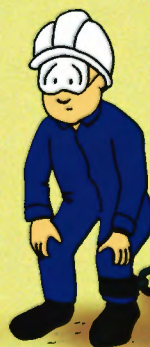
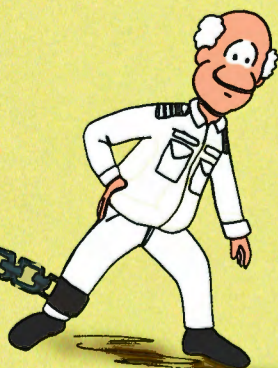


PREVENTING FATIGUE



FOREWORD AND ACKNOWLEDGEMENTS

It is hoped that everyone into whose hands this booklet, Preventing Fatigue, should fall will benefit from reading it! Being aware of fatigue, and overcoming its effects, are surely among the best ways of preventing accidents at sea.

For P & I clubs – and as is the case in other areas of human endeavor – prevention is better than cure! The American Club has long held this view as a central part of its mission. Its Board of Directors is deeply committed to loss prevention of which Preventing Fatigue is a new addition to a growing range of items of practical assistance to Members and seafarers alike. As Managers, we thank the Board - and in particular Mr. James P. Sweeney of Penn Maritime Inc., who chairs the Club's Safety & Environmental Protection Committee - for their unstinting support in this important sphere of the Club's activity.

This activity gained a new impetus when Dr. Bill Moore joined us just over a year ago. His expertise, together with his energy in developing new initiatives for the Club, deserve special acknowledgement. It has been gratifying to see how much more widely the Club's influence has been growing in this area since Bill became a member of our team. Many thanks are also due to John Steventon without the commitment of whose artistic talents this important publication would never have had such a striking visual impact.

It is a widely held misconception of the modern era that complexity equals sophistication - and effectiveness. By contrast, Preventing Fatigue, with its easy-to-read format made memorable by an undercurrent of humor, imparts a serious message which everyone can understand and absorb. Most importantly, the message is one we hope which will have a genuinely positive bearing on reducing the effects of fatigue as a root cause of human error in maritime accidents and thus have a measurable effect in reducing accidents over the years ahead!

Joseph E. M. Hughes
Chairman & CEO
Shipowners Claims Bureau, Inc.
Managers for The American Club



Preface

The safety and well being of seafarers is a paramount concern of all who are engaged in the maritime industry. For it is the seafarer who represents the ultimate point of practical responsibility for insuring safety and environmental protection at sea. And perhaps more than anything else, it is fatigue which affects the seafarer's ability to maintain that level of alertness essential to the avoidance of the human error that leads – as so many studies indicate – to the majority of marine casualties.

The American Club believes that it is imperative to provide seafarers with a safe working environment and provide loss prevention information to assist them in identifying, assessing and preventing fatigue while working aboard ship.

As a result, the Club has produced this booklet, Preventing Fatigue, as an easy-to-read and user-friendly publication for seafarers as a means of familiarizing themselves with the risks of fatigue. Preventing Fatigue is derived from the observations contained in the International Maritime Organization's publication, Guidelines on Fatigue. The Club urges reference to the IMO Guidelines for detailed guidance on how to identify and prevent fatigue and consequently implement strategies aimed at reducing the incidence and severity of seafarer fatigue.

For additional information on the American Club's loss prevention initiatives, please refer to its website at www.american-club.com.

*William H. Moore, Dr. Eng.
Shipowners Claims Bureau, Inc., Manager
American Steamship Owners Mutual
Protection & Indemnity Association, Inc.*

PREVENTING FATIGUE

THE HUMAN ELEMENT



HUMAN ERROR CAUSED BY FATIGUE POSES A RISK TO LIFE, PROPERTY, AND TO THE ENVIRONMENT.

AND FATIGUE AFFECTS EVERYONE, REGARDLESS OF SKILL, KNOWLEDGE, OR TRAINING.

THIS MEANS YOU!



HMMM. FATIGUE IS ESPECIALLY IMPORTANT TO SEAFARERS, WHERE-



AAAAA!

**BEEP!
BEEP!**



BEING ALERT IS CRITICAL!





WHAT IS FATIGUE?

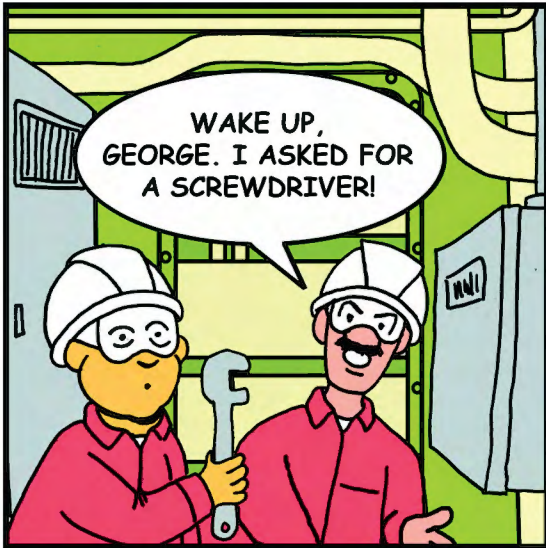
THIS IS
GEORGE.

HE'S BEEN AT
SEA FOR SIX
MONTHS NOW.

HE'S CROSSED
FIVE TIME ZONES,
HAS RECENTLY
MOVED TO NIGHT
SHIFT, AND HE
CAN'T REMEMBER
IF HE TURNED HIS
GAS FURNACE OFF
WHEN HE LEFT
HOME.

GEORGE IS
FATIGUED.

GEORGE IS TIRED AND HE CAN'T THINK STRAIGHT.
HE HAS A TOUGH TIME MAKING DECISIONS.
HE'S NOT AS STRONG OR AS FAST AS HE SHOULD BE
OR AS COORDINATED...



AND HIS REACTION TIME IS WAY OFF.

