Rhodes & Associates Inc.
Human Factors Consultants

177 Jenny Wrenway, Toronto, Ont. M2H 2Z3
Phone: 416-494-2816 Fax: 416-494-0303
Email: wayne-rhodes@rogers.com

TP 14127E

Fatigue Management Training for Canadian Marine Pilots

Prepared for
Marine Safety Directorate
and
Transportation Development Centre
of
Transport Canada

By

Rhodes & Associates Inc.

July 2003

Fatigue Management Training for Canadian Marine Pilots

Prepared by

Wayne Rhodes, Ph.D., C.P.E.

Vince Delle Donne, M.Eng., P.Eng.

July 2003

This report reflects the views of the authors and not necessarily those of the Transportation Development Centre or the Marine Safety Directorate of Transport Canada.

Un sommaire français se trouve avant le table des matières.

Transport Canada / Transports Canada

PUBLICATION DATA FORM

1. Transport Canada Publication No.	2. Project No.	3. Recipient's Catalogue No.
TP 14127E	5394	

4. Title and Subtitle	5. Publication Date
Fatigue Management Training for Canadian Marine Pilots	July 2003
	6. Performing Organization Document No.

7. Author(s)	8. Transport Canada File No.
Wayne Rhodes and Vince Delle Donne	2450-IP01

9. Performing Organization Name and Address	10. PWGSC File No.
Rhodes & Associates Inc. 177 Jenny Wrenway Toronto, Ontario Canada M2H 2Z3	HAL-2-40956
	11. PWGSC or Transport Canada Contract No. T8200-022560/001/HAL

12. Sponsoring Agency Name and Address	13. Type of Publication and Period Covered
Transportation Development Centre (TDC) 800 René Lévesque Blvd. West Suite 600 Montreal, Quebec H3B 1X9	Final
	14. Project Officer I. Marcil

15. Supplementary Notes (Funding programs, titles of related publications, etc.)

Co-sponsored by the Marine Safety Directorate of Transport Canada

16. Abstract

As part of a multiphase project that developed a full-scale fatigue management program for Canadian marine pilots, the present work involved an initial trial and evaluation of two fatigue management training modules:

- Train-the-trainer fatigue management workshop (TTT workshop); and
- Marine pilot fatigue management workshop (MPW).

One TTT workshop and three MPWs were conducted. The TTT workshop involved two full days of instruction and practice. The MPWs were one-day sessions, held in Cornwall, Montreal and Quebec City, that involved six hours of instruction and participation, with additional time for two breaks and lunch. Pilots and management from the Great Lakes pilotage authority and the Laurentian pilotage authority attended the MPW sessions.

The sessions were all well received and successful according to the immediate feedback obtained through questionnaires and observation. The trainer who took the TTT workshop gave an excellent rating on all questions on the TTT questionnaire and performed very well during the two MPW sessions he led. The participants responded very favourably on the MPW questionnaire and showed a keen interest in fatigue management. They asked highly relevant questions and engaged in discussions about such subjects as the feasibility of strategies, the impact of irregular hours on their health and job conditions, and the need for change to the present pilotage system.

It is recommended that the training modules be adopted by other pilotages, and that all personnel in each pilotage receive the training. The training modules will require some modification for appropriate application to each pilotage.

17. Key Words	18. Distribution Statement
Fatigue management training, marine pilots, FMP workshop	Limited number of copies available from the Transportation Development Centre

19. Security Classification (of this publication)	20. Security Classification (of this page)	21. Declassification (date)	22. No. of Pages	23. Price
Unclassified	Unclassified	—	x, 30, apps	Shipping/ Handling

Transports Canada Transport Canada

FORMULE DE DONNÉES POUR PUBLICATION

1. N° de la publication de Transports Canada	2. N° de l'étude	3. N° de catalogue du destinataire
TP 14127E	5394	

4. Titre et sous-titre	5. Date de la publication
Fatigue Management Training for Canadian Marine Pilots	Juillet 2003
	6. N° de document de l'organisme exécutant

7. Auteur(s)	8. N° de dossier - Transports Canada
Wayne Rhodes et Vince Delle Donne	2450-IP01

9. Nom et adresse de l'organisme exécutant	10. N° de dossier - TPSGC
Rhodes & Associates Inc. 177 Jenny Wrenway Toronto, Ontario Canada M2H 2Z3	HAL-2-40956
	11. N° de contrat - TPSGC ou Transports Canada
	T8200-022560/001/HAL

12. Nom et adresse de l'organisme parrain	13. Genre de publication et période visée
Centre de développement des transports (CDT) 800, boul. René-Lévesque Ouest Bureau 600 Montréal (Québec) H3B 1X9	Final
	14. Agent de projet
	I. Marcil

15. Remarques additionnelles (programmes de financement, titres de publications connexes, etc.)

Projet coparrainé par la Direction générale de la sécurité maritime de Transports Canada

16. Résumé

Les présents travaux font partie d'un projet en plusieurs phases visant la mise au point d'un programme complet de gestion de la fatigue destiné aux pilotes maritimes canadiens. Ils ont consisté en un premier essai, suivi d'une évaluation, des deux modules de formation suivants :

- atelier de formation des formateurs en gestion de la fatigue (FF);
- atelier sur la gestion de la fatigue pour les pilotes maritimes (GFP).

Un atelier de formation des formateurs et trois ateliers de GFP ont été donnés. L'atelier de formation des formateurs comprenait deux jours complets de cours théoriques et pratiques. Les ateliers de GFP, d'une durée d'une journée, se sont déroulés à Cornwall, Montréal et Québec. Il comprenaient six heures d'exposés théoriques et d'exercices, sans compter le temps accordé pour les deux pauses et le dîner. Des pilotes et des membres de la direction de l'Administration de pilotage des Grands Lacs et de l'Administration de pilotage des Laurentides ont assisté aux ateliers de GFP.

Si l'on se fie aux réponses des participants aux questionnaires distribués à la fin de l'atelier et aux observations des responsables, les ateliers ont été bien accueillis et ont remporté un grand succès. Le formateur qui a assisté à l'atelier FF a attribué une excellente cote à toutes les questions du questionnaire de l'atelier FF et s'est très bien tiré d'affaires au cours des deux ateliers de GFP qu'il a dirigés. Les participants ont répondu très favorablement au questionnaire de l'atelier de GFP et ont démontré un vif intérêt à l'égard de la gestion de la fatigue. Ils ont posé des questions très pertinentes et ont discuté de sujets variés, notamment la nécessité de modifier le système de pilotage actuel, la faisabilité des stratégies de gestion de la fatigue et l'effet des horaires irréguliers sur leur santé et sur leurs conditions d'emploi.

On recommande donc que les modules de formation soient adoptés par les autres administrations de pilotage et que chacune assure la formation de tout son personnel. Les modules de formation devront être légèrement modifiés pour répondre aux besoins précis de chaque administration.

17. Mots clés	18. Diffusion
Formation sur la gestion de la fatigue, pilotes maritimes, atelier du PGF	Le Centre de développement des transports dispose d'un nombre limité d'exemplaires.

19. Classification de sécurité (de cette publication)	20. Classification de sécurité (de cette page)	21. Déclassification (date)	22. Nombre de pages	23. Prix
Non classifiée	Non classifiée	—	x, 30, ann.	Port et manutention

Executive Summary

A fatigue management program (FMP) prototype was developed for Canadian marine pilots on behalf of the Transportation Development Centre of Transport Canada. This project involved two initial phases that resulted in a report on fatigue and guidelines for a fatigue management program prototype; a fatigue management (FM) handbook for trainers; and an FM guide for marine pilots. This third phase of the project involved the initial training and evaluation of the training workshops.

Method

One two-day train-the-trainer (TTT) workshop was conducted by an experienced instructor for one trainer who would be conducting two of three one-day marine pilot workshops (MPWs). The TTT trainee was fully prepared for the TTT workshop, having read all the materials provided and reading other related materials prior to the workshop. The instructor for the TTT workshop conducted the first MPW so that the trainer could experience the session as an observer before conducting his own sessions. This instructor was also present for the two MPWs conducted by the trainer. Evaluation questionnaires and notes taken during the MPW sessions provided useful assessment information on the trainer's performance, quality of the workshop conduct, quality of the participation by attendees, and usefulness and acceptance of the workshops. Detailed criteria are described in the body of the report.

Results

The TTT workshop progressed smoothly and provided the trainer with a sound basis for conducting his own workshops. The TTT workshop was complete, met all criteria, and received high ratings from the trainer. The trainer achieved and exceeded the basic evaluation criteria for conduct of the workshops. He demonstrated that he knew the material, had confidence discussing the topics with the participants, and could keep to the scheduled time.

The MPWs were also successful. Slightly higher evaluation ratings were achieved for the two groups that did not have prior involvement in the first two phases of the initiative, although all ratings were very favourable. The sessions went very smoothly, with exceptional response from the participants, who asked many questions, engaged in highly relevant discussion, and shared their own experiences openly. All of the participants indicated that they would recommend the workshop to colleagues and many suggested that the workshop be offered to all commercial mariners operating in Canadian waters.

Conclusion

The educational component of the prototype FMP for marine pilots is viable and highly likely to be successful for all pilotage groups, with slight modifications to respond to the individual needs of each pilotage.

Sommaire

Un prototype de programme de gestion de la fatigue (PGF) à l'intention des pilotes maritimes canadiens a été élaboré pour le compte du Centre de développement des transports, de Transports Canada. Les deux premières phases du projet ont débouché sur un rapport sur la fatigue des pilotes maritimes et sur des lignes directrices relatives à un prototype de programme de gestion de la fatigue; d'un manuel du formateur sur la gestion de la fatigue et d'un guide de gestion de la fatigue pour les pilotes. La troisième phase du projet comportait la tenue des premiers ateliers de formation en vue de leur évaluation.

Méthodologie

Un instructeur chevronné a donné un atelier de formation des formateurs (FF) d'une durée de deux jours à un formateur qui devait par la suite diriger deux ateliers sur trois, d'un jour, sur la gestion de la fatigue pour les pilotes maritimes (GFP) prévus pour ces derniers. Le stagiaire de l'atelier FF était fin prêt pour cet atelier, ayant lu au préalable toute la documentation fournie, ainsi que d'autres documents connexes. L'instructeur de l'atelier FF a donné une première fois l'atelier de GFP, de façon à ce que le formateur ait la chance de l'observer avant d'animer l'atelier à son tour. L'instructeur a également assisté aux deux ateliers de GFP donnés par le formateur. Les questionnaires d'évaluation et les notes prises pendant le cours ont été d'une aide précieuse au moment d'évaluer le rendement du formateur, la qualité de son atelier, la qualité des interventions des participants ainsi que l'utilité et l'acceptation des ateliers. Le présent rapport comprend les critères détaillés de cette analyse.

