

# The Impact of Fatigue Management on Your Enterprise

*A WorkTech White Paper*

***Fatigue Management and Compliance, including API RP-755 is an important way for companies to protect their workers, protect themselves, and improve productivity. This White Paper describes the process of Fatigue Management and the benefits for companies using it.***

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# Fatigue Risk Management - What is it? How can it help?

## 1. Introduction

Worker fatigue can and does rear its' ugly head in a multitude of asset intensive industries with serious ramifications. The consequence of less alertness leads to slowed reaction times, reduced vigilance, poor decision making and lack of communication. In extreme cases this may contribute to incidents and accidents that could be catastrophic. Unless individuals actually fall asleep, the incident or accident is normally a combination of faulty decision making within a critical situation. Research by Professor David Dinges at University of Pennsylvania showed that fatigue contributes between 30 and 90% of all serious incidents across industries.

A few examples of decreased alertness during the duty period may be in the form extended work hours on a shift, continuous days of long shifts, deprived sleep, night shifts, and workers having to take on unscheduled labor time. For night workers, this is exacerbated by naturally decreasing performance that is driven by the circadian rhythm. (see Wikipedia on circadian rhythm) and there is unlikely to be any improvement due to adaptation. The level of sleep shortages varies with the individual and becomes more pronounced with aging but it is likely that some adverse effects will persist in just about any age.

Working hours are controlled by a variety of prescriptive schemes in most countries in the world: The European Union introduced their working time directive to guide all workers apart from military personnel and aircrew; the latter having had customized schedules in place for decades. In addition, a number of unions have negotiated terms to restrict duty times to cover specific industries and occupations. Health workers are particularly affected by this approach, as medical staff can no longer use on call duties to increase their availability for work. This leads to a shortage of doctors at night and during the weekends. A recent report claimed that deaths in UK hospitals increase by 10% at weekends due to the lack of sufficient doctors to cover these periods.

Keeping track of worker fatigue means understanding when someone worked in the past and when they are supposed to work in the future. The most important measurement is the rest period – the time between when a worker has stopped working and the time that he or she comes into work the next day. Managing those times is critical to managing worker fatigue.

## 2. Complementing Best Practices

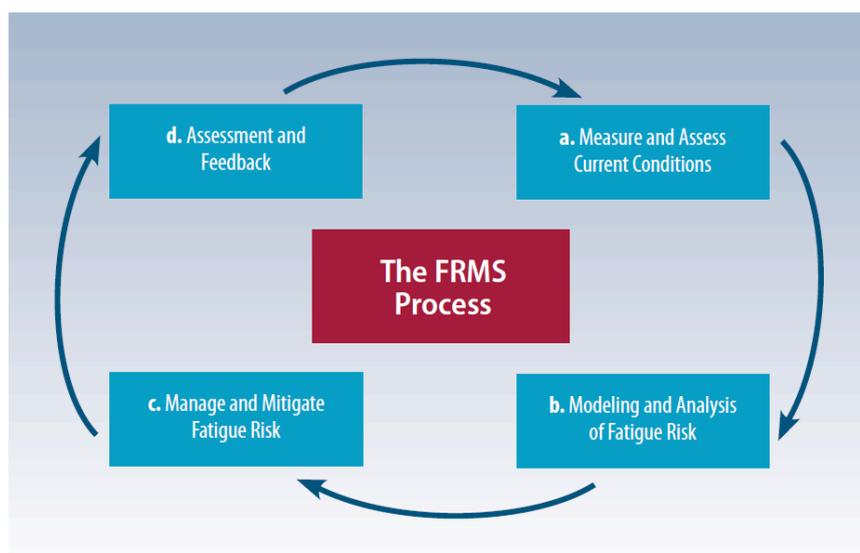
In July 2008 the American Petroleum Institute (API) and the United Steel Workers worked together to develop Fatigue Prevention Guidelines that would – at a minimum – limit hours and days of work and address shift work. Also, the American National Standards Institute (ANSI) has developed Fatigue Prevention Guidelines for the refining and petrochemical industries that, at a minimum, limit hours and days of work and address shift work.