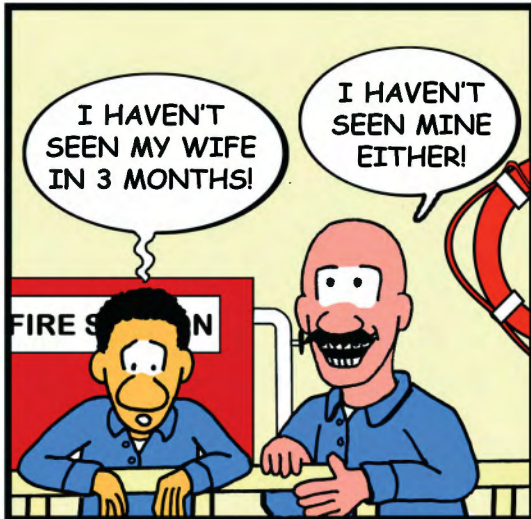


UNIQUE ASPECTS OF SEAFARING THAT CAN LEAD TO FATIGUE

SEAFARERS DEAL WITH WEATHER OF ALL EXTREMES



LONG TOURS OF DUTY



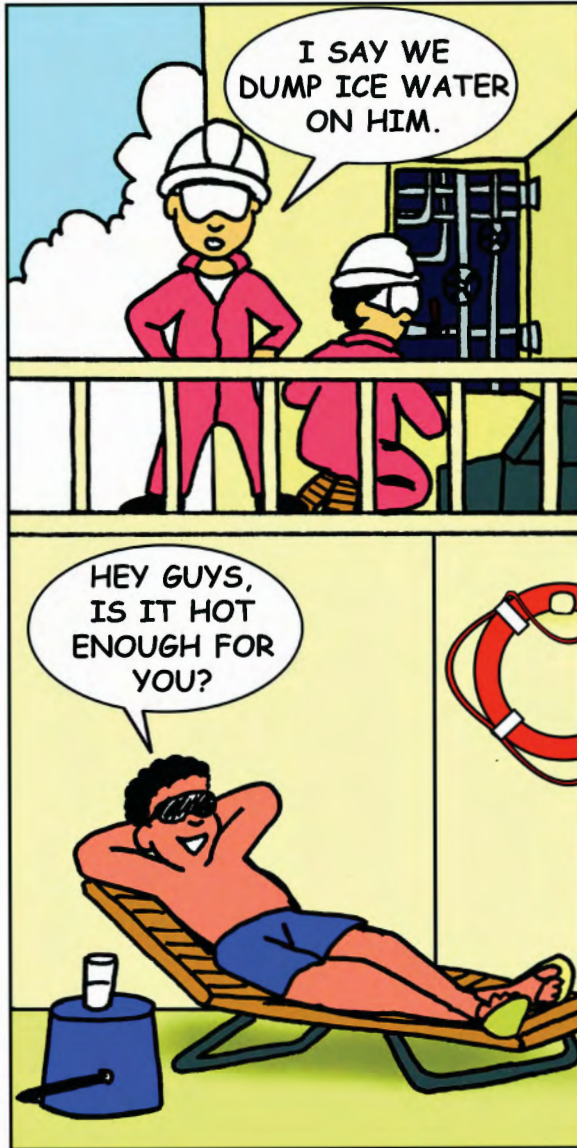
AND NOISE AND VIBRATION



BUT THESE ARE ONLY A FEW ASPECTS...

MORE ASPECTS OF SEAFARING THAT CAN LEAD TO FATIGUE

THERE IS OFTEN NO CLEAR
SEPARATION BETWEEN
WORK AND RECREATION



AND SOMETIMES TENSIONS
CAN ARISE BETWEEN CREW
MEMBERS.



ANY OF THESE FACTORS CAN
LEAD TO STRESS, POOR SLEEP,
AND FATIGUE.



AND THERE
ARE PLENTY
OF OTHERS!

THE 3 MOST COMMON FACTORS THAT CAUSE FATIGUE.

- ★ LACK OF SLEEP
- ★ POOR QUALITY OF REST
- ★ STRESS AND EXCESSIVE WORKLOAD



AS PREVENTING FATIGUE SHOWS, THERE ARE MANY FACTORS THAT CAN CAUSE SLEEP DISRUPTION.

TOGETHER THEY CAN BE OVERWHELMING, AND LEAD TO

PERSONAL PROBLEMS
 FEAR
 VIBRATION
 WORK LOAD
 POOR DIET

SHIFT WORK
 NOISE
 MEDICATIONS
 SHIP MOVEMENT

FITNESS
 DRILLS
 COFFEE
 ALCOHOL
 AGE

CRAMPED QUARTERS
 STRESS
 WEATHER
 JET LAG



HOWEVER THERE ARE FACTORS THAT WE CAN CONTROL SUCH AS WHAT WE EAT AND DRINK TO KEEP FIT. HEAVY FOODS AND CAFFEINE SHOULD BE TAKEN IN MODERATION.

MEDICATION SHOULD ONLY BE TAKEN AS PRESCRIBED.

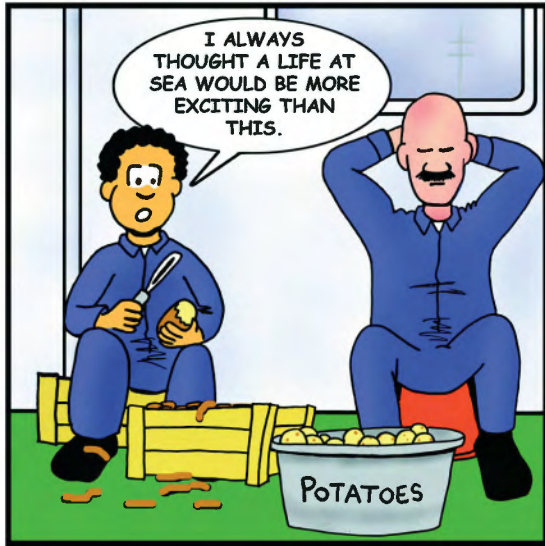


SO BEFORE FATIGUE BECOMES A PROBLEM, DO WHAT YOU CAN TO CONTROL IT.

