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Cracking the code - ISM Code, the key issues
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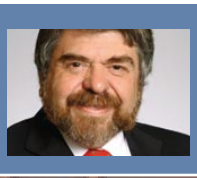

Exploring Human Factors
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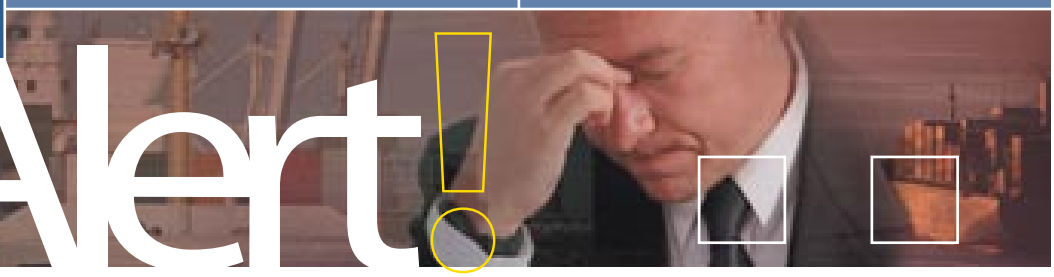
The International Maritime Human Element Bulletin

Issue No. 2 January 2004



Paperwork ..... what paperwork?

The International Safety Management Code (ISM Code) represents the cornerstone of the International Maritime Organization's approach towards a safety culture, with the emphasis on the human element. In this edition of *Alert!* we examine the implications of the ISM Code, which came fully into effect in July 2002. The news is both bad and good - Port State Control inspections reveal that some ship personnel are not applying the system to the operation of the ship, which in human element terms means that more care needs to be placed on the human understanding of the system. Perceptions of the ISM Code vary from the bluntly negative to the very positive, but it is clear that successful implementation requires a commitment on the part of key stake-holders - mariners, operators, owners, classification societies and flag state authorities - together with adequate preparation and training.

Increasing paperwork, especially the amount of electronic correspondence that the master has to contend with, is giving cause for concern - it can sidetrack him from his primary purpose of working the ship. Checklists may provide useful guides to procedures but is the mariner becoming a slave to procedure rather than using his basic knowledge, based on education and training and a degree of common sense?

The main feature in this edition explores *Human Factors* - a term which is often misinterpreted. In this feature we examine the two principal domains that should be considered in the design and operation of any ship or its systems - *Human Factors* and *Human Resources*, and we examine the various factors that can influence the interaction between a human and any system aboard ship.

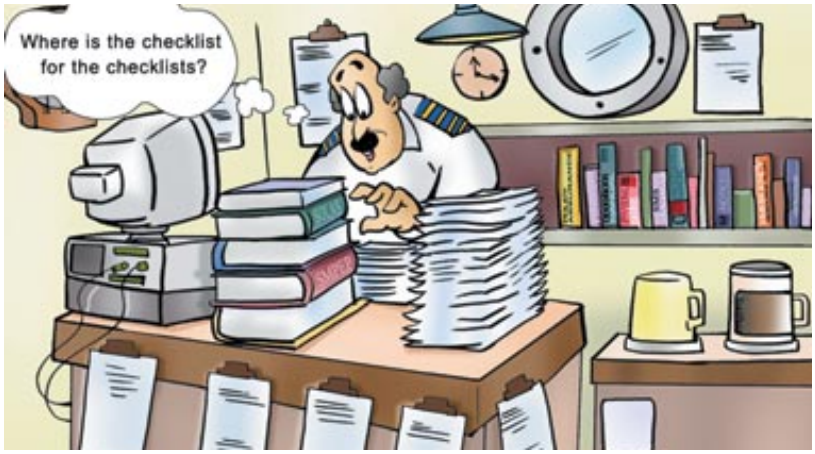
Comments on any of the articles or other human element issues are always welcome to: ***editor@he-alert.org***

'Too much paperwork' is the cry of many mariners today. This has been brought about, seemingly, by the requirements of the ISM Code, Port State Inspections, vetting inspections and port entry and ship/shore safety checks. In human element terms, increasing paperwork can sidetrack the mariner (especially the master and the chief engineer) from his primary purpose of working the ship. *'Routine clerical or administrative work'* is one dictionary's definition, but it would seem that in the maritime world it is becoming far more than simply *routine.*

Electronic paperwork (especially e-mail correspondence) seems to have increased the burden on the ship's master. While onboard a 15000gt LPG tanker (managed by a very reputable company), the Master commented to me that he spends on average 3 to 4 hours a day on sending and receiving information by e-mail; he adds 'one day I spent 8 hours dealing with e-mails - responding to a terminal message took one hour .....it is taking up my time; instead of doing Captain jobs and watching for the navigation, I am having to concentrate on the messages.'

