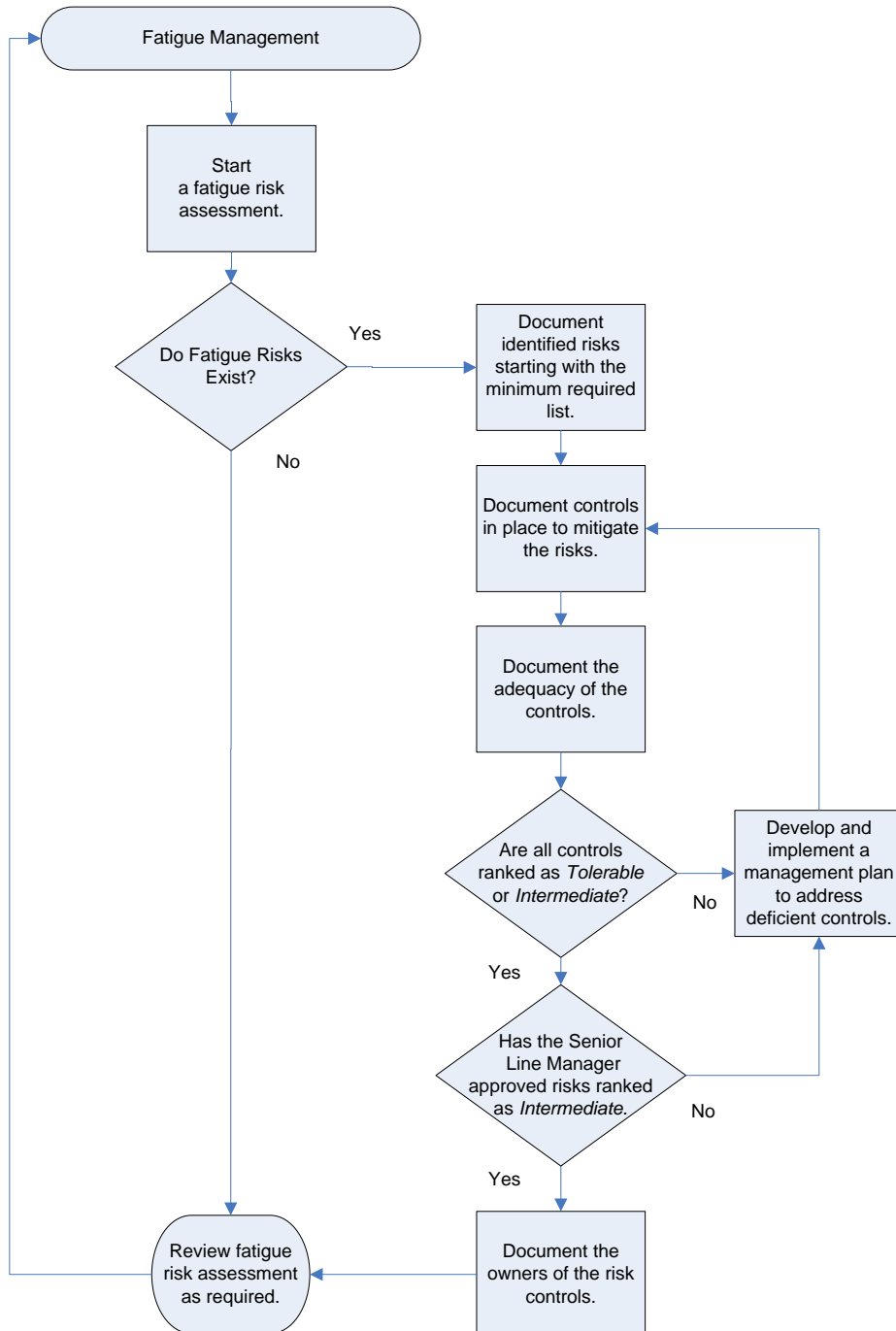
9.0 ATTACHMENTS

9.1 Flowchart

9.2 Example Assessment

<p>PHSE-13-P06</p>	<p>CONTROLLED DOCUMENT</p> <p>Page 11 of 13</p> <p>Printed copies of this document are not controlled. To verify this copy is current, check the Petroleum Portal.</p>	<p>Rev. 0.1</p>
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9.1 Flowchart



9.2 Example Fatigue Assessment

Fatigue Risk	Impact	Controls	Adequacy	Approval
<i>Safety critical tasks occur during circadian low hours.</i>	<i>Increased potential for a fatigue related incident.</i>	<i>Provide an adequate sleep opportunity. Provide adequate breaks.</i>	<i>Intermediate</i>	<i>Responsible Line Manager</i>
<i>Sleep interruption due to on-call duties.</i>	<i>Interrupted or inadequate sleep</i>	<i>Provide additional rest time before returning to the regular shift.</i>	<i>Tolerable</i>	<i>Supervisor</i>
<i>Extended shifts occur more than 3 times in a work cycle.</i>	<i>Increased potential to accumulate a sleep debt.</i>	<i>Provide an adequate sleep opportunity. Provide adequate breaks.</i>	<i>Intermediate</i>	<i>Responsible Line Manager</i>
<i>Business air travel occurs where total travel time is more than 14 hours.</i>	<i>Traveler will be too fatigued to drive.</i>	<i>Taxi service is provided at the destination.</i>	<i>Tolerable</i>	<i>Supervisor</i>