House of Representatives Standing Committee on Communications, Transport and the Arts

Inquiry into
Managing Fatigue in Transport

Submission by

FreightCorp

Freight Rail Corporation
126 Church Street
PARRAMATTA NSW 2150

Telephone (02) 9843 9545
Facsimile (02) 9843 9292
Email: dattlee@freightcorp.com.au

REQUESTS

FreightCorp requests that the Committee recommend:

a) The recognition of fatigue as a legitimate workplace hazard;

b) Legislation should be enacted to enable consistent application of fatigue management principles to all modes, including bus and truck operations in all jurisdictions;

c) Increased Government funding for research into fatigue and its effects on safety, and raising public awareness of fatigue.

INTRODUCTION

Fatigue management has emerged as one of the key issues facing the Australian and global transport industry today, as in all industries that utilise shiftwork.

FreightCorp recognises:

1. Its responsibility to employees and the public to manage fatigue in the workplace by providing an environment and safe systems of work which ensure employee health, safety and well being.

2. Fatigue management practices may affect costs of operation. In a highly contestable market, economic efficiency requires a competitively neutral approach to fatigue management across all modes.

Views expressed in this submission are FreightCorp's and are not necessarily those of the NSW Government.

CAUSES OF FATIGUE

In 1995, FreightCorp (as part of the State Rail Authority) was a founding member of the Australian rail industry consortium (comprising National Rail Corporation, Queensland Rail, VLine Freight, WestRail and the Public Transport Union) studying fatigue related issues for train crews. The consortium was formed in recognition of the need to manage fatigue on an industry level and to fund the Centre for Sleep Research (CSR) at the University of Adelaide to conduct a National Train Crew Shiftwork & Workload Study (NSWS).

FreightCorp became involved in the consortium because it recognised the need to manage fatigue, particularly with the current "blank line"[1] rostering practices and highly conditional, customer based train scheduling. As a consortium member, FreightCorp has worked closely with the CSR, including supplying industry access for the research.

[1] FreightCorp relies on "blank line" rostering whereby the majority of train crew work is allocated on a daily basis and the individual has a blank line of roster with only duty free days posted.

The first three year stage of the NSWS is now complete, with the final report published in September 1998. Since receiving the report, FreightCorp, using the CSR as a resource, has been actively working with shiftwork employees, their families and union representatives in addressing both the work related and non-work related findings. A summary of the findings to date of the study are included as Attachment 1. Also relevant is other research indicating that regulations based only on restricting working hours are not effective in necessarily controlling fatigue[2].

EFFECTS OF FATIGUE

The most recent data on the costs of road and rail accidents was prepared by the BTE using 1993 data[3]. This indicated the total cost of accidents as:

Road	$6 billion
Rail	$69 million

More detailed research on the contribution of freight transport to these accident levels shows that freight traffic was a significant contributor, with heavy road vehicles involved in 10% of all accidents[4]. It is estimated that freight related fatalities were as follows:

Road	8 fatalities/billion gross tonne kilometres ("gtk")
Rail	1 fatality/billion gtk

The link between driver alcohol levels and accident levels are well established. Studies suggest alcohol was a factor in one third of all road fatalities in 1996[5]

Research into the effects of fatigue are less extensive. However a number of studies show significant linkages. Researchers[6] have suggested that 24hr sleep deprivation has a greater impairment than a moderate blood alcohol level (0.05-0.08% Blood alcohol concentration). For accidents in general, New South Wales data [7] suggests fatigue is a factor in 18% of NSW fatal road accidents, whilst US research found 20-25% of freeway accidents, and 40% of fatalities[8] were caused by fatigue.

The contribution of fatigue to road freight accidents is even greater. US research found fatigue was a primary contributor in 40% of truck accidents, and a secondary factor in 60% of

[2] Hartley, L. & Arnold, P., *Submission to the Inquiry into Managing Fatigue*, (1999), Murdoch University, Western Australia.
[3] Bureau Transport Economics, 1993, Information Sheet 4 & 7.
[4] Laird, P. Updating National Heavy Vehicle Charges, 1998, Information Paper.
[5] Federal Office of Road Safety, 1996, *Alcohol and Road Fatalities*, Monograph 10.
[6] Dawson, D & Reid, K. Fatigue, alcohol and performance impairment. *Nature* 1997, 388: 235. Sourced via Adam Fletcher, The Centre for Sleep Research.
[7] Roads and Traffic Authority, Road Traffic Accidents in NSW 1997
[8] Shafer, J.H. The decline of fatigue related accidents on the NYS thruway. Proceedings of the Highway Safety Forum on Fatigue, *Sleep Disorders and Traffic Safety*, Albany, New York, December 1, 1993; 85-88. Sourced via Adam Fletcher, The Centre for Sleep Research.

serious truck accidents. The National Road Transport Commission suggests fatigue was a factor in 70% of truck accidents[9].