He adds that on the tankers there are plenty of inspections, where the inspectors are looking for checklists. On one major inspection, he was asked why he did not have a specific checklist for the changeover of the bridge watch, despite having his own company procedures printed out on the bridge. On his ship there are some 22 checklists for assorted bridge, deck and cargo operations. He adds: 'Very soon, you will have to have a checklist for going to the toilet!' But this begs the question whether there is now a need for a checklist to check the checklists.

On a more positive note, he suggests that the use of software programs for activities such as routine administration, recording ISM non-conformances, the management of spare parts and routine planned maintenance, can cut down the amount of paperwork, but only if it is used wisely and if proper IT training is provided.



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Alert!

The International Maritime Human Element Bulletin

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A Classification Society's View of Human Element Issues

James C. Card
Senior Vice President, Technology ABS

Since the 18th century, Classification Societies have served the public interest, as well as the needs of clients, by promoting the security of life, property, and the natural environment. This has been accomplished primarily through the development and verification of standards for the design, construction and operational maintenance of marine-related facilities.

About ten years ago, ABS recognized that to better fulfill its role, the scope of classification would need to be broadened to address the "human element". The STCW Convention and the ISM Code established a baseline approach to such concerns, yet ABS recognized that further efforts were needed if significant gains in safety were to be realized.

ABS' efforts began with research and development activities related to safety assessment, human factors and risk. Since design is a traditional area of concern for Classification, it was logical to begin by providing ergonomic design guidance. In 1998, the *"ABS Guidance Notes for the Application of Ergonomics to Marine Systems"* were published. This effort was followed by documents addressing Crew Habitability, Passenger Comfort, and the Ergonomics of Navigation Bridge Design.

ABS is now moving beyond simple ergonomic design issues, and is looking into areas such as human fatigue, situation awareness, management and organizational factors, and root cause analysis for incidents. ABS is committed to discovering new means to enhance human and organizational performance - means that will reduce the number of casualties and incidents resulting from human error.

Free downloads of the various ABS Guides can be obtained at:
http://ww2.eagle.org/en/rules-and-resources/rules-and-guides.html

Some thoughts from the sharp end .....

I am currently serving as a chief engineer on offshore support vessels. We have recently completed a 3-year new building programme during which time we have delivered 10 assorted new vessels for the offshore industry. I totally agree with the view that Naval Architects should be sent to sea to gain experience before being allowed to design vessels.

We have consulted widely within our fleet, regarding console layouts, the position of equipment, and the man-machine interface. However, whilst the best solutions have always been sought, inevitably a compromise has been reached due to personal preference, physical constraints, and not least, cost.

A ship is unique because not only is it a method of transport, but also because it is a place of work, and a *home!* I often feel that this last item appears at the end of the list of priorities in the planning and design process.

Changes in cargo handling methods have reduced time in port to a minimum, and reduced manning has increased the workload on individuals. There is hardly any break to the routine of ship life which does not allow quality time to relax and rest and a chance to catch up on outstanding work. Shortened periods in harbour increase pressure to complete necessary maintenance on the main propulsion plant. The use of electronics is making it more difficult for ships staff to effect repairs without a manufacturer's representative and his laptop computer. This reduces the sense of job satisfaction that for many engineers is what the work is all about.

And, finally, there is increased pressure from all the extra paper that is now required, and from surveys that seem to be taking place every time a vessel is in port. Sometimes it appears that completing the paperwork correctly is more important than ensuring the vessel is in a safe and efficient condition. 'Quality of life, must be an important human factor!'