Résultats

L'atelier de formation des formateurs s'est déroulé sans anicroche et a permis au formateur d'acquérir des bases solides pour la conduite de ses propres ateliers. Cet atelier était complet en soi, a répondu à toutes les exigences et a été très bien coté par le formateur. Ce dernier a atteint, et même surpassé, les critères d'évaluation de base pour la conduite des ateliers. Il a démontré qu'il maîtrisait bien sa matière, qu'il était confiant lorsqu'il discutait des divers sujets avec les participants et qu'il était capable de respecter les temps de référence.

Les ateliers de GFP ont également été un franc succès. Les deux groupes qui n'avaient pas participé aux deux premières phases du projet ont accordé des notes légèrement plus élevées que les autres groupes, mais les évaluations étaient très positives dans l'ensemble. Les ateliers se sont déroulés sans heurt, les groupes réagissant très bien : les participants posaient de nombreuses questions, s'engageaient dans des discussions très pertinentes et partageaient leurs expériences ouvertement. Tous les participants ont indiqué qu'ils recommanderaient l'atelier à des collègues, et bon nombre d'entre eux ont suggéré d'offrir l'atelier à tous les gens de mer naviguant en eaux canadiennes.

Conclusion

Le volet formation du prototype de PGF pour les pilotes maritimes est viable et sera vraisemblablement très utile à toutes les administrations de pilotage, moyennant de légères modifications pour qu'il puisse répondre aux besoins particuliers de chaque administration.

Contents

List of Figures

List of Tables

1. Introduction

This report provides the results of a test of the educational components of a fatigue management program (FMP) developed for Canadian marine pilots. Initial training workshops were conducted using the guidelines and materials produced by an earlier project involving the development of an FMP prototype applicable for adaptation to Canada's marine pilotages. The test of the educational components constitutes Phase 3 of an overall FMP initiative sponsored by the Transportation Development Centre of Transport Canada.

The overall Fatigue Management Program for Marine Pilots prototype development included the following phases:

- Phase 1 – Study of Fatigue Issues in Canadian Marine Pilotage;
- Phase 2 – Development of a Fatigue Management Program for Marine Canadian Pilots; and
- Phase 3 – Initial Fatigue Management Training and Evaluation of the Workshops.

Phases 1 and 2 produced the following documents:

1. Development of a Fatigue Management Program for Canadian Marine Pilots – TP 13958E
2. Fatigue Management Guide for Canadian Marine Pilots – TP 13959E
3. Fatigue Management Guide for Canadian Marine Pilots: A Trainer's Handbook – TP 13960E

The first two phases laid the groundwork for the structure of an FMP prototype that would be appropriate for application to a marine pilotage work environment. The resulting prototype consisted of several components, one of which was a training module for pilots and management. The goal of Phase 3 was to conduct and evaluate a two-day train-the-trainer session and one-day fatigue management workshops.

This document reports on the fatigue management workshops conducted for marine pilots in Cornwall, Quebec City, and Montreal. The workshops not only provided useful information for the participants, but also allowed the Transportation Development Centre to evaluate the short-term effectiveness, acceptance, and feasibility of the workshops (see section 1.4 for details on the assessment criteria).

1.2. Purpose

The purpose of this Phase 3 research was to conduct a two-day train-the-trainer session and fatigue management workshops to test the training modules and evaluate them according to the criteria in section 1.4.

1.3. Scope

This project involved only the Great Lakes Pilotage Authority (GLPA) and the Laurentian Pilotage Authority (LPA) for the initial training workshops and assessment. Assessment tools were developed and used to evaluate the training. This included a questionnaire in French and English for the participants to complete (see Appendix A) and observational notes (see Appendix B).

1.4 Evaluation Criteria

1.4.1 Observations

An observer (assessor) was present at each pilot workshop session. The assessor noted the performance of the workshop facilitator (trainer) and the response of the participants according to the criteria described below. The former observations allowed the assessor to evaluate the trainer, while the latter observations provided information on the quality of the workshop itself.

Participation

The assessor observed the immediate impact of the workshop on participants. The workshop was considered a success from a participation point of view if:

- Relevant questions were being asked;
- Information was shared about experiences and the success or failure of countermeasures; and
- Participants were attempting to answer questions posed by the trainer.

Discussions

Often the depth and relevance of the discussions can be a good indicator of how much participants are getting out of the workshop. The assessor focused on the following questions:

- Were the discussions highly relevant?
- Did the discussions add value to the workshop by providing others with work-related information associated with the workshop subjects?
- Did the discussions indicate that the participants were interested in resolving the issues?

Feasibility

The assessor watched for hasty delivery, skipping important information and any interruption of discussions etc. to determine whether the duration of the workshop was adequate. The assessor also determined whether:

- The number of participants was effective for the workshop setting;
- The venue was adequate in size;
- The necessary equipment and tools were available;
- Food and beverages were adequate in quality and supply (important to keep all participants nearby and ready to continue in the workshop); and
- Any problems arose that may have caused the workshop to falter or lose effectiveness, such as lighting requirements, noise levels, glare, poor ventilation, interruptions, etc.

1.4.2 Questionnaires

The post-workshop questionnaire provided the opportunity for participants to voice their opinions of the workshop. Areas covered were as follows:

PRESENTATION

- Clarity and comprehension in the delivery of the workshop;
- Dynamic quality of the presentation;
- Ability of the trainer to draw participants into discussion and participation;
- Ability of the trainer to answer questions; and
- Acceptability of the duration of the workshop.

WORKSHOP MATERIAL

- Adequacy of the material;
- Helpfulness of the material;
- Effectiveness of the material to increase knowledge;
- Effectiveness of material in its potential for application to the workplace;
- Completeness of the material;
- Overall worth of the workshop; and
- Recommendation of the workshop to others.

1.4.3 Future Evaluation

Longer-term evaluation of effectiveness, using interviews, questionnaires, and/or focus groups, should be considered. These evaluations should occur about a year from now and be repeated as needed. Such longer-term evaluations could be done by outside experts or could be conducted by the FMP co-ordinator, if one is appointed and properly trained.

A formal examination was not part of the workshop, simply because this level of testing would have added significant time to the session and would not fit within the limited time allotted. Once the FMP training can be formally integrated into the marine pilot training syllabus, an examination should be considered. In fact, a selection of excellent questions already exists in the FMP developed by the Centre for Sleep Research (now the Centre for Applied Behavioural Sciences) at the University of South Australia, a workbook entitled *Practical Living for Shiftworkers* (Baker, et al., 2001). These questions could be adapted to the pilot work environment and usual examination format.

1.5. Approach

The project proceeded as follows:

A. Planning for the project.

B. Conduct of the two-day train-the-trainer session in Toronto.

C. Conduct of a one-day workshop in Cornwall, including assessment.

D. Conduct of a one-day workshop in Quebec City, including assessment.

E. Conduct of a one-day workshop in Montreal, including assessment.

F. Distribution of certificates, reference material, and additional slides to all particpants.

G. Preparation of the Phase 3 report.

2. Results of the Train-the-Trainer (TTT) Workshop

2.1 Logistical Feasibility of the TTT Session

The TTT session proceeded as expected without problems. The session was held in a business class hotel that proved to be an excellent venue. The cost effectiveness was excellent and all necessary equipment and materials were supplied by the hotel, including an LCD projector, flip chart, white board and markers, and adequate work surface area. The room was of adequate size, had adjustable lighting and good ventilation, and was located away from traffic and noise.

2.1.1 TTT Duration

The session was conducted over two days from March 10 to 11, 2003, from 09:00 to 17:00 (with an hour break at lunch). This was an adequate amount of time for all materials to be covered, including presentation, discussion and questions, and for the trainer to practise by doing a dry run, presenting the workshop while being coached by the instructor at strategic points (i.e. every 30 minutes and between each portion of the slide presentation).

2.1.2 TTT Material

The level and amount of presentation material met the requirements for adequate coverage within the short 14-hour timeframe, with additional reference to the training manual and pilots' guide. The use of the LCD projector was an excellent means to convey the PowerPoint presentation and allowed the lighting to be adequate for review of written materials and note taking.

2.1.3 TTT Venue

The use of a hotel meeting room proved to be perfect for the session and is recommended for future TTT workshops. This allowed the session to proceed without interruption, leverage the facility's equipment and services, and simulate the actual environment where the fatigue management workshops will be conducted. The hotel was close to the instructor's office and easy to access by the trainer, who arrived by cab from the airport, located just minutes away.

2.2 Trainer's Experience in the TTT Session

The trainer's questions regarding material facilitated useful discussion. These questions were based on the materials provided prior to the session in the form of the trainer's

handbook and pilots' guide. Hence, the trainer was aware of fatigue management concepts and the background required to understand the material at the level of depth necessary.

The TTT instructor provoked questions to test the trainer's understanding of the material throughout the first day of the session. The trainer responded to these questions and discussions about the importance and application of the concepts ensued. This drew the trainer into useful exploration of the origin of the information in the pilots' guide and a deeper understanding of its scientific and experiential basis.

The second day provided an opportunity for the trainer to present the material and benefit from the TTT instructor's experience. The trainer presented material without interruption for about 30 minutes, after which the instructor provided relevant feedback. This involved considerable discussion and reinforcement of the concepts. The trainer took advantage of these discussions to verify the intent and content of the presentation material. The instructor provided advice about the delivery and rationale, and described situations to expect, how to respond and what response to expect. The instructor warned the trainer about certain topics that are sensitive. A major point made during the TTT workshop was that any topics raised during the MPWs that require medical expertise should be referred to a medical practitioner and that the trainer should refer MPW participants to authoritative documentation on topics he/she is unqualified to handle. Hence, the trainer was made aware of the fact that he must not be hesitant about referring participants to their doctor or to reference material that would allow them to learn more on the topic.

