

SCRIPT
FOR
AWO PRESENTATION

CREW ENDURANCE MANAGEMENT SYSTEM
(CEMS)

(Final 16 June 2003)

[SLIDE 01 – opening slide]

Welcome, everyone! I'm excited to have this opportunity to introduce you to a major safety initiative of the Coast Guard - AWO Safety Partnership. Through the Partnership, the Coast Guard and AWO have been working together on high-priority safety issues facing our industry since 1995. Today, the safety issue I want to talk to you about is crew endurance – a challenge in any 24/7 business, including the barge and towing industry. Over the next half-hour, I will introduce you to an innovative approach to the familiar challenge of maintaining safe levels of crew performance day-in and day-out aboard our vessels. Successful implementation of this new program has the potential to be one of our greatest successes.

By now I hope you're asking, "What is this program you're so excited about?" I'll keep you in suspense no longer: it's the Crew Endurance Management System, or CEMS. In today's presentation, I'll introduce you to CEMS, give you an idea of its importance to you and your company, and provide you with information and encouragement on setting up and implementing CEMS within your operations.

No one should be surprised to see us focusing on this issue now. The issue of Crew Endurance is not new to members of AWO; in fact, dealing with this challenge effectively has been on AWO's priority issue list since 1997. In 1999, the Coast Guard and AWO established a Crew Endurance Dialogue Group to promote non-regulatory cooperation on crew endurance issues. The National Transportation Safety Board has repeatedly encouraged all modes of transportation to take more proactive action to address the endurance challenge. And, unfortunately, crew endurance has been directly implicated in a high-profile towing industry accident, the 520 bridge allision in Seattle. In 2002, a Coast Guard-AWO Quality Action Team that examined that incident recommended that AWO partner with the Coast Guard to implement a Crew Endurance Management System for the towing industry. Later that year, the Towing Safety Advisory Committee also endorsed CEMS as "the right approach for addressing and managing endurance and alertness issues in the 24-hour a day environment of towing vessel operations."

AWO has taken a leadership role in addressing this challenge for more than six years. I hope that after hearing today's presentation, you'll be interested in experiencing the benefits of CEMS and motivated to join us in implementing this cutting-edge program in your companies.

[SLIDE 02]

In today's presentation, I'll first give you an overview of what CEMS is, including definitions of Crew Endurance and CEMS, the benefits of implementing CEMS in your company, and a more detailed description of what it takes to successfully implement CEMS. Later, you'll also learn about the support that's in place to assist you in implementing CEMS.

[SLIDE 03]

Let's start with some definitions...

CREW ENDURANCE is the ability to maintain performance within safety limits while enduring job-related physiological, psychological, and environmental challenges.

[SLIDE 04]

CEMS is a system for managing the risk factors that can lead to human error and performance degradation in maritime work environments.

[SLIDE 05]

Why is that relevant? Well, if you've ever stood the after-watch on a tugboat or towboat, or if you've ever driven late at night, especially between the hours of 10 PM and 4 AM, then you know how difficult it can be to maintain safe performance during those hours of the night.

Simply put, operating in a 24 hour-a-day, 7-day-a-week environment presents some very real challenges to our people working on the water: those who navigate our vessels and those who work the decks of our boats and barges.

[SLIDE 06]

Recent incidents have focused attention on our industry and the need for continuous improvement in our operating practices. We have the opportunity now to take positive, proactive steps to develop operating practices that mitigate crew endurance risk factors and improve the quality of life for our people. AWO and its members have always been leaders, not waiting for regulators to tell us how to do our jobs. If for no other reason than this, doing nothing is just not an option.

The good news is that CEMS implementation is a proactive step that each and every one of us can take right now to address this issue. The time is right, the Coast Guard has offered its support and resources; there is no reason to wait!

[SLIDE 07]

To see what I'm talking about, let's first consider energy and alertness levels.

In this slide, the curve going from left to right represents energy and alertness levels. This illustration reveals why people experience a struggle to maintain alertness relative to the time of day.

[CLICK TO ANIMATE]

Now look closely at the area circled. The difficulty in maintaining a safe level of alertness between 10 PM and 4 AM correlates with the dramatic dip of the energy and alertness curve in the illustration.

The reason for that dramatic dip is the human biological clock, found in each and every one of us. Our biological clocks by nature are designed for us to work during the day and sleep during the night.

The only way to prevent performance degradation during the night is by shifting our biological clocks so that sleep occurs during daytime hours and energy is available for work during the night.

[SLIDE 08]

How can performance degradation be prevented?

(CLICK to animate)

As I said, by shifting the biological clock.

But how? You might be surprised to learn that simply changing your sleep and work schedule does not by itself reset this clock mechanism. The only thing that can effectively change the timing of our biological clocks is exposure to environmental light at specific times of the day.