Nick Warren, FIMarEST

A fuller version of Mr Warren's article can be downloaded from the website at www.he-alert.org [ref: HE00205]

The relevance of the ISM Code and its impact on shipping practices

Cracking the Code

Dr Phil Anderson

The Nautical Institute's latest publication ***Cracking the Code*** *is the result of some 2 year's research into the effectiveness of the International Safety Management Code (ISM Code). The ISM Code represents the cornerstone of the International Maritime Organization's approach towards a safety culture, with the emphasis on the human element. The book's author Dr Phil Anderson reflects here on some key issues, which have human element connotations.*

A very significant section of our industry still appears to be struggling to implement the ISM Code because of an inadequately functioning Safety Management System (SMS). There are, however, many examples of SMSs which can and do work. The reason why there is such a diverse range of experiences of ISM implementation is directly attributable to the way in which the individual SMS was designed and put into practice. Some of the common negative factors expressed by individuals involved in its implementation are:

- Too much paperwork
- Voluminous procedures manuals
- Irrelevant procedures
- Bought - off-the-shelf systems
- No feeling of involvement in the system
- Ticking boxes in checklists (without actually carrying out the required task)
- Not enough people/time to undertake all the extra work involved
- Inadequately trained/motivated people
- No support from the Company
- No perceived benefit compared with the input required
- ISM is just a paperwork exercise

It is not the fault of those people who expressed these negative attitudes that they feel the way they do. They are the unfortunate recipients of a concept which has been basically dumped on them with little or no preparation, training or involvement. The SMS can only work if those who are involved in its implementation actually want it to work. This is at the heart of the very nature of management systems and is what differentiates them from prescriptive rules and regulations.

It is worth comparing some of the common factors which emerge from those Companies who appear to be operating very successful SMSs, with the above rather negative list:

- Leadership and commitment from the very top of the organisation.
- Paperwork reduced to manageable levels - including procedures manuals, checklists, reports etc.
- A sense of ownership/empowerment by those actually involved in the implementation process of the SMS - i.e. the personnel on board the ship.
- Continuity of employment of personnel both ashore and on board ship.
- Two way communication between ship and office - with mutual respect.
- Awareness of the importance to the individual and to the Company of managing safety.

It is out of these various attributes that a Company Culture, and in turn a Safety Culture, flowed as a natural consequence. When these various components are combined they are sufficient to produce a working environment in which people take responsibility for their own safety and contribute towards the safety of others and the Company as a whole. As a natural consequence of that shift in attitudes and values, accidents, incidents and consequently insurance claims, all start reducing. And, there is a much more efficient use of time which allows genuine efficiencies to be made with the consequence that less money is draining out of the Company.

Further information on this project can be found at www.ismcode.net. See also www.he-alert.org [ref: HE00135]

Cracking the Code can be purchased through the Nautical Institute
www.nautinst.org/en/shop/index.cfm

Improving the Application of the Collision Regulations

The Nautical Institute has conducted an international survey amongst sea staff, training staff and examiners to discover what are the norms, problems, and influences which affect decisions taken on the bridge. This survey is now complete, with 452 questionnaires having been returned.

The questionnaire asked for opinions in respect of compliance with, and understanding of, the Collision Regulations (Colregs). A significant number claimed that the actions of others are often contrary to the Colregs, and many offered disregard and ignorance as the most common causes.

Some worrying statistics have come out of the analysis of distractions. Perhaps not surprisingly, GMDSS alarms create the greatest number of distractions, but these are followed by internal interruptions and legitimate radio traffic. The issue here is to assess when normal distractions may become critical and how to manage them.

When suggesting means to improve Colregs discipline, the key issues were:

- improved education and training
- additional experience
- better supervision
- more rigorous exams

Exploring Human Factors

Person

SKILL
Competence
Previous training
Experience
Currency
Leadership

CULTURAL DIFFERENCES
Religion, national tradition, dress, language

MOTIVATION
Work environment
Temperature, humidity, air quality, lighting, noise, vibration, cleanliness
Working hours
Continuous operations, watchkeeping
Habitability
Adequate tools & equipment
Manning levels
Organization structure
Authority, responsibility, communication
Actions by others
Reward
Recognition
Benefits
Job description
Instructions
Procedures
Continuation Training

KNOWLEDGE
Education & training

PHYSICAL STATE
Personal health & hygiene, fitness, balanced diet

PHYSICAL CAPABILITY
Strength, stamina, stress, fatigue, pain/discomfort, hunger, thirst, temperature extremes, vibration, movement constriction, lack of physical exercise, disruption of circadian rhythm