2.3 Trainer's Rating of the TTT

2.3.1 Presentation

The trainer was satisfied with the TTT session and was concerned only with the translation of the slides and notes into French. The trainer answered "strongly agree" to all of the questions contained in the "Presentation" section of the Train-the-Trainer Workshop Questionnaire that can be found in Appendix A.

2.3.2 Material

The trainer answered "strongly agree" to all of the questions in the "Materials" section of the TTT evaluation questionnaire in Appendix A.

3. Results of the Marine Pilot Workshops (MPWs)

One-day marine pilot fatigue management workshops for were conducted in the following locations:

- Cornwall
- Quebec City
- Montreal

Both management and marine pilots attended these workshops. The proportion of management in the Cornwall session was significantly higher than that for the other two locations. The GLPA was also involved in Phases 1 and 2 of the FMP development. Useful discussions about the application of strategies and the requirements for supporting these strategies occurred at all of the sessions. Hence, dialogue from all parties occurred. This enhanced the value of the workshops considerably, by allowing the discussion of pertinent topics related to fatigue management and the implementation of various strategies. Discussions included such subjects as the need for facilities, the manner in which certain scheduling practices negatively affect sleep, the inadequacy of many taxi services, and the inability to rest when navigating certain parts of the St. Lawrence-Great Lakes system.

3.1 Logistical Feasibility of MPW

3.1.1 MPW Duration

The one-day workshop is designed to allow both presentation of materials and considerable discussion and question answering to occur. Each session started at 09:00 and ended by 17:00. The participants had lunch on site to reduce the length of time needed for the break and to provide an opportunity for discussion of the workshop information over the meal.

3.1.2 MPW Material

The slides presented were more comprehensive than the information included in the pilots' guide, providing greater depth of coverage. Pilots who had read the guide were prepared to ask relevant questions. Their eagerness to ask questions and discuss various topics likely came from the fact that the guide is highly consistent with the presentation and their preparedness helped them formulate excellent questions and highly relevant discussion. Many of the participants asked questions and took part in the discussions (see section 3.2.2 for topics). Although some participants had attended fatigue management presentations in the past, the workshop offered a greater opportunity for involvement and

information sharing. It is hoped that this opportunity will help the participants to better appreciate how to apply these strategies and benefit from them.

3.2 Response from Participants

The workshops appeared to be successful. Participation during the workshops was high, due to both the nature of the workshops and the enthusiasm of the participants. The responses in the questionnaires, provided at the end of the sessions for participants to provide their evaluation of the workshop, indicated that they enjoyed the sessions and benefited from the experience.

3.2.1 Level of Participation

The all day MPW session was designed to encourage discussion and information sharing amongst the participants. Participants were advised that they could ask questions at any point during the workshop. Also, the trainer asked participants to provide information about their own experiences. This provoked discussion about useful strategies and limitations of their application. It also raised issues about what aspects of sleep were compromised, how providing good coverage and service conflicted with their biological rhythms, and how improvements to the system would alleviate some of these problems.

Some had already done their own research on fatigue management and were happy to share this information with others. They were also able to bring technical aspects into the perspective of the marine pilot and operational constraints. For example, in the experience of pilots, fatigue is an even greater issue for ships' crews that must navigate the entire St. Lawrence-Great Lakes system, often stretching the capabilities of their personnel and compromising bridge resource management (BRM) processes.

3.2.2 Issues Discussed

Rest and recovery periods

Many participants asked about the appropriate length of rest and recovery periods. They were interested in knowing how much time off between assignments pilots require to be able to maintain their performance. Discussions ensued regarding the impact of taking many short assignments in a row with less than eight hours off in between. The pilots felt that at times they were not able to obtain adequate restful sleep between these assignments and found that they were becoming increasingly more fatigued toward the latter assignments. They suggested that more time off between assignments where they were not on call might alleviate some of the sleep loss that often occurred during busy periods. Several pilots voiced this concern in two of the sessions, particularly harbour pilots and those working shorter assignments on the river. From a biological standpoint the issue is valid, since working for several days with only short rest/recovery periods does lead to sleep loss and a building sleep debt. Being on call during those times where sleep is expected to be obtained also leads to inefficient and poor sleep (see the

discussion on call-backs below). Pilots are constantly waiting for the phone to ring during these on-call periods. This is not very sleep inducing and results in an inability to use this time to pay back a sleep debt (sleep lost after handling several assignments) while waiting for the call.

Scheduling

The pilots say that trying to plan sleep is exceedingly difficult when working the "tour de role" during busier times. The "tour de role" was adopted to provide equal opportunity for pilots to satisfy their commitment to the system and subsequently be paid in full for their services. The system allows pilots to work their allocated number of assignments over a reasonable time period where adequate time off between assignments can be achieved. However, the system can become less effective in this latter function during busy periods when pilots may move to the top of the "tour de role" very quickly, reducing the time between assignments significantly. A pilot who has just completed an assignment may be called up again only a few hours later.

Collective agreements do have rules about the provision of adequate time between assignments by providing limits on the amount of time worked and time off, particularly on assignments beginning between 22:00 and 04:00 or ending between 00:00 and 06:00. On these night assignments, pilots cannot be called for duty before 06:00 the following day (i.e. to obtain 24 hours of rest). In the U.S. Coast Guard, pilots can take a 36-hour break following two night transits.

These limits only apply, however, if pilots desire to abide by them. If pilots wish to accept an assignment they may do so, regardless of the rules on limits. This situation allows the pilotage to maintain service during busy periods. The danger, however, is that pilots may take on more than they should, from a physiological point of view. The problem arises when pilots become so fatigued that their judgement becomes impaired. Under such circumstances, people are often poor judges of their own level of fatigue and may feel they can squeeze in just one more assignment. When there are external pressures encouraging them to take the assignment, it may be too easy to agree.

The pilots suggested that the marine system scheduling constraints can cause a situation where the pilotage is left with having to absorb delays, causing pilots to spend valuable time that could be used for sleep waiting at dockside or at locks for a ship to arrive. This waiting time is limited by the collective agreements, but agreements often contain clauses that offset the waiting time with additional pay. Pilots may be encouraged to take the assignment and endure the necessary waiting period, which results in a very long workday. They acknowledge that the number of hours awake may be dangerously long. They suggested that they would rather have a situation where they could rely on a ship's arrival and be better able to plan their sleep period and the timing of the hours they are expected to be awake for their assignment.

Both pilots and management discussed the poor communication channels that often exist between the shipping companies, their agents and the pilotage. Information either arrives at the wrong time (i.e. is too late), is inaccurate (i.e. consists of times that are not based on proper analysis), or is not provided at all (i.e. updates are not sent to the pilotage).

This type of situation can result in the expansion of the amount of time a pilot may be expected to be on call, disrupts attempts to plan adequate sleep, and increases the chances that pilots may have to remain awake for excessively long periods.

The pilots pointed to dispatcher constraints as the major source of the problem of trying to plan their rest periods. These constraints are often due to the poor communications and scheduling difficulties discussed above. Dispatchers must be able to handle assignments for several pilots while following the "tour de role". They must do this according to information provided by the agents. The result is uncertainty about when ships will arrive at the staging area. Pilots suggested that getting to sleep and staying asleep during busy periods can be a problem because of this uncertainty.

Call-backs

The pilots working the Cornwall-to-Cape Vincent area (District 1) and the harbour pilots in LPA must respond to dispatcher requests during their time on the "tour de role". The dispatcher must give pilots 6 hours of lead time. Ideally, if the pilots know approximately when the ship is to arrive, they can plan to sleep prior to the potential 6-hour lead-time period. The dispatcher either calls sometime after the beginning of this potential lead-time period or the pilots may call the code-a-phone number and listen to the latest information of the estimated time of arrivals (ETAs) of each ship. In the past, pilots could obtain the information from the Internet but now cannot access the website, which has been made secure. A site of this type should be made available to pilots, who could log in with a secure password. During this potential lead-time period pilots may try to nap, although most of the MPW participants claimed they had difficulty trying to sleep during this time. If a pilot works an assignment that takes 9 hours, he/she may be awake for about 15 hours or more (6-hour lead time + travel time + 9-hour assignment), depending on when he/she woke up from the prior sleep period, and the travel time to the staging area.

Some participants said that during their work cycle they were often awake long hours, got a few hours of sleep, particularly if sleeping during the day, then took another assignment. So despite having the option to take a full 14 hours of rest, for example, to recover, some pilots during the busy season continued to take assignments as they came, according to their position at the top of the "tour de role". On the other hand, some participants said that they would definitely take the obligatory number of hours to recover, according to their collective agreement, before accepting the next assignment, even during the busy season. They realized that they were not able to get the minimal amount of sleep they needed to function properly.

Managers are aware of this problem and said they are looking at ways to ensure that pilots get an adequate opportunity for rest between assignments. They said that it is difficult, logistically, to provide adequate service to the shipping companies and still be able to provide pilots with assignments that fit their biological rhythms. Since, during some times of the year, workloads for pilots can be low enough to allow the pilotages to accommodate their physiology and provide good coverage, there is potential for looking at scheduling rules to take pilot physiology into account. However, during busier periods,

this may be almost impossible. Part-time pilots are available to relieve some of the pressure on pilots to work too many assignments and for too long. However, for some busy periods such as at the beginning and end of the season, all pilots are working without much relief.

Application of countermeasures

Several participants said they have set up excellent sleep environments according to good information obtained through past fatigue management sessions or from books on sleep by reputable authors (e.g. Maas, 1998). However, they still had a great deal of trouble trying to get to sleep or stay asleep. The latter problem seemed to be the most prevalent. Even following strict rules about caffeine or alcohol consumption, etc. prior to turning in, these individuals were still not able to remain asleep. Even when they were shown that they could obtain barely two hours of sleep during certain times of the day, they indicated that they were still having difficulty even at those times when they should be able to sleep more. Their insomnia is probably due to disrhythmia, since their biological rhythms were likely severely disrupted by their irregular work and rest cycle. The best solution to this problem is the adoption of effective natural relaxation and sleep inducement techniques, and the removal of the anxieties that disrupt sleep (e.g. being called to work).