Along with resetting the biological clock, there is another very important factor that affects nighttime as well as daytime performance and can prevent performance degradation.

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That factor is the amount and quality of sleep that a person obtains each day. Scientific research has shown that the human brain needs approximately 7 to 8 hours of uninterrupted sleep each day. Getting less than 6.5 hours of uninterrupted sleep per day, over several consecutive days, will result in sleep debt and the development of chronic fatigue. Crew Endurance Management attempts to recognize this scientific fact and develop mitigating strategies that will work on a vessel using either a two-watch or a three-watch system.

Safe performance depends on both a person's biological clock and the amount and quality of sleep that person obtains each day. But, it doesn't end there.

[SLIDE 09]

As you can see, there are a number of other endurance risk factors that affect both a person's ability to maintain a safe level of performance and his or her long-term health. Workloads and schedules that prevent individuals from establishing daily routines that address these factors will lead to energy debt problems. Inevitably, daily energy debt results in performance degradation and can ultimately lead to human error and health concerns, such as gastrointestinal disorders, cardiovascular disease, and Type 2 diabetes.

[SLIDE 10]

So what can we do about this? Implement CEMS! The mechanism for CEMS support is being made available to the tugboat, towboat and barge industry through the Coast Guard - AWO Safety Partnership.

[SLIDE 11]

The Crew Endurance Management System is a non-regulatory solution that provides a practical way for management and crewmembers, as a team, to address crew endurance issues and concerns such as the biological clock and quantity and quality of sleep. Most important, CEMS is a field-tested system, developed by a leading expert in the field of Crew Endurance, who has worked closely with AWO member companies to fine-tune CEMS for application in the towing industry.

CEMS provides the opportunity for us to take a proactive stance to improve operational practices that improve crew endurance.

[SLIDE 12]

Let me tell you a little bit about how CEMS came to be.

By the late 1980s, much was known about the science of crew endurance and the roles of the human biological clock, stress, and diet. What was missing was an effective way to take the science from labs and books, and apply it in the "real world."

Dr. Carlos Comperatore, who was working with U.S. Army Tank Commands, Special Operational Forces, and Army Aviation units in the late 1980s and early 1990s, developed the concept that has come to be known as CEMS.

The Coast Guard, hoping to apply the promise of CEMS in both Coast Guard and commercial maritime operations, became interested in Dr. Comperatore's work, and hired him on at the Coast Guard R&D Center in Groton, Connecticut. It was that interest on the Coast Guard's part that launched the process that's led to our focus today . . .

[SLIDE 13]

... CEMS implementation in the commercial maritime towing industry.

[SLIDE 14]

CEMS is a three-phase process for implementing crew endurance management practices on a towing vessel. The first phase is Program Development -- developing a Crew Endurance Plan for a specific vessel.

This phase requires the formation of a Working Group with organizational representatives from all levels of the company -- management, unions, vessel masters, engineering supervisors, crewmembers.

It requires a coach to train the Working Group on the science and process of CEMS. (I'll explain more about coaches' training in a moment.)

Then, with facilitation provided by the coach, the Working Group assesses the current situation on the specific vessel, identifying endurance risk factors of concern.

Finally, the Working Group draws up a Crew Endurance Plan for the vessel that all members of the Working Group can agree upon. Members of the Working Group become responsible for championing the agreed-upon Crew Endurance Plan with their peers. They are also responsible for the plan's implementation and management over time.

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The second phase is Program Deployment, the implementation of the Crew Endurance Plan on the vessel.

In this phase, the coach, with the assistance of Working Group members from among the vessel crew, educates all crewmembers on the science and process of CEMS.

And, that is followed by implementation of the Crew Endurance Plan. Implementation requires enlisting the support of the entire crew, making the recommended system modifications based on the Plan, and then coaching the crew toward consistent implementation of those changes.

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The third and final phase is Program Assessment, monitoring and reviewing the implemented plan periodically. This phase is as important as the first two because it is ongoing attention that makes CEMS dynamic and robust. This last phase ensures that the implemented Crew Endurance Plan continues to be relevant and effective in an environment that changes over time -- for example, an aging vessel, or a new operational profile.

It's worth emphasizing that the three phases with their specific steps and procedures are there for a reason; the system won't work effectively if bits and pieces are extracted in a piecemeal fashion.

[SLIDE 15]

There are two critical preconditions for the successful implementation of CEMS within a towing company.

The FIRST precondition is the full commitment of management at all levels. I can't stress enough that without this commitment, which we refer to as "vertical alignment," CEMS cannot be successfully implemented.