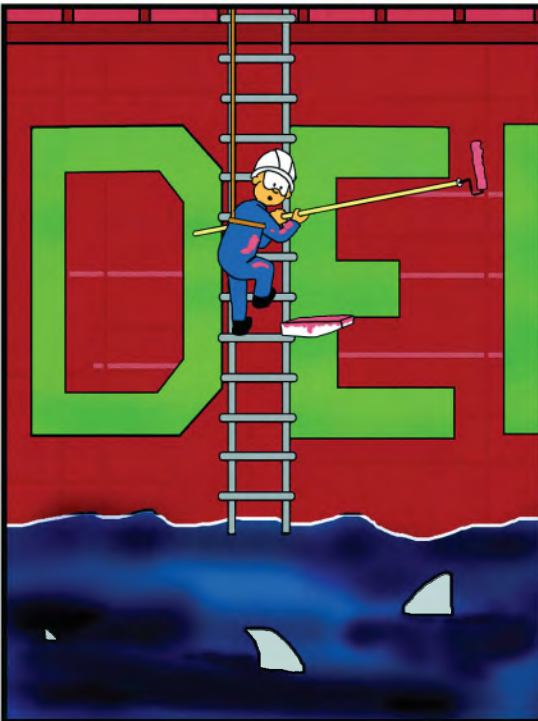


CREW SPECIFIC FACTORS

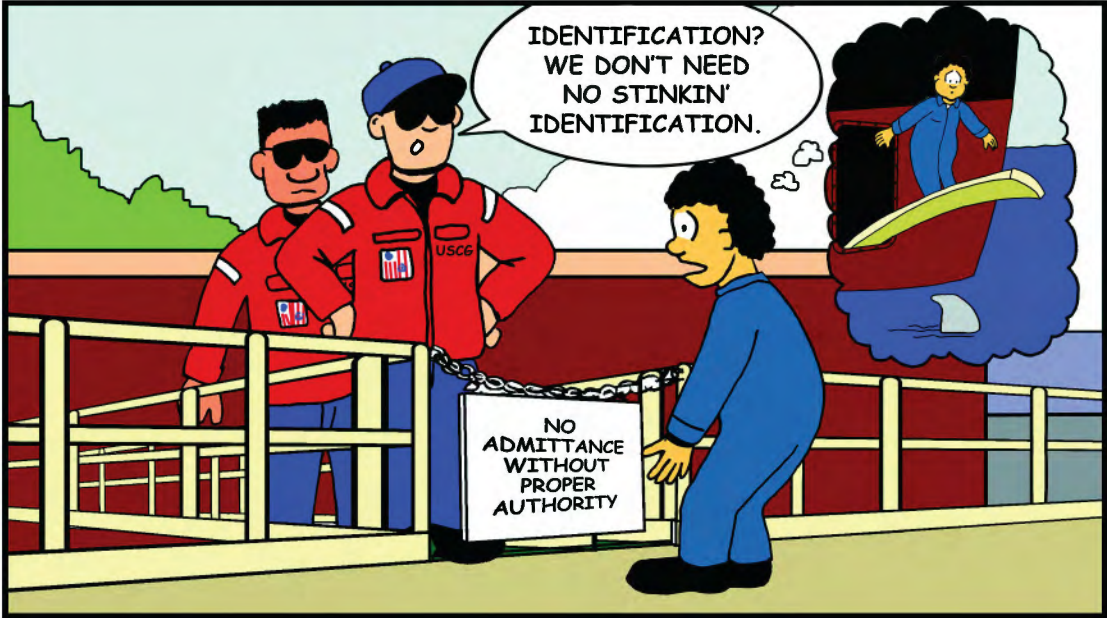
THERE ARE PHYSICAL, EMOTIONAL, AND PSYCHOLOGICAL FACTORS THAT CREATE STRESS OR DISCOMFORT AND LEAD TO FATIGUE ONBOARD SHIP.



THESE INCLUDE THE FOLLOWING; MONOTONY AND BOREDOM, STRESS AND FEAR, WHAT PEOPLE EAT OR DRINK, AND ESPECIALLY PERSONAL RELATIONSHIPS.



STRESS, FEAR, AND OTHER WORRIES CAN DISRUPT TODAY'S SEAFARERS BOTH PHYSICALLY AND MENTALLY. THIS CAN LEAD TO SLEEPING DISORDERS AND TO FATIGUE.

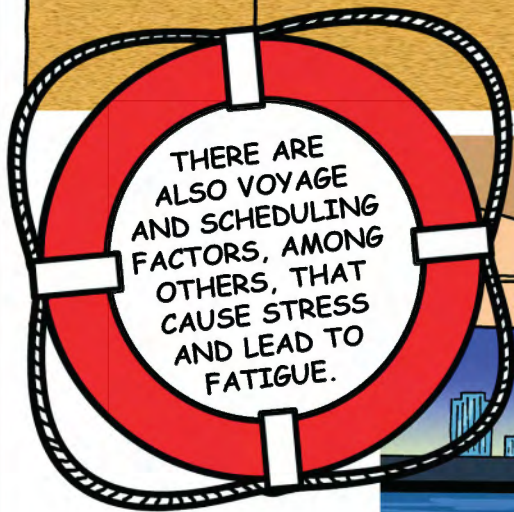


STRESS CAN BE CREATED BY SEAFARERS BEING PUT INTO POSITIONS BEYOND THEIR SKILL LEVEL OR TRAINING.