This resulted in standard RP 755 in April 2010 and provides guidance to all stakeholders (e.g. employees, managers, supervisors) on understanding, recognizing and managing fatigue in the workplace. Owners and operators should establish policies and procedures to meet the purpose of RP. This document was developed for refineries, petrochemical and chemical operations, natural gas liquefaction plants, and other facilities such as those covered by the OSHA Process Safety Management Standard, 29 CFR 1910.119. The document is also intended to apply to a workforce that is commuting daily to a job location.

ANSI RP 755 applies to all employees working night shifts, rotating shifts, extended hours/days or call outs involved in process safety sensitive actions. It should also be considered for others making process safety-sensitive decisions. On-site contractors involved in process safety sensitive actions shall have fatigue risk management systems equivalent to the criteria outlined in this document.

A further important element – in fact a prerequisite – for successfully implementing a FRMS is the adoption of a culture that empowers employees to make safety related decisions that impact operational performance sensibly, responsibly and without fear of retribution, in other words an open communication culture where everyone understands the importance and impact of risks related to fatigue.

We see more and more that FRMS is – or will become – a part of an integrated solution around the Health, Safety & Environment (HSE) system. The FRMS process can be best described in the diagram below:



### 3. Some History on FRMS

In the 1970's there was an explosion of research into sleep performance and fatigue. In the early 1980's there were Congressional Hearings on Biological Clocks and Shift Work Scheduling. The first International Shift Work Symposium was held in 1979 in San Diego. The recognition of the effects of fatigue on safety can be seen from the number of Federal Investigations of fatigue related accidents in transportation and other industries since 1984.

In 2002 the New South Wales Rail Safety Act (Australia) adopted Fatigue Management processes as a regulation. This incorporates fatigue as a workplace hazard to be controlled, Duty of Care for managers and employees and Medical pre-placement requirements all within the Occupational Health & Safety (OH&S) legislation. Duty of care is within a shared responsibility model.

In May 2009, an initial meeting was held at QinetiQ, UK with presentations about FRMS from European Aviation Safety Agency (EASA), EasyJet, QinetiQ, Civil Aviation Safety Authority (Australia), Air New Zealand and Flight Global. The feedback was positive and it was agreed to continue with structured follow-up activities for all companies that are professionally interested in contributing in the development, implementation and promotion of FRMS best practices.

These follow-up activities were structured in a group called: *Forum* and were focused on organizing regular events typically open for airline, rail companies, healthcare, employee groups, independent FRMS consultants, software suppliers as well as regulators. Please see for more specific information on their activities on [www.frmsforum.org](http://www.frmsforum.org)

Today we see many safety-sensitive companies are tending towards more risk-based views on this topic and therefore adopting a holistic approach to leverage the optimal benefits from the Fatigue Risk Management solution, including incident investigation, fatigue diagnostics, policy and strategy reviews and (internal) training/education.

## 4. Focused Industries

Because of the potential impact of fatigue on health, safety, and productivity, any organization in which individuals work extended hours or hours during which people typically sleep can benefit from addressing fatigue in the workplace.

This is particularly important for safety-sensitive operations such as in the (rail) transportation, healthcare, oil and gas, chemicals, and energy (nuclear) industries, but really the entire process and discrete manufacturing industries. Mainly speaking, in 24/7 Operations or industries where continuous processes require a vigilant 24/7 workforce, and the high level of automation (of services) makes critical monitoring highly monotonous.