The use of melatonin was discussed and several questions were asked about its effectiveness for inducing sleep and how safe it was. The fatigue management expert who developed the workshop and was present for the session said that melatonin and several other herbal remedies were available but did require care in their use. He referred the participants to books such as the one by Dian Dincin Buchman (1997) that talk about the use of such natural remedies. He also said that melatonin is produced in tiny amounts by the body, far less than in the tablets sold in the drug store. Also, no long-term studies have been completed to test for side effects, so extreme caution is required. The body may, for instance, reduce its own production of melatonin if the substance is artificially introduced into the system, particularly in large amounts. Other potential problems may exist as well, so further research is required.

Several pilots wanted to know the ideal times when they should sleep. They were very interested in the graphs showing the times where sleepiness and alertness are highest, and the graph showing the amount of sleep people can obtain throughout the 24-hour day. They felt that balancing the length of time and ease of getting to sleep would help them plan naps and sleep periods. Others were interested in the effectiveness of splitting their sleep periods to coincide with their biological rhythms. They were happy to hear that if they pay attention to the time of day, they may be able to recover some types of lost sleep (e.g. rapid eye movement – REM, and non-REM or slow wave sleep) during times when they are best obtained.

Several pilots described the difficulties they had trying to maintain regular meal schedules. Some said that they found that eating their meals according to their changing work/sleep cycles was better than trying to stick to the “normal” three-meal-a-day, morning breakfast, afternoon lunch, evening dinner, schedule. Going with the flow was preferable to forcing the “normal” rhythm onto their already disrupted bodies. They also

suggested that because they found eating a useful way to cope with working nights, having a main meal at night seemed to give them the energy to carry on. In fact, all ships follow a meal schedule that provides a night meal to the crew who are on watch. However, some pilots were concerned about the impact of heavier foods on their bodies during the night and elected to eat light and drink water and fruit juice instead, avoiding the food offered by the ship's crew.

Many pilots pointed out that their irregular hours make it very difficult to plan meals so they try to eat whenever they are hungry and the opportunity arises. The trainer suggested that planning meals even when working irregular hours can be achieved by bringing food aboard ship and eating it when the timing is more appropriate biologically. Of course, if the operation at the time does not permit this, then pilots should eat as close as possible to the ideal time.

There was a great deal of interest in the use of stimulants and their effects on the body. Questions were asked regarding the safety of using over-the-counter products like No Doz, Vivarin, and Caffedrine. Since the latter two products contain double the amount of caffeine found in drip-brewed coffee, the safety of using these products was discussed. The pilots were made aware of the cautions for their use and the fact that certain conditions such as hypertension, high blood pressure, and cardiac- and kidney-related conditions may be made worse by the use of caffeine. It was suggested that pilots should consult their doctor about using such caffeine-based medications.

The topic of napping drew many participants into the discussion. Pilots emphasized the inability to nap while handling river and lock transits, saying that their attention is required throughout these assignments, when the ship is underway or being actively kept stationary (i.e. not anchored or tied to a dock or pier). The only time pilots seemed comfortable with taking a nap was during lake transits when weather, traffic, ship and crew conditions were favourable. Other times that pilots thought napping might be possible and useful were during waits for ships (if there was a place to comfortably and safely nap), at home when anticipating a call, or when they needed to augment lost sleep. Pilots can anchor a ship and sleep if they feel they are too fatigued to continue safely, regardless of the location, as long as it is safe to do so.

Other strategies discussed by pilots for keeping alert while aboard a vessel included taking a run on the deck when the ship was held up waiting for entrance to a lock, taking a walk on the deck, opening some windows, going outside into the cold, doing jumping jacks, and talking with the ship's crew.

Impact of levels of fatigue of ships' crews

Pilots in all three workshops pointed out that reduced performance of the ship's crew due to high levels of fatigue caused increased stress to the pilots and made their job even more critical. Reductions in crew size have increased the instances where the same people are used to navigate the entire system, severely reducing their opportunity for sleep. Since these crews do not benefit from adequate fatigue management training, it is up to a fresh pilot to lead the crew through unfamiliar and difficult navigational conditions when these crews are severely impaired. Hence, the pilot must be prepared to

make up for the crew's degraded state. This appears to be a common view amongst most of the pilots and indicates the greater need for pilots to be well rested. Since ships' crews will be very limited in number, it is very likely that these crews will benefit greatly from the assistance of a skilled, alert pilot.

Unfortunately, this means that the pilot often has to work alone, according to comments by pilots in all MPW sessions. Pilots said that adequate BRM was not possible when crews were in a severe state of fatigue. The pilot would have to verify the information that crew provided and in many cases would have to correct crew actions.

Use of taxis versus own vehicle

Fatigue is known to degrade several cognitive functions, causing poorer control of a vehicle and reduced attentiveness. The evidence of degraded driving performance when drivers become fatigued and drowsy continues to dominate the literature on fatigue and performance. Several recent articles reinforce the earlier studies (see Desai, et al., 2003; Landstrom, et al., 2002; Stutts, et al., 2003; and Thiffault and Bergeron, 2003). Since pilots are very aware of this fact, they discussed the use of taxis to get them home safely after assignments, particularly night or longer assignments. Many questioned the safety of these taxi services, citing situations where drivers were themselves sleep deprived or just incompetent. Others pointed out that the vehicles used by some companies were unsafe and ready for the scrap heap. The pilots stated that they would prefer to take advantage of sleeping accommodations to rest before driving home, rather than trust the taxi services. Such accommodations at strategic locations would also be useful so that pilots could rest before assignments if the ship is expected to be late. Pilots remarked that some of their best sleep is obtained in a hotel room that is quiet, dark and free of distractions.

3.2.3 Recommendations from Participants

The participants made the following recommendations in discussions during the workshop sessions:

- Have agents, owners and ships' crews take fatigue management (FM) training;
- Have all remaining pilots, dispatchers, management and support staff receive FM training;
- Review collective agreements to ensure they reflect FM concepts where appropriate; and
- Review the present marine system and identify areas where improvements are necessary to ensure that fatigue can be reduced to safer levels.

3.2.4 Areas Where Participants Appeared to Get the Most Benefit from the Workshop

According to comments made during the workshops, participants appeared to get the most out of the workshop in the following areas:

- Information about the structure of sleep and how biological rhythms can disrupt this structure;
- Use of knowledge about how biological rhythms affect sleep duration and structure to plan naps and sleeping periods;
- Use of natural substances that do not have the severe side effects and health risks of prescription drugs.

3.2.5 Evaluation Questionnaire

The following sections describe the results of the questionnaire handed out to the participants at the end of the workshops. The results show an overall favourable response (i.e. the workshop was successful).

The total number of participants who completed a questionnaire was 33. Figure 1 shows the breakdown for each location. These numbers are close to the actual attendance figures.

Table 1: Number of Participants Attending the Workshop

Location	Number of Participants	Number of Questionnaires
Cornwall	10	7
Quebec City	15	12
Montreal	16	14
Total	41	33

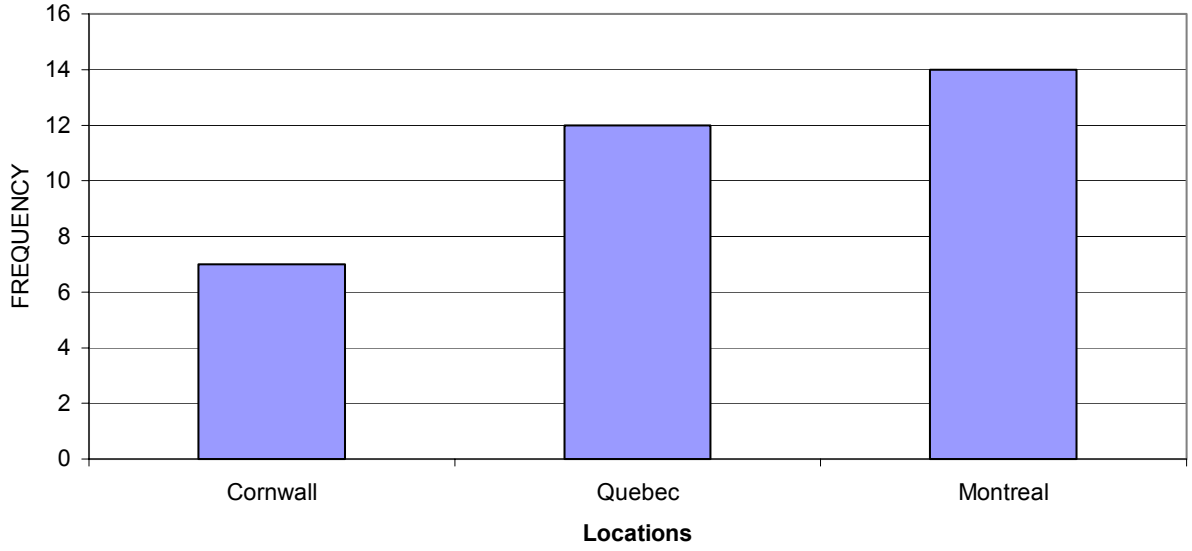
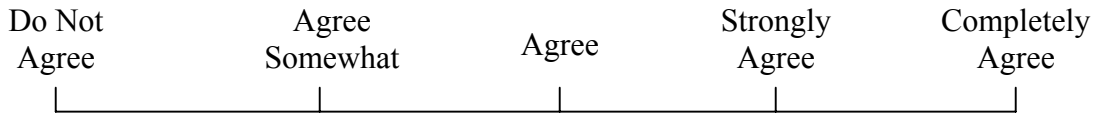
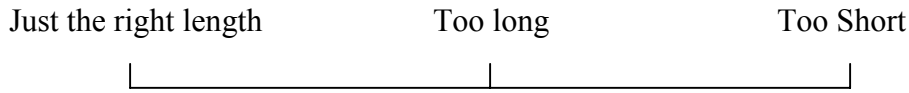


Figure 1: Number of Participants Answering the Questionnaire

The answers for all but question 5 were based on the following scale:



Question 5 used the following scale:



Presentation

The format and style of presentation worked well. It was evident, however, that for a workshop to be successful, the trainer must have an adequate understanding of the material and its background. The success of these workshops was due to the fact that an experienced instructor in fatigue management and shiftwork issues accompanied the trainer who conducted the Montreal and Quebec City workshops. The trainer had just completed the TTT workshop and required support during these sessions. Given the depth of the questions and the required answers, the newly trained trainer had to defer some questions to the assessor. However, given time to prepare for this level of questioning, the trainer would be able to field them in future. The experience of conducting two to three workshops should result in a better understanding of the nature of the questions and the depth of knowledge required to provide adequate answers. On the

other hand, having an expert in sleep, chronobiology or shiftwork issues available for some part of or the entire workshop adds credibility. In this case, the expert who was present was one of the authors of the marine pilot FMP, the pilots' guide and the trainer's handbook. This may have encouraged some of the participants to seize the opportunity to have some of their questions answered.