[SLIDE 16]

The SECOND critical precondition is the identification and training of CEMS coaches. Coaches are company personnel who are tasked with the introduction and implementation of CEMS into your company at the vessel/crewmember level.

Because they work directly with crewmembers who may be apprehensive about CEMS, successful coaches must be fully trained champions of CEMS. They must believe in CEMS and the process of implementing it.

Coaches aren't born, they're trained. Coaches' training is a two-day workshop that teaches attendees a systematic approach to crew endurance. The workshop provides prospective coaches with in-depth knowledge of the science and the process of CEMS, and most importantly, teaches the attendee how to troubleshoot and solve CEMS implementation problems. Back at the company or on the vessel, CEMS coaches can help individual crewmembers maintain performance.

With management on board, coaches trained and reference materials in hand, your company is ready to implement CEMS.

[SLIDE 17]

But, are there tools available to support a company in implementing CEMS? Of course. The first is the Coast Guard-developed Crew Endurance Guide, which defines the various crew endurance risk factors and provides a step-by-step method to identify relevant risk factors within a specific operation and the controls necessary to mitigate the identified risk factors.

The guide is available now, and can be obtained as of June 2003 through the U.S. Coast Guard CEM Web site at <http://www.uscg.mil/hq/g-m/cems/CrewEndurance.index.htm>. Obtaining and reading the guide will supplement what I've said today and give you a much greater understanding of CEMS.

But, please keep this in mind. Reading of the guide by itself does not supplant the need for trained coaches. Having trained coaches is critical to successful implementation of CEMS in any company and is therefore a precursor to CEMS implementation. For now, coaches' training is available through the Coast Guard R&D Center in Groton, but the Coast Guard is also working to make coaches' training available through other sources, including industry training schools and other private institutions.

Other planned tools are also under development to assist companies in the implementation of CEMS.

[SLIDE 18]

So, how does CEMS work in the real world? What are some examples of what CEMS implementation has meant at specific companies, on specific vessels?

Here's an example of some of the CEMS-generated modifications that were made to a vessel that has been practicing crew endurance since May 2001, the M/V HUGH BLASKE of American Commercial Lines. To this day, the vessel continues to practice crew endurance/enhancement. In developing its Crew Endurance Plan, the Working Group identified light intrusion into crew sleeping quarters as an obstacle to obtaining quality sleep. Up to this point, they had tried curtains that were less than perfect in effectiveness, and pushing cardboard and other items up against the window gave their sleeping quarters a trashy feel. To resolve that problem, they came up with the idea of installing sliding wooden panels across their windows. This low-cost application resulted in a pitch-dark room when the room lights are turned off and the wooden panel slid shut.

[SLIDE 19]

A second example of changes to the M/V HUGH BLASKE are these noise reduction panels that effectively place sound baffles over ventilation louvers on cabin doors. They are crew-constructed and significantly reduce noise from adjacent passageways.

[SLIDE 20]

Here are other examples of modifications generated by CEMS, including strict adherence to nighttime adaptation requirements, improved lighting and dayroom environments, improved food choices, and improved air quality, temperature, and flow.

[SLIDE 21]

I hope I've told you enough to get you interested in exploring the implementation of CEMS in your company, because the benefits of CEMS to both the individual mariner and to your organization are far-reaching. By addressing human performance issues, the system-wide changes from implementing a Crew Endurance Management program not only increase a mariner's health, well-being, morale, and inclusion in decision-making processes, but also decrease the risk of a marine incident due to degraded alertness and performance.

[SLIDE 22]

CEMS has been extensively field tested, and as a result, has effectively packaged scientific knowledge about human operating limits into a usable, implementable process.

[SLIDE 23]

Remember these critical success factors: Vertical buy-in from both the top down and the bottom up is essential. The CEM Working Group needs to include members from all levels of the organization to demonstrate the value placed on all perspectives, and to enable the development of a Crew Endurance Plan that accounts for each organization's unique operations.

CEM coaches are also a critical component of the CEM System because they provide the support, feedback, and encouragement to an organization that may be dubious about change. Coaches are there to dispel the misinformation that's often generated inadvertently by individuals with preconceived notions about how the system works or about their own particular performance capacities.

[SLIDE 24]

The Coast Guard and AWO, through the Safety Partnership, are committed to working with the members of AWO to ensure that companies receive the necessary support to successfully implement CEMS at their companies. The Coast Guard's Human Element and Ship Design Division, in concert with the Research and Development Center, will continue to maintain oversight of the program, disseminate information and tools, and provide support to CEM coaches engaged in implementation efforts.

In closing, I hope what you've heard here today will motivate you to begin the process of implementing CEMS at your companies. The first and most important step in implementing the program successfully is the commitment of everyone involved.

I'll be happy to answer any questions you might have.

THE END