

NIGHT FIT AT SEAWAY HEAVY LIFTING

Improving the
quality of sleep,
health and safety at
the Oleg Strashnov

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EXECUTIVE SUMMARY



The challenge

In the offshore industry, poor sleep and fatigue can act as a bottleneck in reaching optimal performance and safety. The noisy and stressful work environment combined with sleep cycle disruptions caused by shift work result in the fact that many offshore workers cope with sleeping difficulties. Excessively sleepy or fatigued workers are 70% more likely to be involved in accidents than well-rested and alert individuals.^[1] This is why managing poor sleep and fatigue should be a top priority in the offshore industry.



The current project at Seaway Heavy Liftings' HL vessel 'Oleg Strashnov'

In order to assess the risk of shift work fatigue and pro-actively strengthen its defences against it, Seaway Heavy Lifting decided to experiment with Night Fit onboard their HL vessel 'Oleg Strashnov' in July, 2016. In total, 66 shift workers were trained to make use of the Night Fit method during the offshore implementation phase of the project. This phase lasted 14 days.



A proactive solution: Night Fit

Night Fit uses blue lights and special glasses to synchronize light exposure with the shift work schedule leading to a quicker and more complete adaptation to the work schedule. This results in improved sleep quality and higher alertness levels. During the project two off-shore workshops were provided to the crew to raise awareness, create knowledge, and teach skills concerning sleep and the sleep enhancing strategies.



Summary: Results at the Oleg Strashnov

- 74% of the participants reported Night Fit has improved their sleep quality;
- The number of 'fairly bad' or 'very bad' sleepers decreased from 31% to 7%;
- Participants that reported to fall asleep within 30 minutes increased from 36% to 62%;
- 84% reported that they wanted to keep applying Night Fit

Sources:

1: (Swean, 2003): *Fatigue as a risk factor for being injured in an occupational accident: results from the Maastricht Cohort Study.*

EXECUTIVE SUMMARY



Benefits for Seaway Heavy Lifting

Improving sleep quality with Night Fit will provide Seaway Heavy Lifting with decreased workforce fatigue levels which will result in reduced human error risks and increased employee wellbeing. It will further improve safety levels and enables shift workers to be more productive, safe, and healthy.



Recommendations

To further optimize sleep patterns, health and safety at Seaway Heavy Lifting we recommend to embed the use of “Night Fit” in the company’s corporate HSE program.

THE CHALLENGE



Sleep in shift work environments

Worldwide, having sleeping problems is the 2nd most common known health complaint.^[2] The noisy and stressful work environment combined with sleep cycle disruptions caused by shift work result in the fact that sleeping problems are a common problem in the offshore industry. Numbers show that between 42% and 68% percent of Dutch shift workers experience difficulties sleeping.^[3]

In order to assess the sleep and fatigue situation before the Night Fit intervention took place, a Night Fit sleep and fatigue questionnaire was presented to the participating shift workers. Findings from this assessment show that 31% of the participants rated their sleep quality to be 'fairly bad or worse'. See Appendix B for a complete overview of this assessment. Feedback shows that the disturbances in noise combined with the lack of proper sound insulation at the cabins are the main cause of sleeping difficulties when working offshore.

Effects of fatigue on performance and safety

When investigating incidents and near misses when human error was a contributing factor, operator fatigue has often been found to have played a significant part.

Operator fatigue reduces safety in two ways:

- (1) it increases the potential for human error;
- (2) it reduces the capabilities to react to dangerous situations when they arise.

Sources:

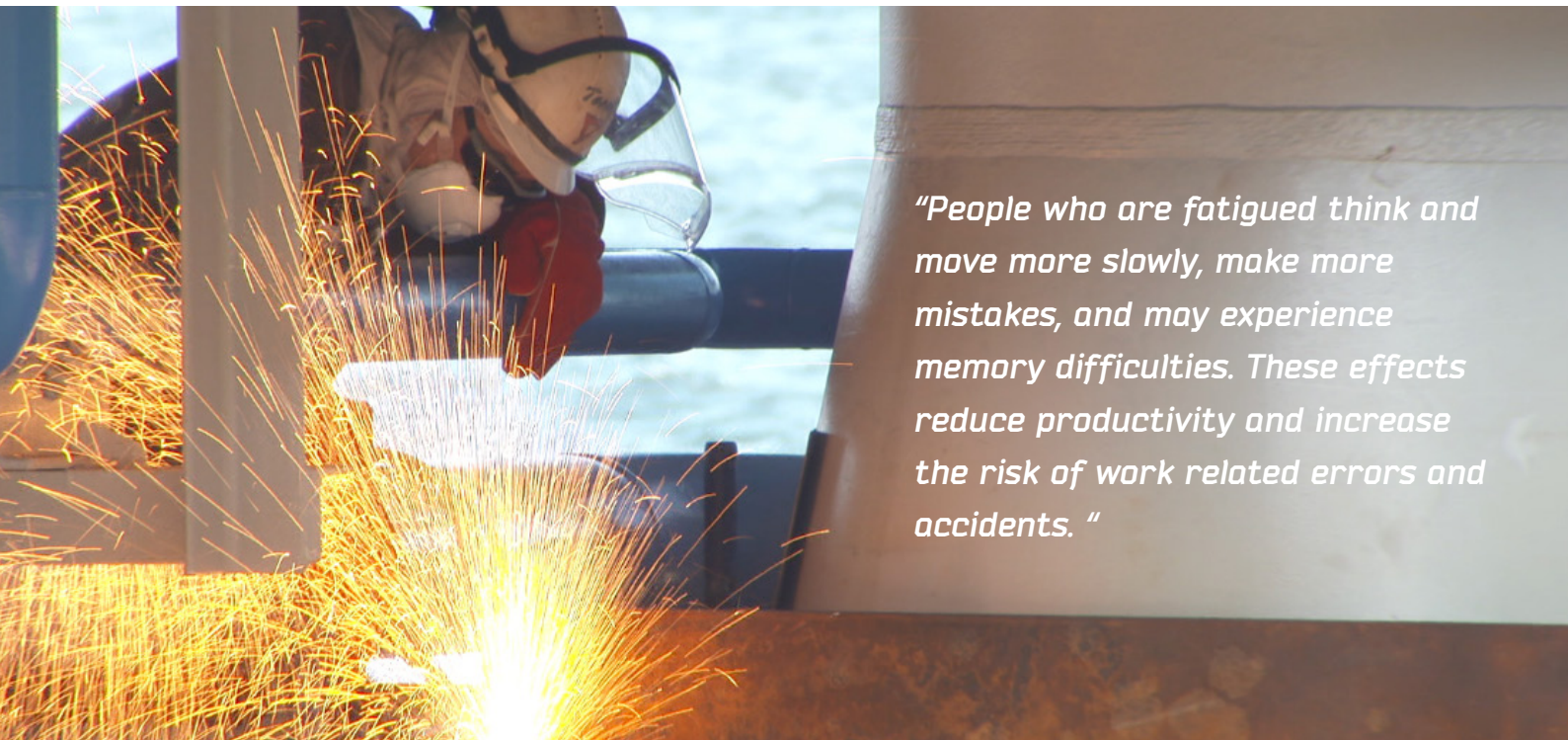
2: (GfK, 2015): https://www.gfk.com/fileadmin/user_upload/website_content/Global_Study/Documents/20151021_PR-study_Top-5-health-complaints_vfinal.pdf

3: (Arbored, 2015): http://newslettercollector.nl/newsletter/5605011f49795969358b457a_Hoe_goed_slapen_uw_mensen.html

Fatigue and human error

People who are fatigued think and move more slowly, make more mistakes, and may experience memory difficulties. These effects reduce productivity and increase the risk of work related errors and accidents. Excessively sleepy or fatigued workers are 70% more likely to be involved in accidents than well-rested and alert individuals.^[1] Being sleep deprived can reduce performance and safety in a similar way as alcohol affects people. Studies have shown that after 17-19 hours of being awake, individuals perform equal or worse, in comparison to individuals with an alcohol concentration of 0.05% in their blood (i.e. the drunk driving limit in Europe).^[4]

The perceived effects of shift work fatigue on performance and safety were assessed at the Oleg Strashnov using a questionnaire. 78% of the crew reported to experience lowered concentration when being fatigued, 67% stated it limits their ability to think clearly, and 45% reported to cope with memory problems when being in a state of fatigue.^[Appendix B] These are all safety critical aspects of human performance that stress the need to proactively fight shift work fatigue.



"People who are fatigued think and move more slowly, make more mistakes, and may experience memory difficulties. These effects reduce productivity and increase the risk of work related errors and accidents. "

Fatigue reduces the ability to correctly respond during crisis situations

In crisis situations quick and adequate decisions have to be made in order to prevent incidents or accidents from happening. In this study 45% of the participants reported to experience a decrease in situational awareness when being fatigued, 67% reported it results in slower performance, and 39% reported fatigue can lead to an underestimation of risks.^[Appendix B] These findings show that managing fatigue should be high on the agenda of Seaway Heavy Lifting.