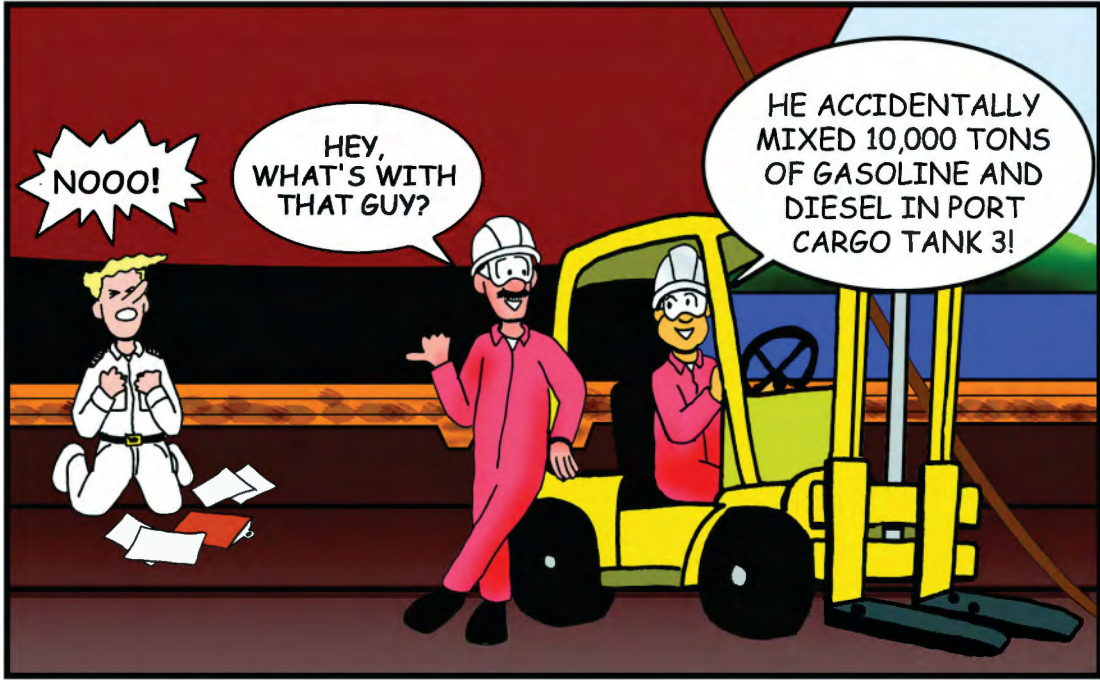
MANAGEMENT HAS ITS OWN SET OF PROBLEMS

THERE ARE RULES AND REGULATIONS, PAPERWORK, EMAILS, AND EVEN MORE PAPERWORK.



OFFICER SPECIFIC FACTORS

FATIGUE CAN AFFECT A PERSON'S MEMORY AND THEIR ABILITY TO CONCENTRATE. THIS CAN CAUSE PROBLEMS WHEN JOBS ARE DONE OUT OF ORDER, OR WHEN STEPS IN A PROCEDURE ARE FORGOTTEN.



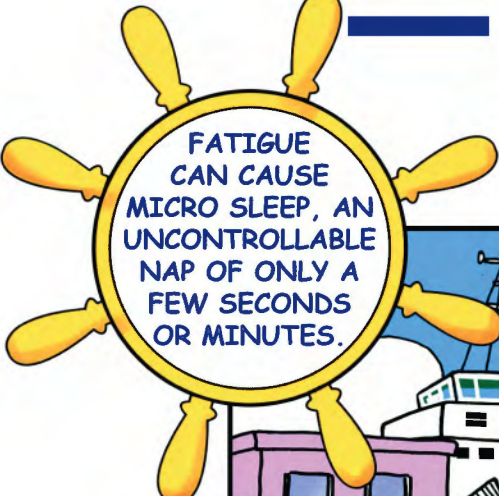
FATIGUE ALSO RESULTS IN SLOW RESPONSE TIMES, AN INCREASE IN RISK TAKING, AND CAN LEAD TO A 'DON'T CARE' ATTITUDE.



FATIGUE CAN MAKE AN OFFICER IRRITABLE, FORGETFUL, AND OFTEN UNABLE TO PERFORM COMPLEX TASKS.

FATIGUE AND THE PILOT

PILOT FATIGUE CAN POTENTIALLY LEAD TO CATASTROPHE, AND SO MUST BE A HIGH PRIORITY.



FATIGUE CAN CAUSE MICRO SLEEP, AN UNCONTROLLABLE NAP OF ONLY A FEW SECONDS OR MINUTES.



I'M AWAKE NOW!!

A FATIGUED PILOT MAY NOT EVEN BE AWARE OF AN INCIDENT OF MICRO SLEEP!



CRUNCH!

IT IS UP TO EVERYONE, OWNERS, MASTERS, AND PILOTS TO MONITOR PILOT FATIGUE, AND TO FIND WAYS TO REDUCE IT.



AS AN ANTI-FATIGUE MEASURE, THEY'VE REPLACED OUR PILOT CHAIR WITH AN EXERCISE WHEEL.