Material

The material covered in the workshop appeared to be adequate and satisfied most of the pilots, providing them with the information they sought. However, two pilots did point out that more could be done to make the material more relevant to their specific situations, particularly regionally. This included the differences between harbour, river, lake and coastal pilots. Although the material does deal with these differences, it is suggested that more examples for the specific groups be used to demonstrate how strategies can be applied to these different situations. It is recommended that the pilotages observe and analyze these differences and adapt the prototype FMP to the different pilotage environments by taking these differences into account when planning specific fatigue countermeasures for their work setting.

Question 1: The presenter delivered the workshop in a clear and understandable manner.

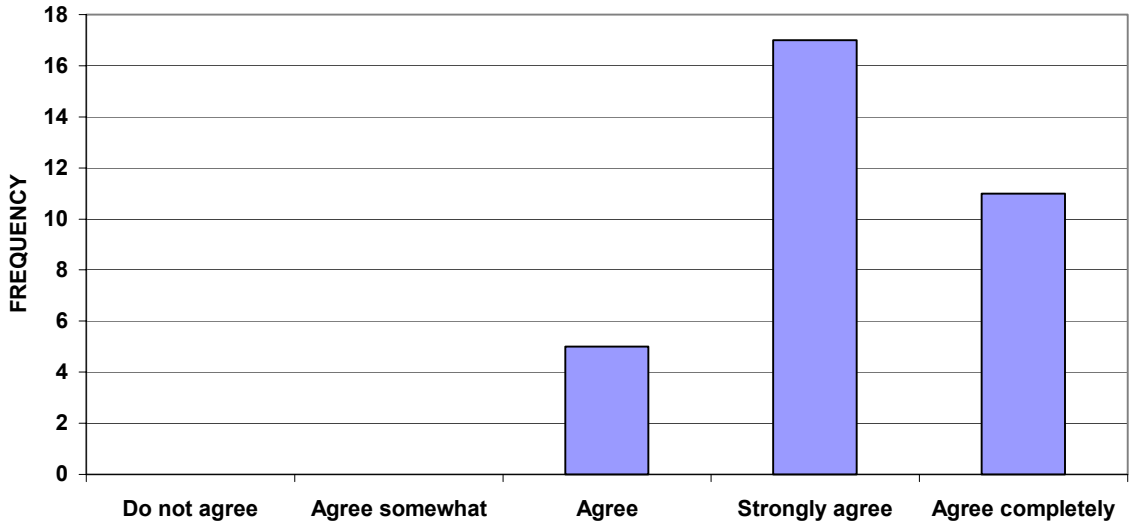


Figure 2: Responses to Question 1

Question 2: The presentation was dynamic and interesting.

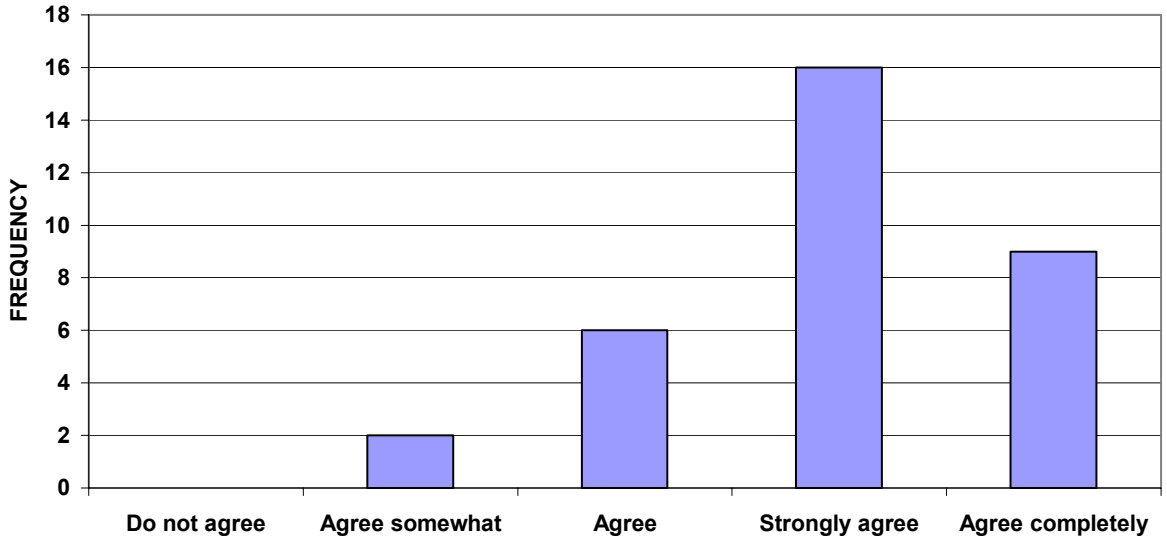


Figure 3: Responses to Question 2

Question 3: The presenter did a good job of drawing the participants into discussion and participation.

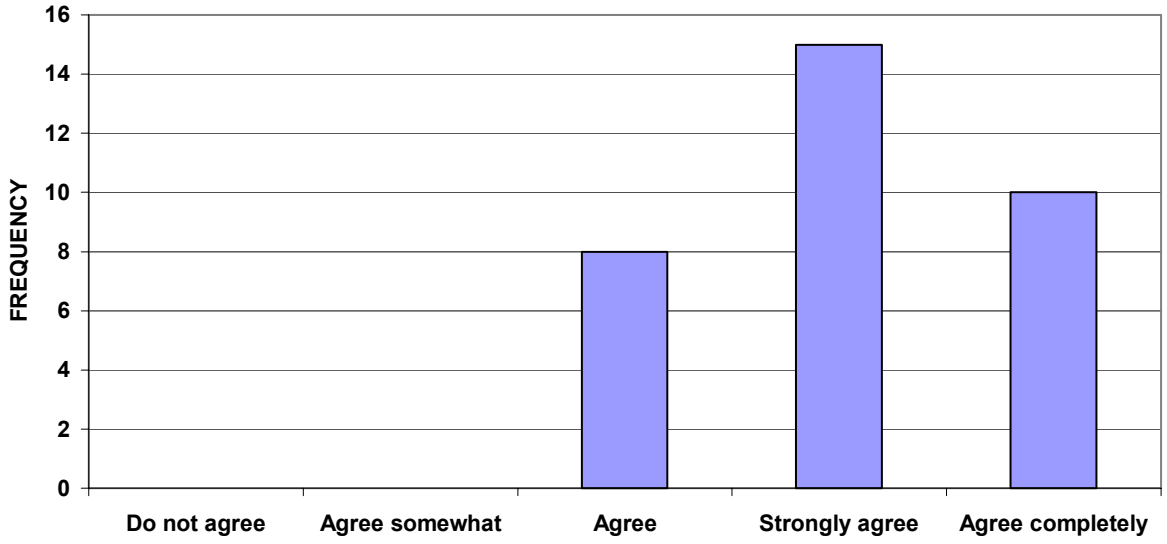


Figure 4: Responses to Question 3

Question 4: The presenter did a good job of answering questions.

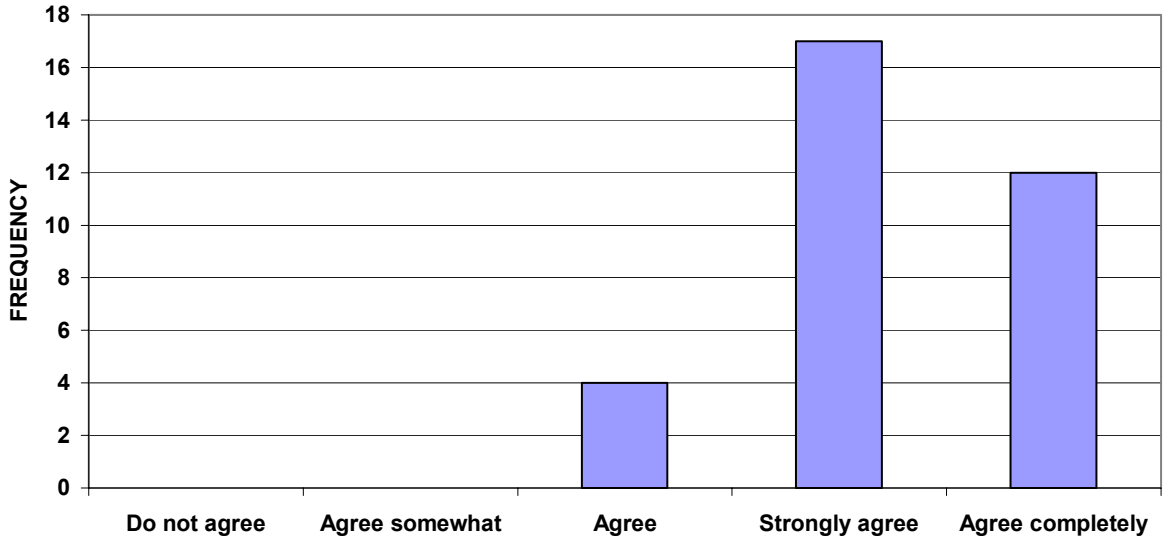


Figure 5: Responses to Question 4

Question 5: I found that the workshop was:

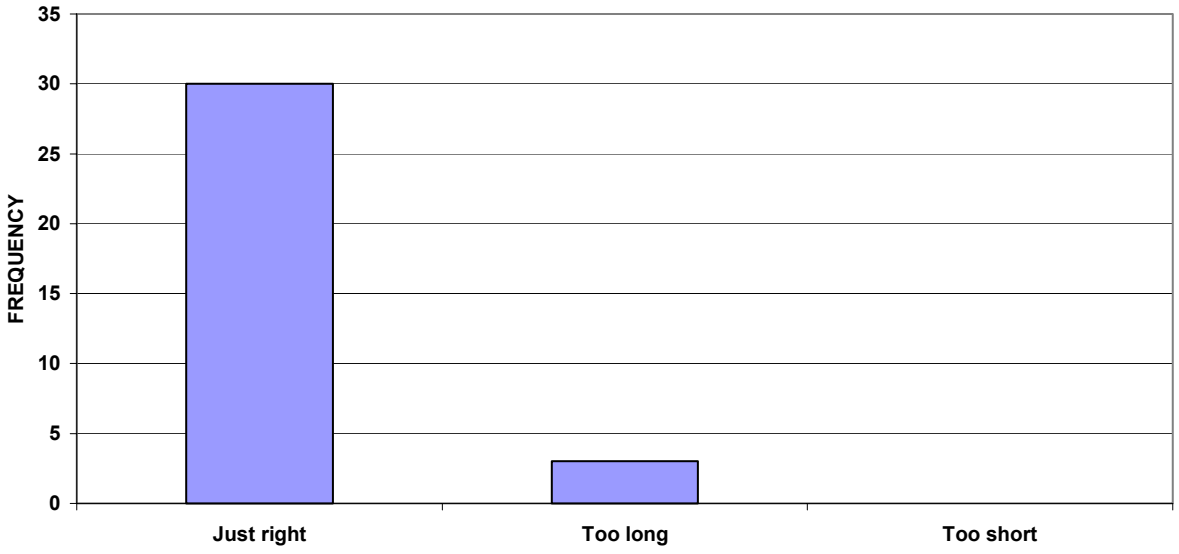


Figure 6: Responses to Question 5

Question 6: I learned most of what I wanted to know about fatigue management.

