

Assessing Fatigue Risk - BC Forest Industry

The purpose of this material is to assist BC Forestry industry participants to identify, assess and manage the risks associated with sleep-related fatigue. The Fatigue Risk Matrix is a risk-based assessment 'quick look-up' tool that provides the user with a quick assessment of fatigue risk. Best practices recommend that the tool be used as part of a comprehensive Fatigue Risk management system. A Fatigue Risk Management System (FRMS) is an overall risk management system that should include; a fatigue policy, identification of responsibilities, training and education, risk assessment and controls, and fatigue monitoring systems. An FRMS should be part of your wider Safety Management System (SMS). It recognizes the potential for fatigue-related errors and establishes controls to minimize the likelihood of incidents.

What is fatigue?

Fatigue is a state of tiredness or exhaustion that results in a degree of impairment. This impairment may be physical and/or mental and can result in an increased risk of workplace errors or accidents. All workplaces are affected by fatigue, but those employing shift work and/or non-standard (9:00 – 5:00) hours of operations are more likely to have a high fatigue risk.

Background

The forest industry recognizes that fatigue can be a contributing or immediate causal factor in incidents. By incorporating knowledge of fatigue management strategies, companies and individuals can implement appropriate measures to reduce the risk of fatigue-related incidents. Several research projects have been conducted in the BC Forest Industry, primarily focused on log hauling. The Fatigue Risk Matrix tool was created based on project findings and application of fatigue science as it relates to the forest industry.

Fatigue Risk Matrix

It is recognized that a *one-size-fits-all* approach may not work for everyone or under all circumstances. The fatigue risk matrix is designed to allow the flexibility to set work hours and duty durations based on unique operations and identify controls to reduce the risk of fatigue related incidents. It is the cumulative responsibility of both management and workers to address fatigue and the contributing factors as it applies to risk.

Factors considered in the matrix include:

- **Shift start time:** Early starts and night work will reduce the night sleep opportunity and result in a significant reduction in total sleep opportunity.
- **Duration of shift:** As the length of a given shift increases, the subsequent sleep opportunity decreases.
- **Sleep within the last 24 hours:** In general, performance begins to become impaired after less than 5 hours sleep over a 24 hour period
- **Sleep within the last 48 hours:** Performance also become impaired if sleep consistently falls below six hours per night on an ongoing basis (over the period of a week)

Sleep related fatigue factors not considered in the matrix that increases fatigue risk:

- Chronic sleep disruption (lack of sleep across longer than 48 hours)
- Acute and chronic sleep disruption (quality of sleep in the 24 and 48 hour periods)
- Sleep disorders



BC Forest Safety

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BC FOREST INDUSTRY - FATIGUE RISK MATRIX

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Management Risk Factors			
	FATIGUE RISK INCREASES		
Shift Start Time	7am to 7pm	7pm to 11pm 4am to 7am	11pm to 4am
Duration of Shift	≤ 8 hours	8 to 12 hours	>12
*Note The recommended time off between shifts is 10 hours when workers are sleeping away from home and 12 hours when sleeping at home. The extra time required when workers are at home allows for lifestyle activities.			
Worker Risk Factors			
Workers should determine their own risk of fatigue when preparing for duty and implement fatigue prevention strategies to reduce the risk factors.			
	FATIGUE RISK INCREASES		
Sleep within last 24 hours	>7 hours	>5 hours to 7 hours	≤ 5 hours
Sleep within last 48 hours	>12	10 hours to 12 hours	<10 hours
Key Considerations Related to Sleep:			
Will you have obtained less than 8 hours of sleep in the 24 hours before the time you chose?			
Will you have obtained less than 56 hours of sleep in the 7 days leading up to your chosen time?			
Will you be awake for more than 16 hours at your chosen time?			
If you answered yes to any of the above questions, you have an increased risk of being fatigued.			
Management Risk Factors	Recommended Controls		
High Risk	Reconsider shift start-time and/or duty duration.		
Worker Risk Factors	Recommended Controls		
High Risk	Consideration of fitness for duty. Incorporate a long break (defined as a period of two night sleeps with a non-working day in between). Long breaks typically provide a significant opportunity to recover from sleep loss accumulated over a sequence of work periods.		
	Recommended Controls		
	It should be noted that the control measures below are primarily counter measures. Fatigue prevention strategies should always be implemented before duty to reduce the risk of fatigue while on duty.		
Low Risk	No controls required		
Low to Moderate Risk	Fatigue training (attend fatigue awareness training or contact BC Forest Safety Council for options)		
Moderate Risk	Fatigue Training Nap / controlled rest (guidelines can be included in an FRMS) Counter measures - caffeine, physical activity, bright light Active monitoring (check in) during duty Home safe' check in		
High Risk	Fatigue Training Nap / controlled rest (guidelines can be included in an FRMS) Counter measures - caffeine, physical activity, bright light Active monitoring (check in) during duty Home safe' check in Should not perform more than 2 duties concurrently at high risk Should not perform more than 4 high risk duties in a 5 day period Document as an incident report with '2 up' sign off Consider implementation of fatigue intervention technology as part of the fatigue risk management program for occupations that require driving or commute times >45 minutes		
Additional Risks	Consider implementation of controls to address commuting (travelling from the worksite to home/camp) when the risk of fatigue is high or when commute times exceed 45 minutes. There is an increased risk of fatigue related incidents when commuting where duties have non-standard start times (9-5).		