



## TSB BACKGROUNDER

# New and previous TSB recommendations addressing the risk of fatigue in the marine sector

### TSB recommendations intended for watchkeepers

On 13 October 2016, shortly after 0100 Pacific Daylight Time, the articulated tug-barge composed of the tug *Nathan E. Stewart* and the tank barge *DBL 55* went aground on Edge Reef near Athlone Island, approximately 10 nautical miles west of Bella Bella, British Columbia, in Heiltsuk First Nation's traditional territory. The tug's hull was eventually breached and approximately 110 000 litres of diesel fuel were released into the environment. The investigation (M16P0378) found that the watchkeeper on duty, who was fatigued and alone on the bridge when the vessel ran aground, had unintentionally fallen asleep and missed a planned course change.

Although fatigue is widely accepted as an unavoidable condition within the marine industry and is recognized as a contributing factor in many marine accidents,<sup>1</sup> there is a general lack of awareness of the factors that cause fatigue. If watchkeepers have an understanding of those factors and of the practical actions that can be taken to minimize their effects, there may be a significant reduction in the number of fatigue-related occurrences. The Board therefore recommends that

the Department of Transport require that watchkeepers whose work and rest periods are regulated by the *Marine Personnel Regulations*<sup>[2]</sup> receive practical fatigue education and awareness training in order to help identify and prevent the risks of fatigue.

**TSB Recommendation M18-01**

Education and awareness training is only the first step. To effectively manage the risks associated with fatigue, vessel owners also need a proactive, multifaceted approach that is tailored to their specific operations. The Board therefore recommends that

the Department of Transport require vessel owners whose watchkeepers work and rest periods are regulated by the *Marine Personnel Regulations* to implement a comprehensive fatigue management plan tailored specifically for their operation, to reduce the risk of fatigue.

**TSB Recommendation M18-02**

---

<sup>1</sup> The World Maritime University, *Fatigue at Sea: A Review of Research and Related Literature* (Malmö, Sweden: VTI, the Swedish National Road and Transport Research Institute, April 2006), at <http://www.transportportal.se/ShipDocs/2013-11-15rec162016.pdf> (last accessed 17 April 2018).

<sup>2</sup> Transport Canada's *Marine Personnel Regulations* (MPR) provide the regulatory means by which risks of fatigue are addressed in the Canadian marine industry, and incorporate the *Seafarers' Training, Certification and Watchkeeping Code*.

Under the *Canadian Transportation Accident Investigation and Safety Board Act*, the Minister of Transport must formally respond to TSB recommendations within 90 days and explain how Transport Canada has addressed or will address the safety deficiencies.

## **TSB recommendations targeting pilotage services**

In December 1993, while attempting to berth at a slip in Hamilton Harbour, Ontario, the bulk carrier *Nirja* struck another tanker which was moored alongside. The TSB investigation (M93C0003) found that the pilot had been on duty for some 22 hours without restorative sleep and this probably adversely affected his performance.

The Board had two specific concerns arising out of this occurrence. First, pilotage assignment practices at the time permitted extended duty days which could lead to significant performance degradation. Secondly, both the Great Lakes Pilotage Authority and the pilots themselves apparently did not fully appreciate the negative effects of fatigue on performance and the strategies for mitigating those effects. Therefore, the Board recommended that

the Department of Transport and the Great Lakes Pilotage Authority implement a policy and procedures for allocating pilotage assignments, such that pilots receive sufficient rest to minimize the adverse effects of fatigue on performance.

**TSB Recommendation M96-17**

The Board also recognized that strict enforcement of mandatory rest periods would not in itself ensure that pilots would be protected from the adverse effects of fatigue. Many factors beyond scheduling can affect performance while on duty. Pilots must also develop personal strategies for coping with the natural physiological effects of shift work, irregular work schedules, or extended duty hours. To assist them in coping with the natural stresses of operating in a "24/7" industry, the Board recommended that

the Great Lakes Pilotage Authority develop and implement an awareness program to provide guidance to dispatching staff and pilots on reducing the adverse effects of fatigue on job performance.

**TSB Recommendation M96-18**

In September 1997, while transiting Johnstone Strait, British Columbia, the bulk carrier *Raven Arrow* (M97W0197) grounded when the pilot, who had the conduct of the vessel, ordered an alteration of course to enter Blackney Passage.

The Board determined that the *Raven Arrow* grounded in fog when the pilot lost situational awareness and prematurely altered course. Among other contributing factors was the fact that the pilot did not fully appreciate the negative effects that irregular work schedule and sleep debt can have on performance. The pilot was probably fatigued and there was no formalized education/training program in place regarding conditions conducive to fatigue and the impact of scheduling on fatigue. Therefore, the Board made the following two recommendations to the effect that

the Canadian pilotage authorities adopt pilotage assignment policies and practices that both reflect the workload associated with the seasonal fluctuation in demand for pilotage services and help ensure pilots are well rested between assignments, so as to minimize the adverse effects of short-term and/or chronic fatigue on their performance.

**TSB Recommendation M99-03**

the Department of Transport and the Canadian pilotage authorities develop and implement an awareness program to provide guidance to operational employees, including pilots, on reducing the adverse effects of fatigue on job performance.

**TSB Recommendation M99-04**

In 2003, in response to these recommendations, Transport Canada finalized a fatigue management and awareness training program for marine pilots, which was integrated within the broader training programs for apprentice pilots in Canada.

Based on this and other actions taken, the Board assessed all four prior recommendations regarding pilotage services as **Fully Satisfactory**.