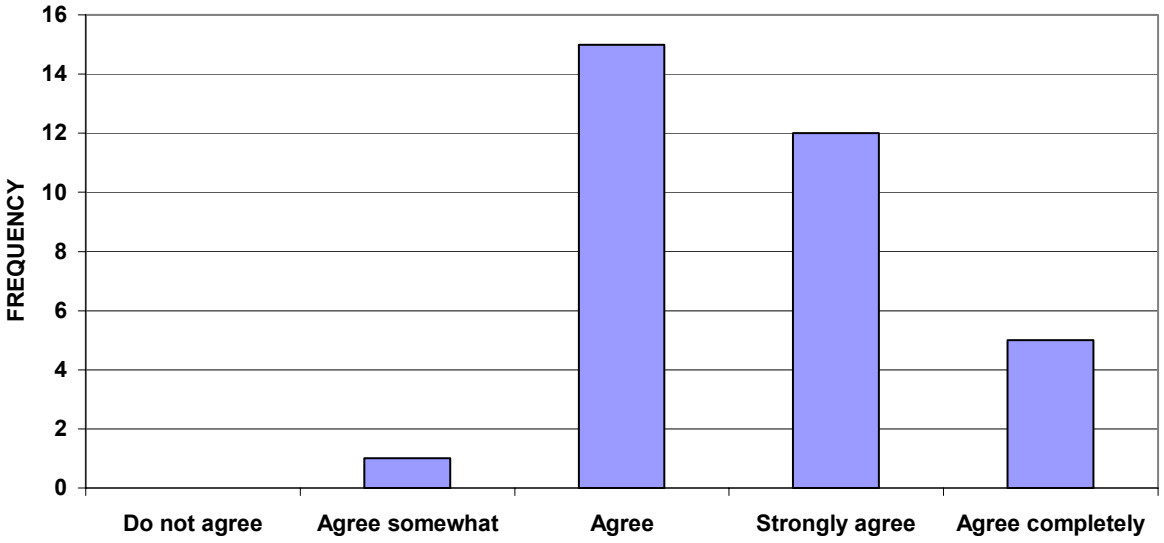


Figure 7: Responses to Question 6

Question 7: I found the material helpful.

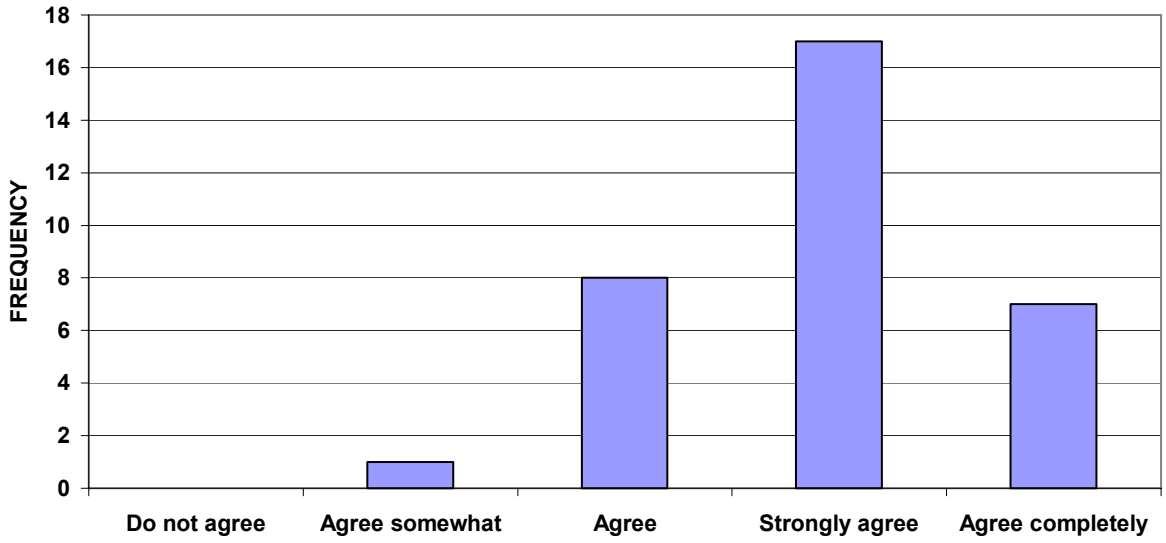


Figure 8: Responses to Question 7

Question 8: I now feel that I understand the area of fatigue management much more than before.

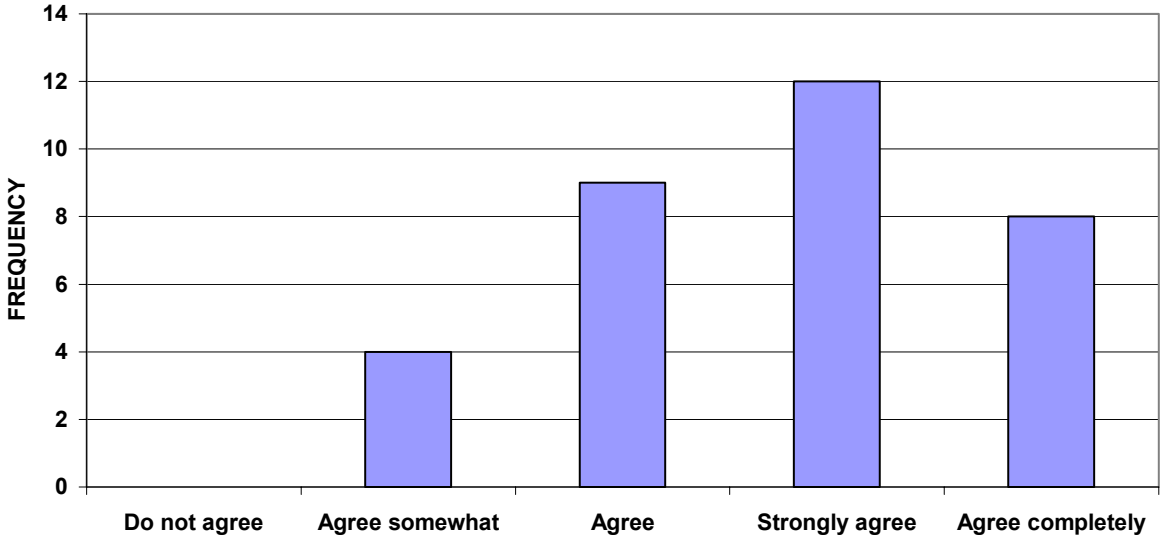


Figure 9: Responses to Question 8

Question 9: I feel confident that I will be able to apply the strategies that could best help me manage fatigue.

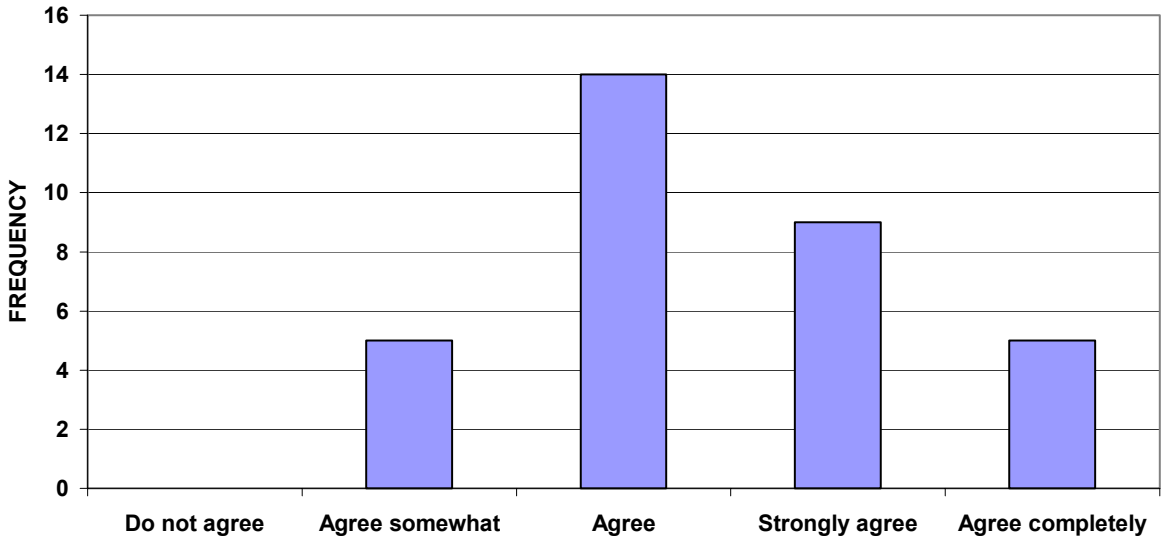


Figure 10: Responses to Question 9

Question 10: I feel that this workshop presented all the required information.