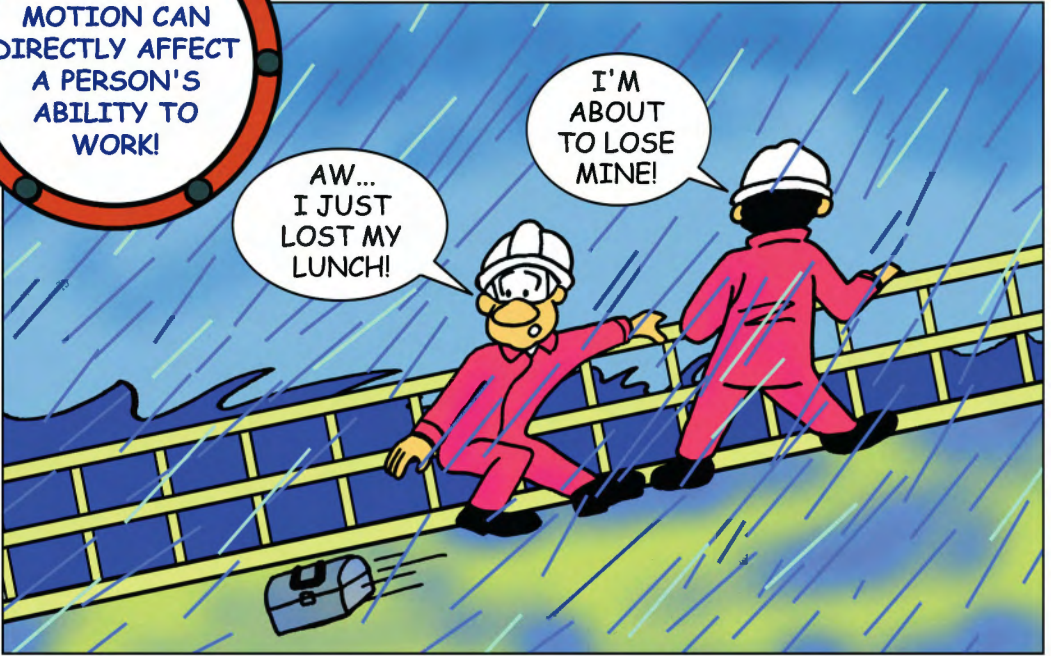
ENVIRONMENTAL FACTORS

JUST TRYING TO KEEP YOUR BALANCE IN ROUGH SEAS CAUSES YOU TO EXPEND EXTRA ENERGY.

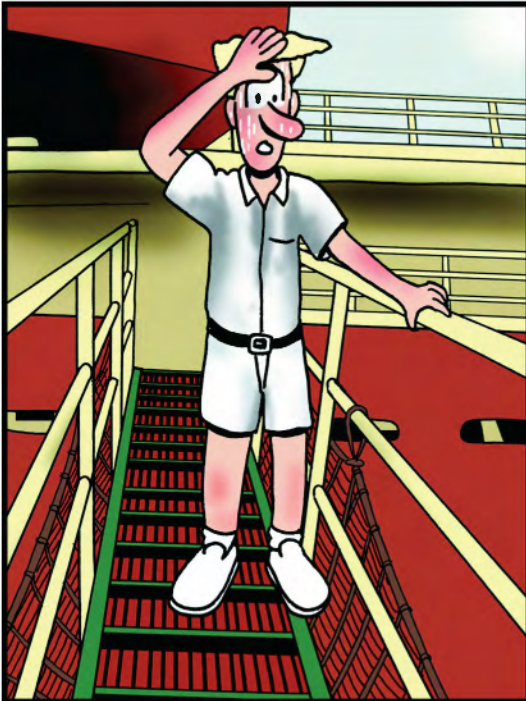
SHIP MOTION CAN DIRECTLY AFFECT A PERSON'S ABILITY TO WORK!

AW... I JUST LOST MY LUNCH!

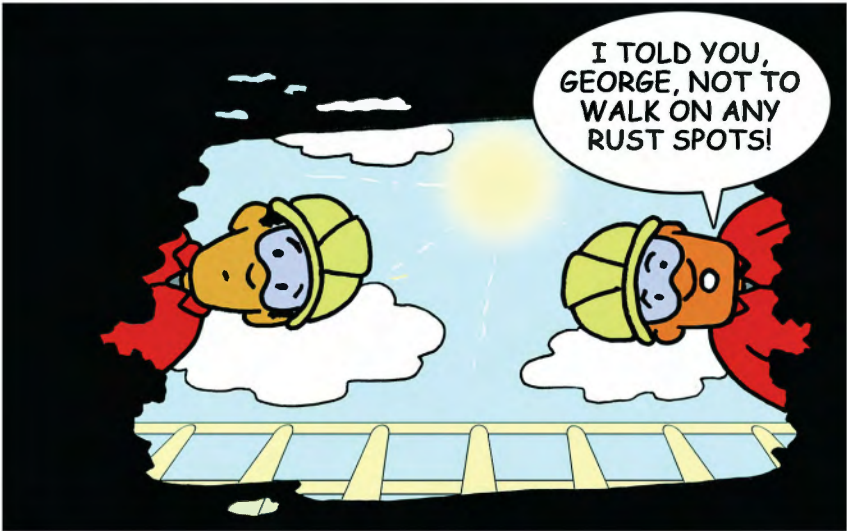
I'M ABOUT TO LOSE MINE!



EXTREME WEATHER CONDITIONS ALSO CAUSE PHYSICAL DISCOMFORT, WHICH OFTEN LEADS TO SLEEPING PROBLEMS.



THE SHIP ITSELF IS A FACTOR THAT CAN CAUSE OR AFFECT FATIGUE.



TO BE HONEST, SOME SHIPS ARE GETTING OLD,



WHILE OTHERS ARE ACTUALLY ANCIENT!





THESE BUNKS
AREN'T HALF BAD,
ARE THEY, TINY?

SHIP DESIGN CAN
ALSO CONTRIBUTE
TO FATIGUE.

THE SHIP IS THE
SEAFARER'S HOME
AND WORKPLACE.
NOISE, EASE OF
MOTION AND
ESPECIALLY COMFORT
CAN CAUSE
CONDITIONS THAT
LEAD TO FATIGUE.



STRETCH REALLY
COMES IN HANDY
IN THESE HARD TO
REACH PLACES.

TO UNDERSTAND FATIGUE, WE MUST UNDERSTAND SLEEP.



TO BE
ALERT, WE
NEED GOOD
SLEEP.

AND GOOD SLEEP MEANS LONG, DEEP
SLEEP WITHOUT INTERRUPTION.



WE NEED 7 TO 8
HOURS OF SLEEP
PER DAY, IN A
ROW...



WHICH MEANS
THAT SIX 1 HOUR
NAPS DO NOT EQUAL
ONE 6 HOUR SLEEP.

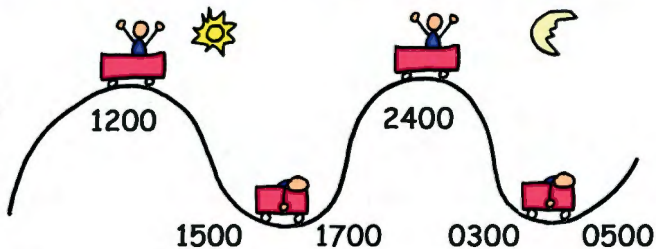


ALSO, OUR SLEEP MUST BE IN SYNC
WITH OUR BIOLOGICAL CLOCK.



