



DrillSafe Forum – June 2009 Sydney

A review of Fatigue Management practices in safety critical industries

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– Review of Fatigue Management Practices
LLOYD'S REGISTER RAIL



What is fatigue ?

- Symptoms include:
 - Not feeling refreshed after sleep
 - Difficulty keeping eyes open or remaining focussed
 - Loss of concentration
 - Feeling irritable, restless and impatient
 - Muscle weakness/ tiredness
- Effects of fatigue may include:
 - Lack of attention/ Reduced alertness
 - Memory lapses
 - Reduced problem solving ability
 - Change in attitude/ mood
 - Impaired performance, e.g., increased reaction time
 - Human error



Potential contributory factors

- Fatigue may be caused by a range of factors including:
 - Sustained mental or physical exertion
 - Long periods awake
 - Not enough sleep, or not enough restorative sleep
 - Amount and duration of work
 - Inadequate rest breaks and
 - Environmental stresses (heat, noise and vibration).
- These factors may be compounded by:
 - A person's circadian rhythm ('body clock')
 - Environmental stress
 - Age
 - Life away from work (family and friends, socio-economic factors, commuting etc)
 - Personal health and fitness.

Why manage fatigue?

- Important to manage the risk associated with fatigue due to the potential safety consequences
 - Three Mile Island
 - Texas City
 - Exxon Valdez
 - Clapham Junction
 - Selby
 - Waterfall



Why manage fatigue?

- Regulatory requirements require development and implementation of strategies to control risks associated with fatigue for rail safety workers.
- Limited guidance provided for the oil and gas industry
- Underestimation of risk - 'No blood test for fatigue'

Approaches to Fatigue Management

- Fatigue Management practices differ from operator to operator based on level of risk
- Traditional approaches
 - Prescriptive regulatory approach – maximum duty periods and minimum rest periods
- Modern approaches
 - Risk based
 - Systemic
 - Recognition that fatigue management entails more than managing hours of work
 - Shared responsibility

Fatigue Management within the Safety Management System



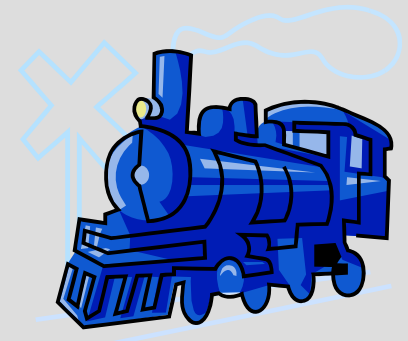
Adapted from NTC, 2008

Rail Industry – Australian regulations

Regulation 36 (*Rail Safety Regulations 2006*)

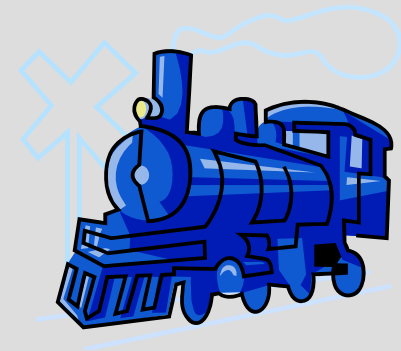
“Rail operator must develop and implement strategies for the control of risks to safety associated with fatigue of rail safety workers”

- Strategies must include work arrangements that eliminate fatigue SFARP and may include:
 - Maximum work hours
 - Minimum rest times
- Rail operator must consult when developing strategies



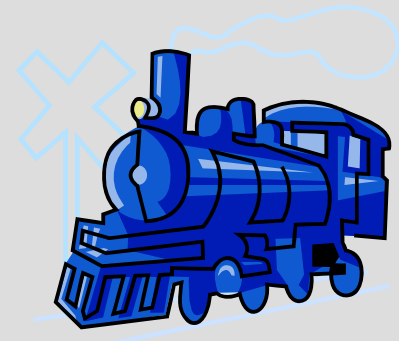
Rail Industry – Australian guidelines and policies