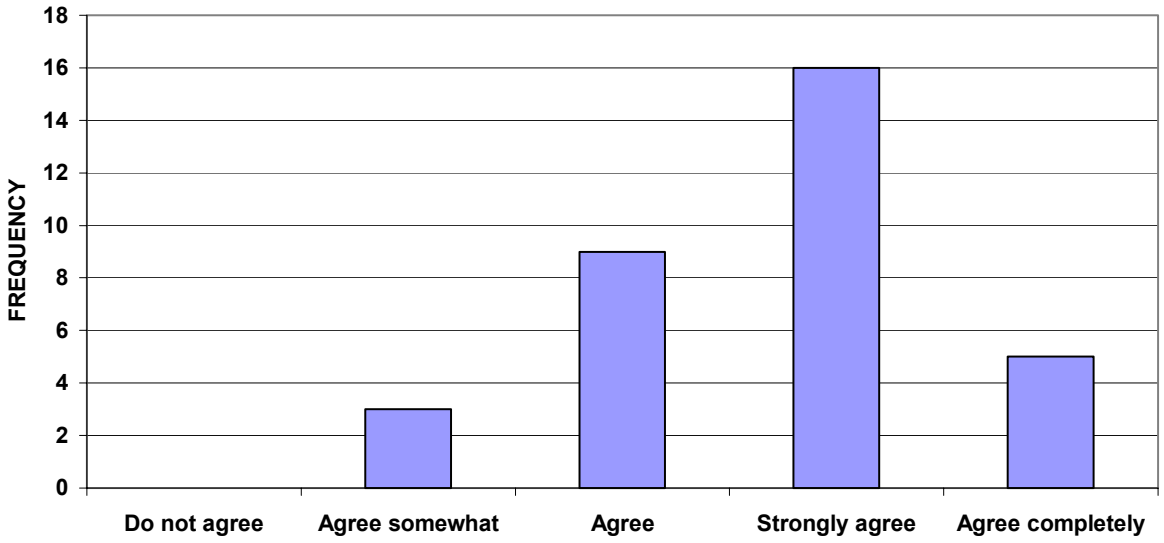


Figure 11: Responses to Question 10

Question 11: Overall, I feel that this workshop was worthwhile.

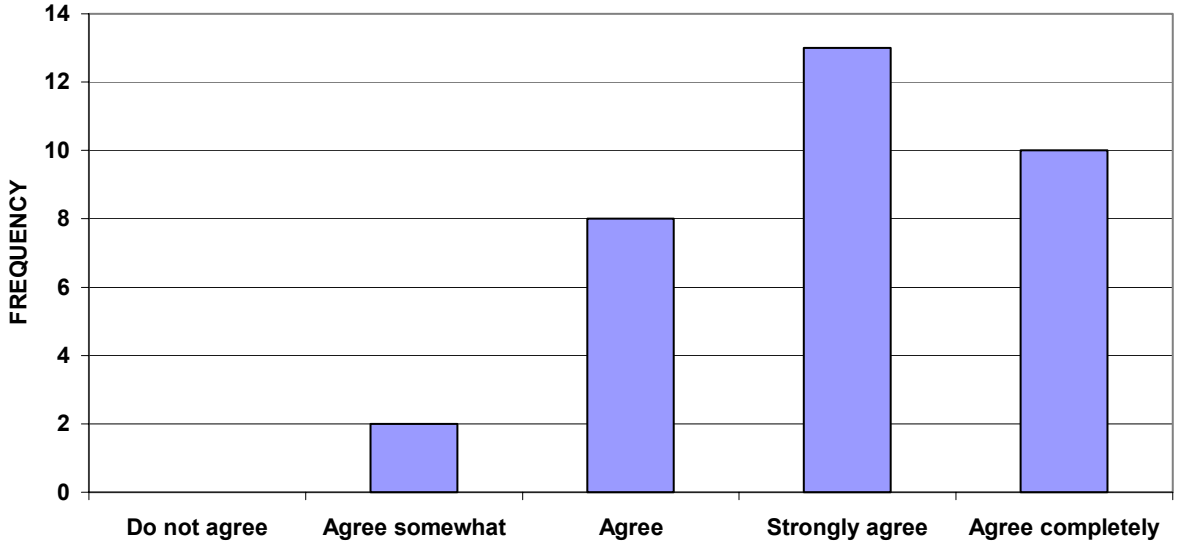


Figure 12: Responses to Question 11

Question 12: I would recommend this workshop to my colleagues.

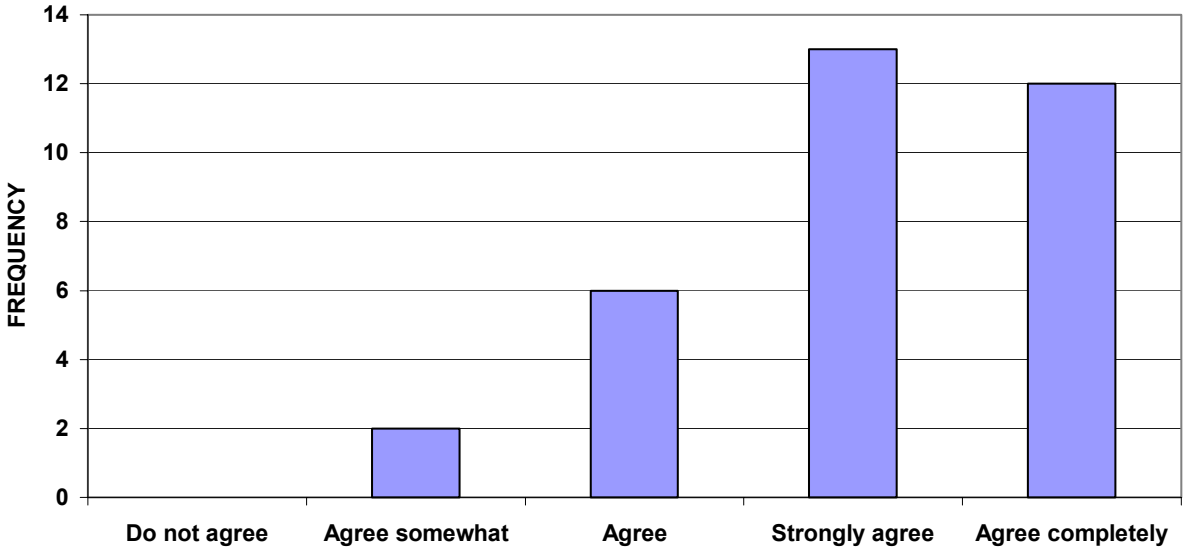


Figure 13: Responses to Question 12

Question 13: Do you have any other comments you would like to share?

Table 2: Open-ended Responses from Question 13

Location	Open-ended Response
Cornwall	Feedback, confrontation, discussions, - best way to keep me interested and from falling asleep.
	Calculation of sleep debt by pilots.
	The only problem is that I have been through three fatigue sessions in three years and modify working rules to comply with the (fatigue) study.
Montreal	Les arrangements d'échelles de pilotes influencent sur le stress du pilote. *(Pilots' ladder set-ups influence their stress.)*
	Meilleure collaboration des agents maritimes quant à la diffusion de l'information sur les heures requises de prestation de service de pilotage. *(Better collaboration from marine agents regarding the distribution of information on the required hours that will benefit pilotage.)*
	Cet atelier a rencontré mes aspirations afin d'essayer de mieux gérer mon sommeil pendant le jour. *(This workshop has met my expectations in trying to better manage my sleep during the day).*
	Merci pour vos très bons commentaires. J'ai appris beaucoup sur le sujet. *(Thank you for your very good comments. I learned a lot on the subject.)*
	Bonne présentation « PowerPoint » – Bonne animation. *(Good PowerPoint presentation. Well-conducted workshop.)*
	Guide bien fait, requiert peut-être l'ajout de quelques graphiques avec les explications associées et pertinentes. Merci. *(Guide well done, maybe requires the addition of some graphs with associated and significant explanations. Thank you.)*
	Mettre plus de graphiques explicatifs dans la publication. *(Put more explanatory graphs in the publication.)*

Table 2. Open-ended Responses from Question 13 continued

Location	Open-ended Response
Montreal Cont.	Enfin ma conjointe peut comprendre mes problèmes de sommeil grâce à votre document et je peux les gérer plus facilement. *(Finally, my spouse can understand my sleep disorders thanks to your document and I can manage them more easily.)*
	Sujet intéressant – Présentation dynamique et stimulante. *(Interesting topic – Dynamic and stimulating presentation.)*
Quebec City	Il est important de prendre conscience de la fatigue lorsqu'on travaille sur des quarts irréguliers et d'essayer de prendre le temps de sommeiller. Il est bon de voir un travail fait sur le sujet et de voir à présent et à la suite d'études ce que beaucoup de nos confrères avec l'expérience des années essayent de mettre en pratique. Merci. *(It is important to be aware of fatigue while we work on irregular shifts and to try to take the time to sleep. It is great to see that work has been done on the subject and many of our colleagues, with years of experience, put the knowledge into practice after many studies.)*
	Chaque secteur de pilotage est différent et il est certainement impossible d'en faire une règle générale. Merci. *(Each pilotage sector is different and it is certainly impossible to make it a general rule. Thank you.)*
	J'ai très apprécié de participer à cet atelier et cela me rendra la vie plus facile dans mon travail et la vie de tous les jours. *(I greatly appreciated participating in this workshop and it will simplify my life at work and on a daily basis.)*
	Sans discipline et volonté, il peut être difficile de mettre une application toutes les recommandations du sujet. Je vous remercie d'avoir effectué cette étude. Elle contribuera sans doute a de meilleures performances de la part des pilotes maritimes. *(Without discipline and will power, it could be difficult to apply all the recommendations on the subject. I thank you for having done this study. It will contribute without a doubt to better performances on behalf of the marine pilots.)*
	J'aurais souhaité un peux plus de références – sites Internet – lectures personnelles – études – Merci. *(I would have liked a few more references – internet sites – personal readings – studies – Thank you.)*

Table 2. Open-ended Responses from Question 13 continued

Location	Open-ended Response
Quebec City Cont.	Quelques graphiques présentés à l'écran doivent être ajoutés au TP. *(Some graphs presented on screen must be added to the TP.)*
	Très dynamique. Merci. *(Very dynamic. Thank you.)*
	Cet atelier m'a permis de mieux gérer ma préparation envers le sommeil. J'ai apprécié. *(This workshop permitted me to better manage my sleep preparation. I appreciated it.)*
	Excellent. Merci. *(Excellent. Thank you.)*
	Très satisfait d'avoir participé et réalisé que mes confrères vivent la même réalité. *(Very satisfied for having participated and realized that my colleagues are living the same reality.)*

3.3 Participants' Ratings of the MPW

Figures 2 through 13 show that the participants generally rated the workshop as worthwhile. The majority felt they would recommend the workshop to colleagues and indicated that they learned more about fatigue management. They felt that the workshop was helpful and contributed to their understanding of the material. They agreed that the workshop was mostly complete and the delivery was rated highly. There appeared to be some indications that the application of strategies may be difficult and that more material may be desired. However, judging from the lively discussions throughout the workshops, the interest in this subject is high and it is expected that the participants will be interested in seeking further information. The participants were very supportive of the concept of fatigue management and were keen on finding ways to apply appropriate strategies to their work environment. In fact, they were adamant about marine companies and ships' crews learning more about fatigue management.