THE BIOLOGICAL CLOCK

IT'S YOUR BODY'S NATURAL CLOCK, BUT IT ACTS LIKE A 24 HOUR ROLLER-COASTER!



IT'S A DIFFERENT RIDE FOR EVERYONE, BUT WE ALL HAVE **TWO** LOW POINTS DURING WHICH EVEN A WELL-RESTED PERSON CAN FEEL TIRED.

FOR SEAFARERS

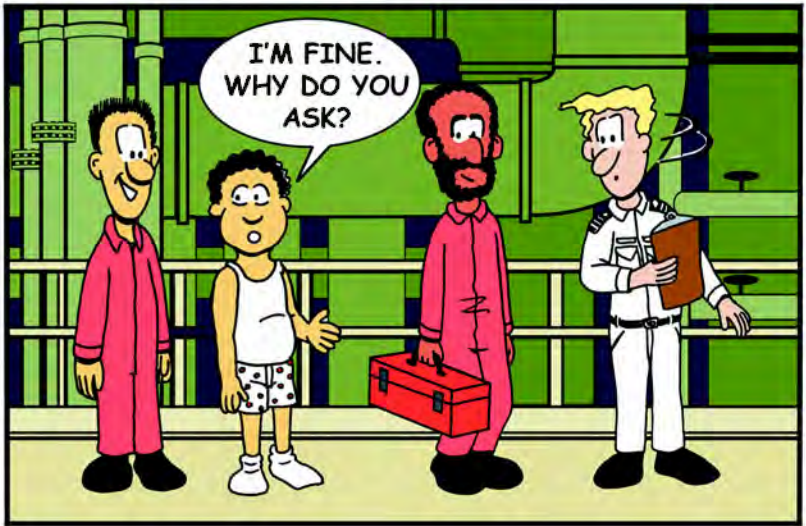
FACTORS LIKE SHIFT WORK AND TIME ZONES CAN CAUSE CONFLICTS WITH THE BIOLOGICAL CLOCK.



HOWEVER,



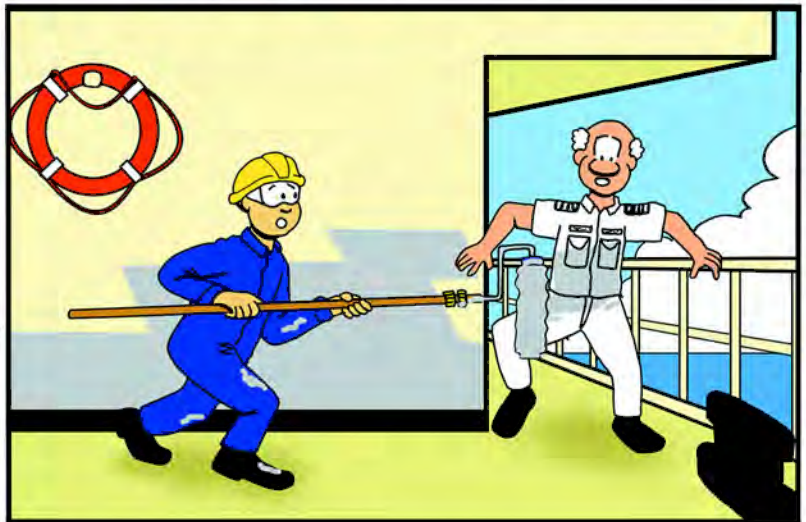
PEOPLE ARE OFTEN POOR JUDGES OF THEIR OWN FATIGUE.



FATIGUED PEOPLE TEND TO BE FORGETFUL, AND OFTEN FORGET STEPS IN A SEQUENCE.



FATIGUE CAN LEAD TO ALL KINDS OF ERRORS DUE TO SLOW RESPONSE TIME, POOR HAND-EYE COORDINATION, AND OTHER MENTAL AND PHYSICAL IMPAIRMENTS.



FATIGUE
IMPAIRS
EVERY ASPECT
OF HUMAN
PERFORMANCE.

IT WEIGHS
US DOWN,
DRAINS OUR
ENERGY, AND
MAKES IT
VERY DIFFICULT
FOR US TO
FUNCTION AT
OUR PEAK.

F
A
T
I
G
U
E



HOW TO RECOGNIZE FATIGUE IN YOURSELF AND OTHERS.

SUDDEN SWEATING.
BAGS UNDER EYES.

IRRITABILITY.
MOOD SWINGS.

UH...

@#\$\$%!!

SHORT
ATTENTION
SPAN.

STAIN ON
UNIFORM.

SO WHAT IF
THERE'S ICE THERE?
IT'S A GREAT
SHORTCUT!

CASUAL ATTITUDE.
WILLING TO TAKE
RISKS.

SLOW
REACTION
TIME.

YOU CAN HAVE ANY COMBINATION
OF THESE SYMPTOMS WHEN
FATIGUED.

APPEARS
DISTRACTED.

BUMPED
NOSE BY
WALKING
INTO A
CLOSED
DOOR.

HEAVINESS IN
ARMS. CLUMSY.
DROPS THINGS
OFTEN.

UPSET
STOMACH.

HASN'T
NOTICED
THAT HIS
SHOES ARE
ON THE
WRONG
FEET!

ZZZZZZZZ

ASLEEP ON
THE JOB.

PROTECTING YOURSELF FROM FATIGUE AND MAINTAINING PERFORMANCE BY DEVELOPING GOOD SLEEPING HABITS LIKE GEORGE AND RAGNAR.

GEORGE KNOWS THAT REGULAR EXERCISE CAN HELP HIM GET A GOOD NIGHT'S SLEEP.