Performance and safety benefits of enhancing sleep quality

Enhancing offshore sleep quality will immediately result in improved focus and concentration among the workforce and will reduce human error risks, helping them to make those split second decisions. Overall, by improving sleep patterns a safer work environment is created. ^[4]

Effects of poor sleep on health and wellbeing

Besides the abovementioned effects of sleep and fatigue on safety and performance, poor sleep also creates a serious health risk. Lack of sleep increases the risk of obesity, and is associated with lower life expectancy. It is no coincidence that health organizations from all over the world have declared it as a major health risk. Night Fit combats these risks by enhancing sleep quality without the use of medications. Improving the quality of sleep from poor to moderate or from moderate to good will result in stronger immune functioning, faster metabolism, more balanced hormones, increased energy and a greater level of focus ^[4,5].

Sources:

1: (Swean, 2003): *Fatigue as a risk factor for being injured in an occupational accident: results from the Maastricht Cohort Study.*

4: (Williamson, et al, (2000) Williamson, A.M., Feyer, A.M. (2000). *Moderate sleep deprivation produces impairments in cognitive and motor performance equivalent to legally prescribed levels of alcohol intoxication.*

5: Beccuti, Guglielmo, and Silvana Pannain. "Sleep and obesity." *Current opinion in clinical nutrition and metabolic care* 14.4 (2011): 402.

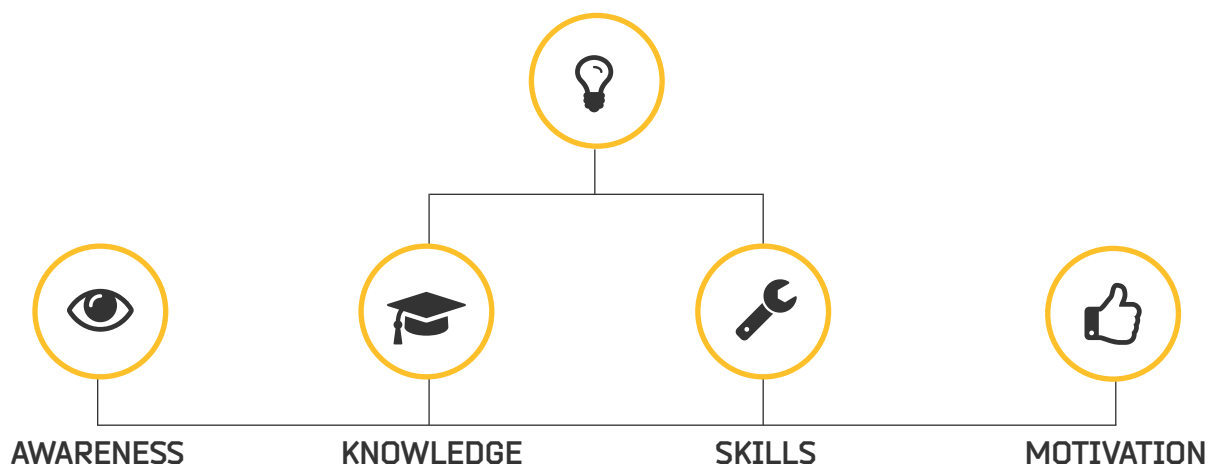
NIGHT FIT, A PROACTIVE FATIGUE COUNTERMEASURES SOLUTION

The Night Fit method aims to improve the quality of sleep in shift work environments. This is achieved by introducing tools such as special glasses and blue lights which target the sleep center of our brain. A similar form of light treatment has successfully been applied by NASA in order to enhance shift work performance, health and safety.^[6] KM Human Factors Engineering has used this knowledge in order to create the Night Fit method; a comprehensive offshore solution.

Proper usage of the provided tools are essential to maximize the beneficial effects of this intervention. This is why Night Fit provides a complete package that includes two offshore workshops in addition to personal guidance and training, enabling personnel specific problems to be tackled in the most efficient manner.



NIGHT FIT TOOLS



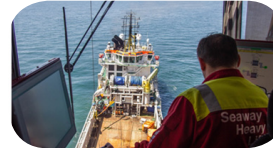
Offshore workshops are provided to raise awareness, create knowledge, teach skills concerning sleep and sleep enhancing strategies. It is essential to create the right motivational mindset for the crew. This allows them to keep using the Night Fit strategies correctly in the longer term. On the next page the different topics of these workshops are listed.