FREIGHTCORP ACTION ON FATIGUE

General Work Practices

FreightCorp crewing practices differ significantly from those in place in other parts of the transport industry. It may assist the Committee to briefly outline these.

In NSW:

1. Train crew are based at a number of Depots around the network.
2. In order to ensure continuity of service, FreightCorp practices may involve breaking train journeys at predetermined points. Under these circumstances;

   - transport may be provided to return the crew to the home depot within the period of allowable working hours; or

   - if this is not feasible, quality accommodation is provided either at FreightCorp owned or approved contracted facilities.
3. Other current rostering practices include mandatory rest days.

Applicable Research Tools

Research findings from the NSWS have provided FreightCorp and other rail operators with the following tools to manage fatigue:

- Validated research protocols that will enable us to obtain accurate and relevant information regarding the sleep, work, biological adaptation, and fatigue levels of drivers working under a variety of conditions.
- Base training and education materials designed to be adapted to specific needs and organisational objectives.
- A fatigue modelling computer package that provides a means of measuring or predicting work related fatigue against planned rosters.
- An extensive database containing a wealth of information regarding driver fatigue, biological adaptation, work schedules, and sleeping patterns.

[9] National Road Transport Commission, Transitional Fatigue Management Scheme Driver Certification Manual, 1998.

Action on Fatigue Minimisation

Fatigue Management Program

FreightCorp is implementing a Fatigue Management program to reduce the fatigue levels of all its shift workers including train crew employees. This program utilises the tools outlined above developed in the NSWS. In summary Fatigue Management in FreightCorp comprises:

1. Participation in a new rail industry consortium which has initiated a further research program until 2002;
2. Forums with all shift workers and their families to discuss fatigue, and the effects of non-work activities on fatigue levels;
3. The development of "fatigue sensitive" rostering practices. The nature of FreightCorp's business requires a high level of service flexibility to meet customer needs. This is reflected in more variable rostering those where all services are scheduled well in advance. In developing rosters increasing application is made of the fatigue principles identified in the NSWS study.

   There is considerable variation in the tasks undertaken by different categories of shiftwork employees. Further work initiated by the NSWS consortium will provide validation of acceptable levels for different tasks. As a transitional arrangement FreightCorp therefore considers that the preferred maximum fatigue index level of 80-90 provides a guide, rather than an absolute maximum, in developing rosters.

   Additionally, changes due to single driver operation are the subject of a special study on fatigue and workload.

Testing

Pre-commencement testing identifies employees who may be affected by alcohol and unable to safely carry out their duties. Personnel involved in any serious accident are automatically tested for alcohol levels. These requirements are a provision of Rail Safety legislation in NSW.

FreightCorp is developing further initiatives to extend the above to include drug testing. Furthermore, one of the new objectives of the Australian Railways Shiftwork and Workload Study (ARSWS) consortium is to develop a cost effective tool to measure performance impairment, including where attributable to fatigue or the presence of drugs or alcohol.

Harm Minimisation

A number of processes are in place in the rail industry to reduce the risks of an incident occurring from any cause including fatigue.

Natural Constraints on Train Separation

By the nature of rail, the task is inherently different and more controlled than for the driver of a comparable road vehicle, where the driver has to control the vehicle, within very narrow lane width tolerances, as well as controlling its speed. Train direction is obviously controlled by the track. Signalling and other control systems assist in regulating the train movement.

Information on Unforseen Hazards

The driver is in regular radio contact with Network Control, who can therefore advise of any non-standard hazards that may be in the train's path, for example, if a wagon on the oncoming track had been derailed. The likelihood of the driver needing to respond to an unforeseen emergency situation is therefore substantially less.

Analysis of Incidents

All incidents are treated seriously even if no damage to property or risk to personnel is present. FreightCorps systems requirements include logging the incident, conducting an investigation into the causes and consequences and reporting the results. These are communicated to senior management for action and follow up monitoring. Additionally, as a requirement of accreditation all rail operators report these incidents (depending on their severity) to the track access owner and regulators including the NSW Department of Transport, WorkCover and where required the Environmental Protection Authority. An example of an incident which may be investigated includes the occurrence of the driver "locking-up" the train wheels due to excessively hard braking.

Driver Safety Systems

The Vigilance Control System requires the driver to respond by pressing a button when required to show alertness. Failure to adequately respond activates the emergency braking to stop the train.

As a result of the Beresfield incident in October 1997 (where a coal train collided with the rear of a stationary coal train) FreightCorp initiated a major review of its locomotive vigilance control system which was conducted by the Monash University Accident Research Centre. FreightCorp is implementing the findings of this study to enhance the operation of the vigilance control system. This will complement and enhance FreightCorps fatigue management program.