PSYCHOLOGICAL STATE
Task speed, task load, threat of failure/loss of job, monotonous, degrading or meaningless work, long uneventful vigilance periods, conflicts of motives about job performance, reinforcement absent or negative, sensory deprivation, distractions (noise, glare, movement, flicker, colour), inconsistent cues

PSYCHOLOGICAL CAPABILITY
Perception, motor requirements (speed, strength precision), control-display relationships, anticipatory requirements, interpretation, decision-making, information load, narrowness of task, frequency & repetitiveness, task criticality, long/short-term memory; calculation requirements, feedback (knowledge of results), dynamic v step-by-step results, team structure & communication, man-machine interface

Job (task, environment and equipment

SKILL
Competence
Previous training
Experience
Currency
Leadership

CULTURAL DIFFERENCES
Religion, national tradition, dress, language

MOTIVATION
Work environment
Temperature, humidity, air quality, lighting, noise, vibration, cleanliness
Working hours
Continuous operations, watchkeeping
Habitability
Adequate tools & equipment
Manning levels
Organization structure
Authority, responsibility, communication
Actions by others
Reward
Recognition
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Photo credits: Bridge - ABS. Others - jalens - joachim affeldt

Human Factors, or *The Human Factor*, are terms which are often misinterpreted and are used as a covers for the *Human Element* or even *Human Error*. A simple definition of *Human Factors* is: ***the body of scientific knowledge about people and how they interact with their environment, especially when working.*** Applying human factors to the design and operation of a ship or its systems means taking account of human capabilities, skills, limitations and needs. *Human Factors* should not be confused with the term *Human Resources* which is a closely related activity that addresses the supply of suitably qualified and experienced staff.

When considering the operation or design of any ship and its systems both of these domains should be considered - *Human Resources* for the selection and preparation of staff able to do the required work and *Human Factors* to account for the use of people as a component of the system. Both domains contain a number of sub-domains:

Human Factors (Fitting the job to the person):

- **Human Factors Engineering** - The comprehensive integration of human characteristics into the definition, design development, and evaluation of a system to optimise Human-Machine performance under specified conditions.
- **Health Hazards** - The identification, assessment and the removal or reduction of short or long-term hazards to health occurring as a result of normal operation of a system.

EQUIPMENT & WORKSPACE DESIGN
System Design
Usability
Human-system interface
Human-human, human machine, human-computer
Anthropometry
Body Size
Body strength & stamina
Limits of strength and endurance
Workplace design
User capabilities and limitations
Stresses and Hazards
Wind, whole body motion, motion induced fatigue, vibration, noise, darkness/dazzle, temperature, sleep loss
Vision and Lighting
Human vision, visual displays and lighting design
Auditory Information
Transfer of information to human operators using their hearing
Voice Communication
Characteristics of speech and hearing
Face-to-face and electronically assisted speech communication
Controls
Optimum size, shape, operating dynamics and spacing
Maintainability
Accessibility
Tools & equipment
Handbooks, Procedures

Organisation & management

TOP LEVEL MANAGEMENT
Safety policy
Budgeting
Resource allocation
Leadership philosophy
PERSONNEL
Selection and check of competence
Education and training
Leadership and supervision
Motivation
Modification of attitudes
Development of social climate
OPERATIONAL
Inspection methods
Maintenance methods and procedures
Operations procedures
System documentation
Manning and watch systems
TECHNICAL
Reliability and availability
System performance
Instrumentation
Monitoring
Automation
Man-machine interface
Work place conditions
SAFETY MANAGEMENT
Management
Organisation
Routines
Inspection and auditing
Feedback
Learning
Emergency planning and training
Health
Environment
Safety at work

● **System Safety** - The human contribution to risk when the system is functioning in a normal or abnormal manner.

Human Resources (Fitting the person to the job):

● **Manpower** - the number of personnel required, and potentially available, to operate, maintain, sustain and provide training for a system.

● **Personnel** - The cognitive (trainability and mental aptitude) and physical (fitness levels, physical size, gender) capabilities required to be able to train for, operate, maintain and sustain a system and provide optimum quality and quantity of the crews to man the ship.