Below are some examples where the importance of FRMS has been recognized within leading (industry) authorities:

### Aviation

President Obama signed H.R. 5900 into law on August 1, 2010, requiring every US airline to develop an FRMS plan by October 31, 2010. FRMS is a recommended practice in the Aviation Sector (International Civil Aviation Organization)

From Regulators:

- ICAO formed a task force comprising airline operations, aviation medicine and sleep science to create guidelines<sup>2</sup> for airline operators and the regulatory community. They announced their guidelines on 30th and 31st August 2011 and released them for adoption by member states on 15th December 2011.
- EASA plan to follow the ICAO guidelines and enact these regulations into European Law during the second quarter of 2012. It is likely that EASA will permit the introduction of FRMS as an alternative to new prescriptive rules that are about to be introduced. They will however, insist that if FRMS is chosen then a full FRMS must be adopted and audited.
- Federal Aviation Authority (FAA) announced their new rule on 21st December 2011
- The UK Civil Aviation Authority (CAA) is already at the forefront of FRMS implementation and was part of the ICAO task force. They have already aligned their processes with ICAO and EASA guidelines and are ready to receive FRMS applications from airlines.
- Chile is the most advanced regulator in South America with Argentina and Brazil not too far behind whilst in South East Asia, Malaysia and particularly Singapore have made strong progress ahead of the other countries.

## **Chemical**

Oil/Petrochemical: The American Petroleum Institute (API) published ANSI Standard RP-755 in 2010 requiring all US refining and petrochemical operations covered by the OSHA Process Safety Management Standard to implement a comprehensive FRMS.

## **Rail/Transportation**

The UK Rail Safety and Standards Board (RSSB) are working closely with the Office of Rail Regulation in the UK to create guidelines on managing fatigue in the UK Rail industry.

## **Healthcare**

The most well-documented healthcare model of a comprehensive FRMS is that of Queensland Health in Australia. Its belief that fatigue is an occupational hazard that needs to be managed just as hospitals would manage hazardous chemicals led to the implementation of the Queensland Health Medical Fatigue Risk Management Policy in 2011. This policy was developed with the intent of minimizing the risk of patient harm caused by fatigue and keeping employees and the work environment healthy and safe. At each level, the staff and leadership can gather data and determine what controls, if any, need to be implemented to alleviate fatigue.

## **Mining**

The Tasmanian Minerals Council in Australia published its *Fatigue Risk Management Guide* in 2004, and the New South Wales Mines Safety Advisor Council established a group in 2008 to develop a fatigue risk management standard for the New South Wales mining industry which was published in 2009.

## 5. Benefits of using FRMS

Organizations cannot eliminate fatigue, but they can *effectively manage the risks associated with it*. There are different tools and systems available that manage the different components in order to eliminate risk and increase safety and quality outcomes. There are many advantages for implementing an FRMS for all stakeholders. These may include:

### **Risk Reduction**

An organization using FRMS will be identifying hazards and reducing risk to all stakeholders. Those at risk can be educated and take steps to mitigate the effects of fatigue whilst on duty. Those who engage with fatigued people will be educated in recognizing the signs of fatigue and have the opportunity to change their normal approach to accommodate fatigue driven behaviors in order to be more effective in their direction, communication and management.

### **Increase Labor Productivity, Employee Satisfaction and Customer Service Levels**

FRMS can increase labor availability and promote more employee engagement leading to a happier workforce and higher output per employee. Mistakes cost money to correct and are disruptive. Fewer mistakes lead to a more productive workforce that have a higher sense of achievement and pride in their work by getting things right first time; reducing QA engagement and discord with management. More, the direct and consequential costs for correction are avoided completely and customer service levels increase.

### **Managing Sick Leave**

FRMS focuses on fatigue related sick leave data, which should reveal issues with particular shift and highlight sleep disorders. Management action can then be brought to bear to resolve such issues.

### **Increase Flexibility**

FRMS can give the personnel or scheduling department the tools to adjust duty periods or if appropriate by choosing stand by staff according to least level of fatigue. The availability of statistics and information will assist with managing the events on the day thereby increasing flexibility of an operation.

## Summary

Fatigue Management is a process, and an enterprise FMRS solution should be integrated into an existing technology footprint such as ERP or EAM allowing companies to leverage existing investments, while ensuring compliance and minimizing risk. Bottom line; it allows companies to go beyond guesswork and ensure that all governmental and industry fatigue risk management standards are met.

For more information on how a FRMS can work for your organization visit: [www.worktech.com](http://www.worktech.com) or e-mail: [info@worktech.com](mailto:info@worktech.com).

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