ECONOMIC IMPLICATIONS

This submission has already noted the substantial costs that are incurred due to transport accidents. Growing research suggests that a significant portion of transport related accidents are due to fatigue. Fatigue related accidents therefore create a significant social cost to the community.

Further, significant variations in allowable work practices affect operating costs and economically effective choice of transport mode. This can be illustrated through comparison of crewing arrangements for road and rail where the regulatory framework is different. Rail transport from Sydney to Melbourne requires the rotation of two crews over the journey whereas road transport completes the journey with one crew. A shorter transit time due to superior infrastructure is also a factor. These variations have clear and inappropriate implications for economically efficient competition and use of transport modes.

INITATIVES REQUIRED

To address the problems of fatigue in transport, responsibility needs to be taken by individuals who are susceptible to fatigue, organisations whose employees are prone to suffer from fatigue and Governments to providing a uniform approach to fatigue management across modes.

Employees need to take greater responsibility for managing their lifestyles to balance work requirements and personal activities within safe fatigue levels. FreightCorp promotes this approach to lifestyle management by providing educational programs to employees and their families which aim at increasing awareness on the impact of shiftwork on the employees health, safety and well being.

Employers have a responsibility to their employees to ensure fatigue is minimised, and that initiatives are in place to address the consequences of fatigued employees. FreightCorp practice is to provide a safe work environment to meet its duty of care obligations. FreightCorp is addressing fatigue in the workplace through the Fatigue Management Program. Employers should be required to provide training for employees to help them manage their lifestyle so that they are fit to undertake shiftwork.

Governments also have a responsibility to promote a uniform approach to fatigue management across the transport industry. A uniform framework removes economic incentives for companies not to responsibly manage fatigue.

In particular this action should include:

1. The relevant OH&S Acts implicitly require effective management of fatigue. However, fatigue should be formally identified as a workplace hazard with a consequent requirement for a formal program of management.

2. Legislation should be enacted to enable consistent application of fatigue management principles to all modes, including bus and truck operations in all jurisdictions. This would require the phasing out of “hours of work” regulations and their replacement with an effective fatigue management program addressing both work and non-work related fatigue issues, and including appropriate formal auditing.

3. All transport operators should be required by legislation to be accredited. Accreditation criteria should include a requirement for fatigue management programs within the accreditation criteria.

   This reflects the importance attached to a consistent approach to safety across all modes made evident in the Governments formation of the Australian Transport Safety Board.

4. The Government should provide increased financial support for continued research into the effects and social costs of fatigue and development of tools to enable fatigue to be managed within acceptable safe levels for different tasks.

   Funding should also be provided to raise industry and community awareness.

Attachment 1 – NSWS RESEARCH FINDINGS

The following is a short summary of the research findings regarding factors that may affect fatigue levels and personal effectiveness.

Sleep Patterns

- Time of day had a significant main effect on the propensity for sleep in all analysis. With most sleep occurring during the night (2200-0800 hours) peaking in the early morning at approximately 0200 hours, and the least sleep occurring during the day (1000-2000 hours) reaching a low in the early evening at about 1900 hours.

Minimum Break Duration

- Sleep was accumulated more quickly in breaks beginning at night than in breaks beginning during the day. This indicates that time off during the night has greater 'recovery' value than time off during the day. Whilst current minimum-length breaks during the night may provide employees with sufficient opportunity to 'recover' prior to resuming work, minimum-length breaks during the day may not.

Alertness and Performance

- Significant time of day effects were demonstrated with both performance and alertness minima at approximately 0215 hours, with a small dip at 1330 hours ["post lunch dip"]. The maxima for both variables were at 1830 hours.

- Performance and alertness both followed a bimodal time of day rhythm. The results demonstrate that the time of day, ie. the circadian rhythm, explains most of the variance in performance and alertness levels (91% and 84%, respectively).

Length of Pre-work Hours

- After controlling for time of day, the length of pre-work hours had no significant effect on neuro-behavioural performance or self-assessed alertness.

Shift Duration

- This study indicates that shift duration had no effect on performance or alertness. There has been much conjecture in the previous literature as to whether shift duration effects performance and alertness. The NSWS identifies previous findings that have been presented to support both reduced and unaffected performance or alertness levels as shift duration increases.

- The conclusions adopted by the NSWS identifies the time of day, circadian rhythms and the lack of biological adaptation to irregular shiftwork as the main contributors to the accumulation of fatigue.

Biological Adaptation

- The primary finding demonstrated that subjects did not 'shift' their biological clock in response to the irregular hours they worked. A distinct circadian element was found with

sleep propensity, subjects ‘chose’ to sleep in the optimal position for sleep in their circadian phase (at night) whenever possible.