3.3.1 Overall and Regional Ratings

The overall response to the workshop was favourable. The sessions in Quebec City and Montreal were attended mostly by pilots and were more vocal with a greater amount of information sharing. This difference may be due to the group dynamics or may be a result of the fact that the GLPA and several participants, having been involved in the Phase 2 Fatigue Management Program development, had already become familiar with the material.

3.3.2 Areas for Improvement

- Emphasize use of practical information on potential for sleep duration and sleep structure for planning naps and sleep periods;
- Provide a set of guidelines (tools) to help pilots plan naps and sleep periods;
- Include more specific examples for each regional and local application, taking into account the mix in the audience.

4. Conclusions

4.1 Success of the TTT Workshop and MPW

4.1.1 Train-the-Trainer Workshop

The train-the-trainer workshop is effective in preparing an individual with some basic knowledge of shiftwork issues and fatigue to deliver the marine pilot fatigue management workshop. This basic knowledge includes reading the trainer's handbook (TP 13960E) and having a keen interest in the topic. The TTT workshop provided the trainer with the necessary understanding of the material, the ability to discuss points that were still not clear, and the opportunity to present the material while being coached. The trainer felt that he had the confidence to conduct a training session on his own. The fact that, during the two workshops, he demonstrated that he knew the material, had confidence discussing the topics with the participants, and could keep to the scheduled time indicates that the TTT workshop was successful.

The two days were enough to prepare the trainer to deliver the pilots' workshop, given that the trainer had arrived well prepared. The venue worked well to facilitate the workshop and met all requirements. A similar venue should be considered for future TTT workshops: standard size classroom (meeting room) with adequate lighting and ventilation; LCD projector and screen; white board and markers; flip chart; and access to food and beverages nearby.

The trainer successfully drew questions from the participants in the MPWs and engaged them in discussions about relevant information and topics. Participants felt comfortable volunteering their opinions on such topics as fatigue effects on performance, the difficulties of applying strategies such as napping and preparing the sleep environment, and their skepticism of using scheduling tools to improve the "tour de role" process.

It is recommended that TTT trainers be somewhat prepared before attending the TTT workshop. They should study the trainer's handbook (TP 13960E) and read as much as they can as listed in the references section of the handbook.

4.1.2 Marine Pilot Workshops

The marine pilot fatigue workshops were very successful from the point of view of most of the participants and from observation. The material was fully covered; participants became very involved in the discussion of many relevant topics and contributed to the learning process; participants gave positive responses to all questions on the post-workshop questionnaire; and the experience was verbally praised.

The workshops met all of the evaluation criteria including:

- Adequate duration;
- Acceptable level of material that was understandable;
- Clear delivery;
- Complete coverage of the material included in the pilots' guide and presentation;
- Considerable relevant discussion;
- Good participation;
- Satisfactory answers to all questions;
- Material deemed useful, helpful and complete by participants.

4.3 Implications for the Pilotage and Marine Industries

The success of the training modules indicates that they are recognized as worthwhile by both management and pilots, and provide an excellent forum for discussing the topics of sleep, biological rhythms, fatigue, and coping strategies. The MPW provides both the basic information required and the opportunity for exploring and sharing relevant information. As this marine pilot fatigue management workshop was a prototype, some modification will be required to adapt it to all pilotage work environments. Mostly it will involve the addition of different specific examples and some differences in emphasis (e.g. lake versus river versus harbour versus coastal conditions). These modifications will ensure that the training is even more beneficial to the participants.

References

Baker, A., Fletcher, A., Heiler, K., and Dawson, D. (2001) *Practical Living for Shiftworkers*. Adelaide SA; University of South Australia – Centre for Sleep Research.

Buchman, D. (1997) *The Complete Guide to Natural Sleep*. New Canaan; Keats Publishing.

Desai, A., Ellis, E., Wheatley, J., and Grunstein, R. (2003) Fatal distraction: a case series of fatal fall-asleep road accidents and their medicolegal outcomes. *Medical Journal of Australia*; 178(8):396-9.

Landstrom, U., Englund, K., Nordstrom, B., and Stenudd, A. (2002) Use of temperature variations to combat drivers' drowsiness. *Perception and Motor Skills*; 95(2):497-506.

Maas, J. (1998) *Power Sleep*. New York; Harper-Collins.

Stutts, J., Wilkins, J., Scott Osberg, J., and Vaughn, B. (2003) Driver risk factors for sleep-related crashes. *Accident Analysis and Prevention;* 35(3):321-31.

Thiffault, P. and Bergeron, J. (2003) Monotony of road environment and driver fatigue: a simulator study. *Accident Analysis and Prevention;* 35(3):381-91.

Appendix A: Questionnaires

1. Train-the-Trainer Workshop Questionnaire
2. French Version of the Pilots' Workshop Questionnaire
3. English Version of the Pilots' Workshop Questionnaire

TRAIN-THE-TRAINER WORKSHOP QUESTIONNAIRE

Train-the Trainer Course Evaluation

Trainer: _____ **Date:** _____

Number of Participants: _____

Presentation

1. The presenter delivered the workshop in a clear and understandable manner.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

2. The presentation was dynamic and interesting.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

3. The presenter did a good job of drawing the participants into discussion and participation.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

4. The presenter did a good job of answering questions.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

Course Material

5. I learned most of what I desired to know about fatigue management.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

6. I found the material helpful.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

7. I now feel that I understand the area of fatigue management much more than before.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

8. I feel fully confident that I will be able to deliver a successful target fatigue management session on your own.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

9. I feel that I have all of the information I need to conduct my first training session on my own.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

10. I feel that I would need to practice the target workshop delivery more.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

11. I feel that all important information was included in this workshop.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

12. Overall, I feel that this workshop was worthwhile.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

13. I would recommend this training session to my colleagues.

Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

Do you have any other comments you would like to share?

_____

_____

_____

_____

_____

Thank you for participating in the fatigue management train-the-trainer course for marine pilot trainers.

FRENCH VERSION – PILOT WORKSHOP QUESTIONNAIRE

Évaluation de l'atelier par les participants

Formateur : _____ **Date :** _____

Présentation

1. Le présentateur a donné l'atelier d'une manière claire et compréhensible.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

2. La présentation était dynamique et intéressante.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

3. Le présentateur a bien amené les participants à la discussion et à une participation active.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

4. Le présentateur a su répondre correctement aux questions des participants.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

5. La durée de l'atelier était :

Juste de la bonne longueur | Trop longue | Trop courte

Matériel de l'atelier

6. J'ai pu apprendre la majeure partie de ce que je voulais savoir sur la gestion de la fatigue.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

7. J'estime que le matériel était utile.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

8. Je comprends désormais beaucoup plus ce qu'est la gestion de la fatigue.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

9. Je suis sûr de pouvoir mettre en pratique les stratégies qui pourront le mieux m'aider à gérer la fatigue.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

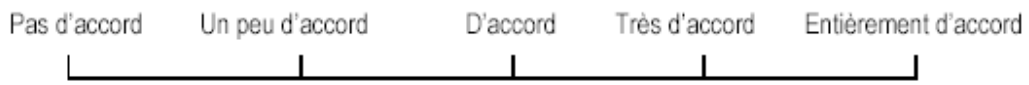
10. J'ai le sentiment que l'atelier a présenté toute l'information nécessaire.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

11. Dans l'ensemble, je pense que l'atelier en valait la peine.

Pas d'accord | Un peu d'accord | D'accord | Très d'accord | Entièrement d'accord

12. Je recommanderais cet atelier à mes collègues.



13. Utilisez l'espace ci-après pour nous faire part de vos commentaires.

Nous vous remercions de votre participation à l'atelier.

ENGLISH VERSION – PILOT WORKSHOP QUESTIONNAIRE

Participant's Workshop Evaluation

Trainer: _____ **Date:** _____

Presentation

1. The presenter delivered the workshop in a clear and understandable manner.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

2. The presentation was dynamic and interesting.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

3. The presenter did a good job of drawing the participants into discussion and participation.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

4. The presenter did a good job of answering questions.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

5. I found that the workshop was:

Just the right length | Too long | Too Short

Workshop Material

6. I learned most of what I wanted to know about fatigue management.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

7. I found the material helpful.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

8. I now feel that I understand the area of fatigue management much more than before.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

9. I feel confident that I will be able to apply the strategies that could best help me manage fatigue.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

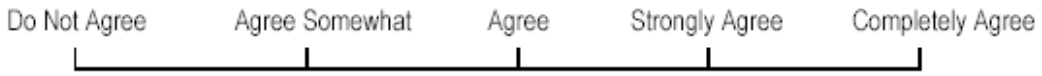
10. I feel that this workshop presented all the required information.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

11. Overall, I feel that this workshop was worthwhile.

Do Not Agree | Agree Somewhat | Agree | Strongly Agree | Completely Agree

12. I would recommend this workshop to my colleagues.



13. Do you have any other comments you would like to share?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Thank you for participating in the workshop.

Appendix B: Observational Format

1. Gains participants' attention. Yes No

2. Allows participants to ask questions or discuss relevant issues.
   Yes No

3. Delivers workshop in a clear, understandable manner.
   Yes No

4. Sticks to the topic at hand and does not diverge onto non-relevant tangents.
   Yes No

5. Uses examples to clarify a point. Yes No

6. Keeps workshop moving at an acceptable pace.
   Yes No

7. Overhead slides are effective. Yes No

8. All information is covered. Yes No

9. Overheads flowed and did not cause disruptions.
   Yes No

10. All slides were understandable. Yes No