- National Transport Commission (NTC) published a set of best practice guidelines including guidance on:
 - Rostering principles
 - Fatigue management training
 - Risk assessments and risk treatments
 - Evaluating the effectiveness of risk treatments
- Australian Council of Trade Unions (ACTU) produced the H&S Guidelines for Shift Work and Extended Working Hours which included guidance on:
 - Developing safe procedures
 - Identifying hazards
 - Risk assessment factors
 - Measures to control the risks
- No legal duties imposed



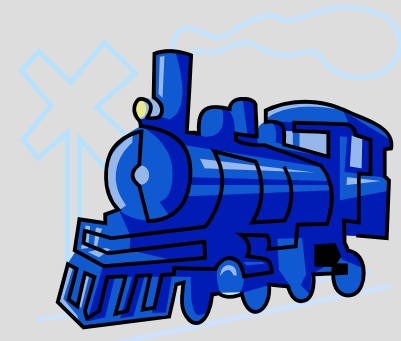
Rail industry – UK regulations

- Office of Rail Regulation audits operators to ensure compliance with relevant legislation
- ORR produced guidance specifying nine high level stages:
 1. Identifying safety critical workers impacted
 2. Setting standards and designing working patterns
 3. Limiting exceedances
 4. Consulting with safety critical workers
 5. Recording the arrangements
 6. Providing information/ training to safety critical workers
 7. Monitoring and recording
 8. Taking action when safety critical workers are fatigued
 9. Reviewing the arrangements



Rail industry – UK guidelines and operations

- The Rail Safety Standards Board (RSSB) provides a Good Practice Guide to compliment the guidance produced by the ORR on managing fatigue in safety critical work. Includes guidance on:
 - Recommended working limits
 - Fatigue countermeasures for drivers
 - Guidelines for fatigue monitoring
- Network Rail – Large Passenger Operator which employs a number of practices and approaches to manage fatigue in rail safety workers
 - Use of a tool to review master rosters and actual rosters
 - Standards to control working hours
 - Rostering principles
 - Training in fatigue management
 - Guidance on commute times
 - Accident and incident investigations



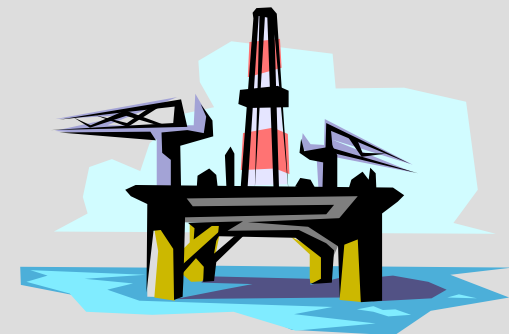
Maritime – International guidance

- The International Maritime Organisation (IMO) developed and published a set of guidelines on fatigue management and mitigation.
- Guidelines provide practical guidance to assist operators in how to manage fatigue.
- Tailored modules covering:
 - The symptoms and causes of fatigue
 - Organisational and individual responsibilities for managing fatigue
 - Solutions to combat fatigue e.g. environmental factors, strategic napping, rest times between shifts, shift length
- A basis for operators to develop information for dissemination



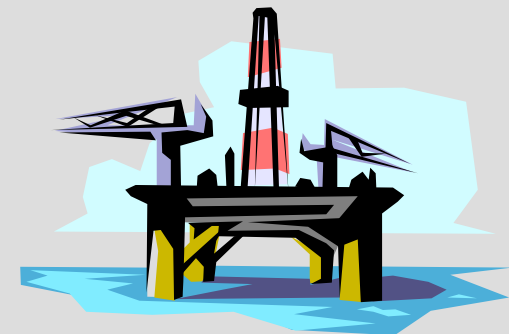
Oil and Gas Industry - International

- International Petroleum Industry Environmental Conservation Association (IPIECA) also provide guidelines on fatigue management within Oil and Gas industry
- Provides information on:
 - Sleep and the body clock
 - Shift work
 - Health and sleep disorders
 - The main causes of fatigue and strategies for managing the causes.
- Focus on understanding and recognising fatigue
- Not risk based