Sources:

6: Stewart, K. T., Hayes, B. C., & Eastman, C. I. (1995). Light treatment for NASA shiftworkers. *Chronobiology International*, 12(2), 141-151



‘Work hard, sleep hard’ workshop



The following topics were discussed during the first workshop:

- Why sleep is important for performance and safety
- Why sleep is important for health
- Awareness about your own sleep situation
- Basics of circadian rhythms
- How to reduce fatigue with light treatment, learn from NASA & Military
- Instructions: Bright lights, glasses & questionnaires

Workshop II: Work Hard, Sleep Harder



Night Fit Workshop II Work Hard, Sleep Harder



The following topics were discussed during the second workshop:

- Overview current sleep and fatigue situation at the Oleg Strashnov
- Effects of stress on sleep and performance
- How to reduce stress: instructions Mp3 relaxation exercises
- Bad sleep habits, how to overcome them
- The use of light treatment to cope with night shifts and jet lags
- Extra sleep advice bad sleepers

Light treatment: How it works

Many shift workers encounter problems when adjusting their sleeping schedules for night work; the mismatch between their internal biological clocks and their required working times leads to a jet lag similar to traveling across time zones.

Standard artificial lighting, as can be found on many offshore locations, lack the intensity and colour to align the biological clock to the new schedule completely. In offshore shift work environments this results in the fact that for many shift workers the duration and quality of sleep is significantly lower during night shifts when compared to day shifts. On the Oleg Strashnov the same effects were found: See

Appendix B for an overview.

The problem is that the light and dark cues needed for a complete adjustment to the night work schedule are missing. For example, a night shift worker will not see bright daylight when waking up, and his body will attempt to adjust to the day/night schedule instead of his work schedule. Because of this, many shift workers are unable to properly adapt, meaning that they will experience suboptimal sleeping patterns.

Night Fit uses blue lights and special glasses to synchronize the light cues with the shift work schedule leading to a quicker and more complete adaptation to the work schedule. This results in improved sleep quality and higher alertness levels.

“Coming from an environment which is abundant in natural light, I find the adjustment to working condition combined with long distance travel difficult...”

“...Having a natural light source would be very helpful in overcoming this and help with getting my body back into rhythm.”

- Luke Allan
IHC Engineer



By presenting workers methods to use special glasses and blue light correctly, and by helping them to find the right motivational mindset, they will start recognizing the optimal moments to apply the method themselves. The work schedule and in some cases the specific characteristics of the user are all taken into account whilst applying the Night Fit method. As a result, the quality of sleep can be enhanced, even though no medication is used throughout the process.

Reducing workforce stress levels

As part of the above-mentioned, the Night Fit method aims to reduce stress levels of the shift work crew. During the two offshore workshops, relaxation and meditation exercises were offered to the crew. In total, 18 shift workers applied for these exercises.

“For me the blue light made me feel more awake and alert. Especially in the dark hours from 02:00 h to 05:00 h at night.”

– Rutger. K, - Second Officer

“Normally I can hardly fall asleep the first three to four hours after the shift. Now my sleep has improved and I feel more energized.”

– Romy. S, - Safety Officer

NIGHT FIT BENEFITS

IMPROVED PRODUCTIVITY



Night Fit helps to improve the quality of sleep in shift work environments. By reducing fatigue levels, alertness, vigilance and cognitive capacity are increased by Night Fit. As a result the overall productivity of the offshore workforce will increase.

IMPROVED HEALTH



By increasing the quality of sleep offshore, shift workers will have a more healthy appetite, better hormone function, improved immune function, and a higher energy level. It will increase overall physical and mental wellbeing and enables shift workers to operate at their maximum potential.

IMPROVED SAFETY



Improving the quality of sleep will result in an immediate increase in focus and vigilance. As a result, human error risks will be reduced. All things considered, by improving sleep duration and quality using the Night Fit method, a safer work environment will be created.



"Last week I experienced deeper sleep and did not wake up so much as usually. Normally I get very little sleep and wake up quite often."

– Sean. D, - Scaffolder

"It works for me, since using it I sleep better and feel less tired, it's comfortable for me to use. The last years before Night Fit it was very hard for me to get good sleep."

– Roseli. L, – Mechanic



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