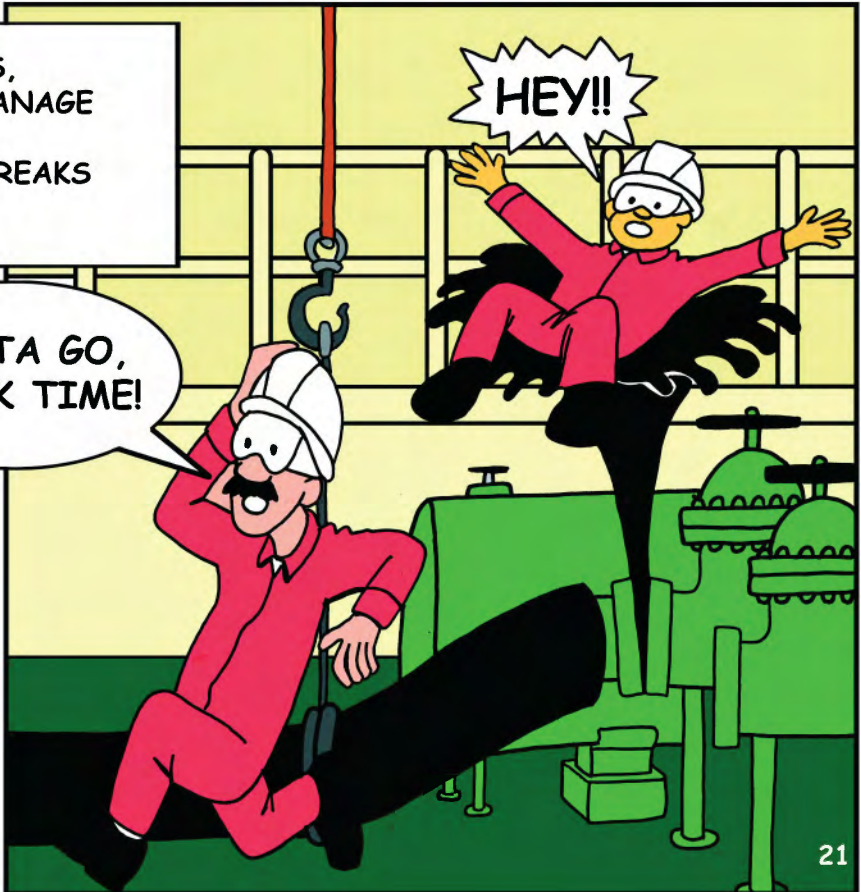
UNFORTUNATELY, RAGNAR DOESN'T CARE FOR EXERCISE.



RAGNAR DOES, HOWEVER, MANAGE TO TAKE HIS SCHEDULED BREAKS ON TIME.

GOTTA GO,
BREAK TIME!

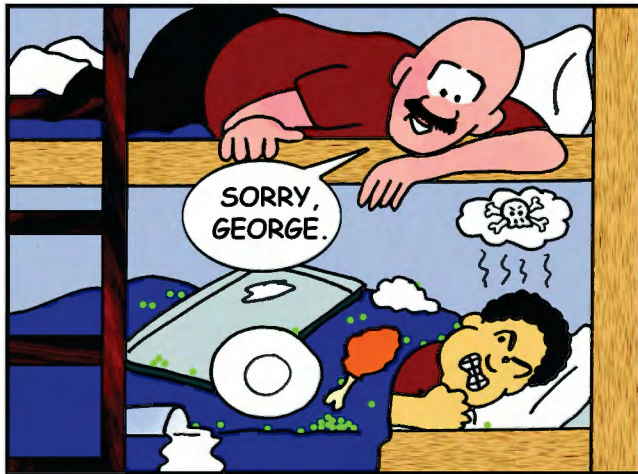
HEY!!



GEORGE KNOWS THAT HIS BODY NEEDS CONTINUOUS SLEEP IN A DARK QUIET ROOM. SO DOES RAGNAR.



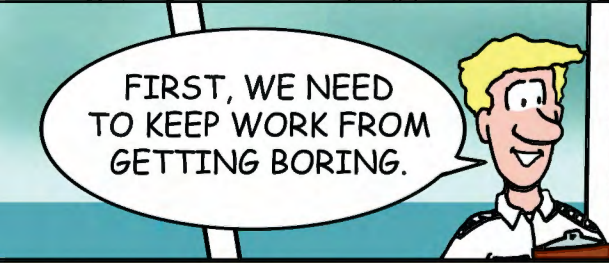
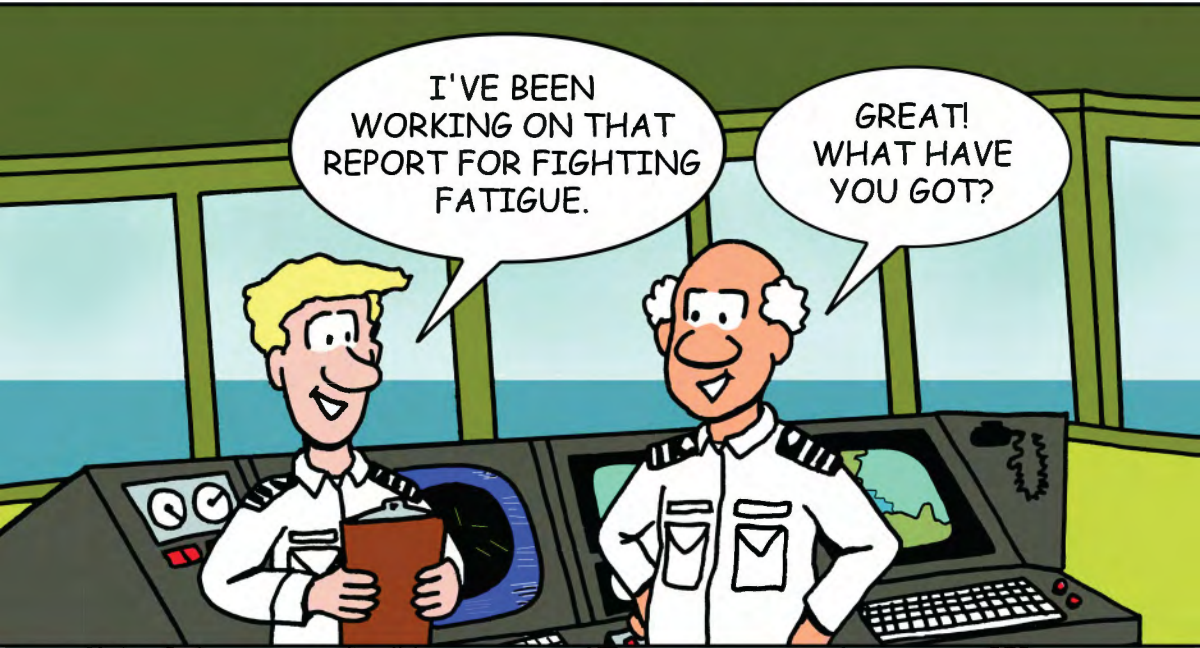
BOTH GEORGE AND RAGNAR HAVE A SNACK BEFORE BEDTIME, TO AVOID WAKING UP EARLY AND HUNGRY.