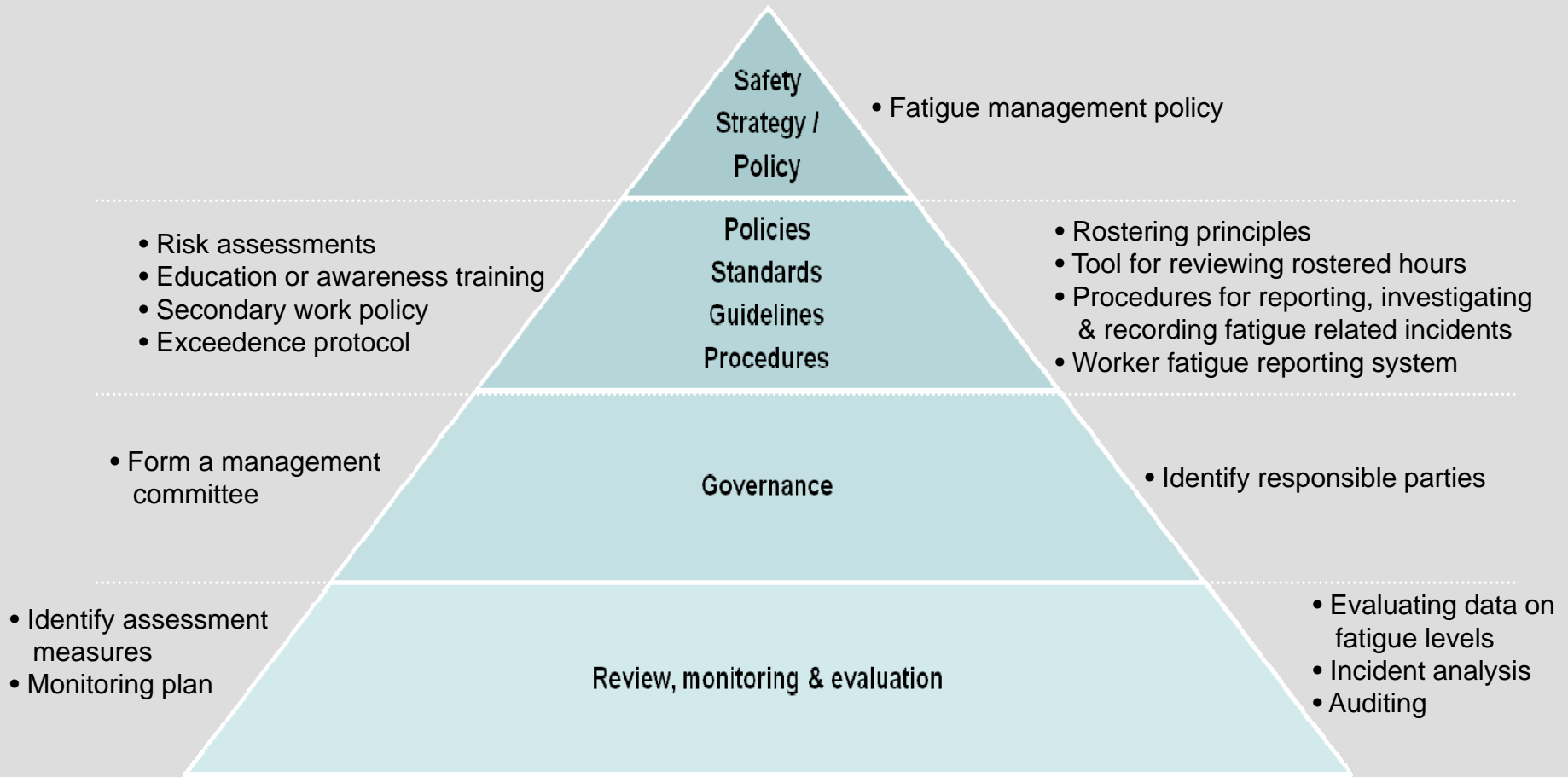


Offshore Oil and Gas - UK

- UK Health and Safety Executive (HSE) provides guidance on managing shift-work and fatigue in offshore workers.
- Provides advice relating to working practices in the UK offshore sector on:
 - Integration of fatigue management practices within an SMS
 - Planning and implementation (e.g. carrying out risk assessments to identify fatigue risks)
 - Consideration of shift work policies
 - Documenting shift work procedures
 - Monitoring performance
 - Auditing and review of performance



Practical Application of Fatigue Management Guidelines



Adapted from NTC, 2008

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