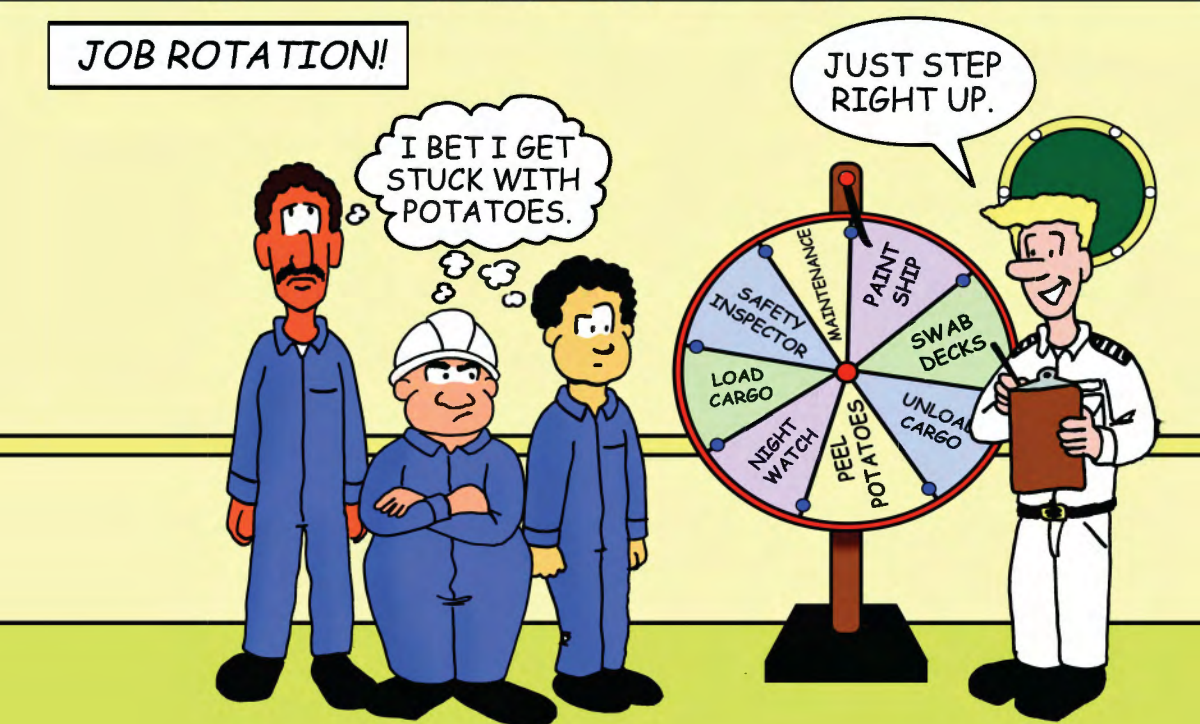
IT'S TOO BAD THAT RAGNAR WASN'T SMART ENOUGH TO SNACK LIGHTLY LIKE GEORGE DID!

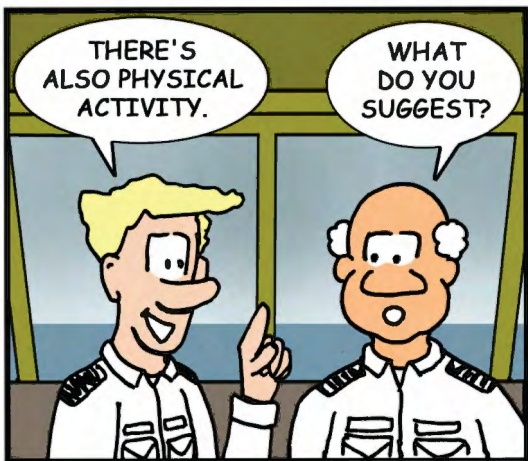
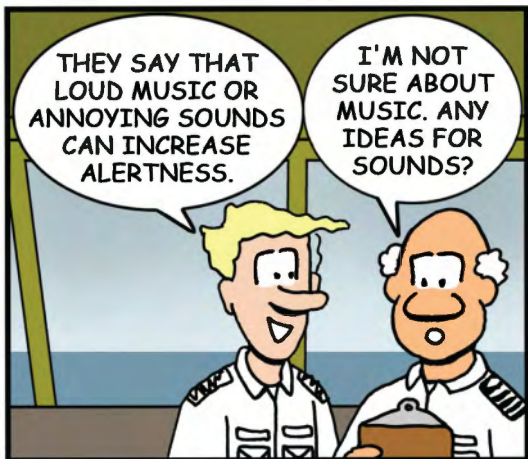


MINIMIZING THE EFFECTS OF FATIGUE



JOB ROTATION!





PREVENTING FATIGUE



**AMERICAN STEAMSHIP OWNERS MUTUAL
PROTECTION & INDEMNITY ASSOCIATION, INC.**

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