● **Training** - The instruction or the education, and on-the-job or part-task or full-mission training required to provide personnel with their essential job skills, knowledge, values and attitudes.

A simple way to view human factors is to consider three main aspects: *the person, the job (task, environment and equipment)*, and *the organisation and management*, and how they - together with the environment in which the organisation and person are operating - impact on the behaviour of people. This diagram attempts to show the various factors that can influence the inter-action between a human and any system aboard ship, ie: *The Human Element!*

A practical example of how to apply human factors to the design and operation of a Ship Control Centre can be downloaded from the Alert! website: ***www.he-alert.org*** *(ref: HE00130)*

In the next issue:
Exploring ergonomics

Photo: jalens - joachim affeldt

Some Thoughts on cargoes, container ships and the human element

Captain James J McNamara, FNI
President - National Cargo Bureau Inc

As shipboard personnel must live aboard their ship along with the cargo which has been stowed aboard, they are entitled to be fully aware of its characteristics and risks. This is not only a humane consideration but a legal obligation of shippers. Since the arrival of the containership in the 1950s, the amount of pertinent information regarding cargo has diminished, not least through the development of computerized cargo documentation and stowage plans. Although the actual amount of information may be greater than previous, there is far less time to digest this information aboard ship because of smaller crews and the limited amount of time a ship stays in port. Little opportunity exists for the Master to comment on or object to a concern he may have regarding the cargo. In times past, one deck officer was designated "cargo officer" - such designation is rare today. The role of Port Captain, as the shipowner's representative who would assist the Master and Chief Officer during loading, is diminishing. The above factors work together to reduce the knowledge transmitted to the ship about the cargo.

Frequently, while a container ship is berthing, the cranes are positioning themselves on the quay to begin work. It is common for loading and or discharge of cargo to begin prior to the gangway being rigged. Thus, the ship's crew has no opportunity to comment on operations.

As the size of crews has been dramatically reduced, they are primarily concerned with the safe navigation of the ship. It is not abnormal for twelve persons to be manning a typical large container ship - needless to say, there is little time to perform maintenance of the ship or take care of the cargo.

It is interesting to note that tradition maintains that the Master of the ship is absolutely responsible for the ship, her cargo and all aboard. While this is not only a tradition but a legal fact, I wonder if, from a human element standpoint, the role of Master is just that of tradition, or now one of being the legal scapegoat. Also, is it time to admit that the ship's crew is no longer in charge of the cargo, but part of a transport team?

Port State Control and the ISM Code

Port State Control (PSC) is a ship inspection programme whereby vessels entering the waters of a sovereign state are boarded and inspected to ensure compliance with the various major international maritime conventions. Several countries sharing regional interests have grouped together to ensure that vessels trading in their area are not substandard. Currently, there are 8 such groups, covering Europe (Paris MOU), the Asia-Pacific region (Tokyo MOU), Latin America (Acuerdo de Viña del Mar Agreement), Caribbean, Mediterranean, Indian Ocean, West and Central Africa, Black Sea.

Concentrated inspection campaigns were held by the various regional Port State Control authorities between 1 July and 30 September 2002, to establish the degree of compliance to the ISM Code (which came fully into effect in July 2002).

Some of the results are disturbing, not least those revealed by the Paris MOU, which reports that 3210 non-conformities were found - a rise of 260% compared with 2001.

Of a total of 3846 eligible ships inspected in their region during the campaign, 163 were detained for major non-conformities. General cargo ships predominated, while passenger ships, special purpose ships and high speed craft were rated best with no ISM related detentions. Ships older than 15 years showed 12 times as many non-conformities as ships less than 5 year old.

The most frequent major non-conformities found were:

- Certificates and particulars not in order;
- Senior officers not able to identify the "designated person";
- No maintenance routine and records available;
- Master unable to provide documented proof of his responsibility and authority;
- Senior officers not able to identify the company responsible for the operation of the ship;
- Programmes for drills and exercises to prepare for emergency actions not available;
- No certificates on board.

The report concludes that 'ship personnel are not applying the system to the operation of the ship', which in human element terms, means that more care needs to be placed on the human understanding of the system. But, it is clear that a number of other stakeholders - not least some flag state authorities, classification societies, owners and operators - are not working together to ensure that **the master and his crew have the right tools in place, and are properly trained, to ensure the safe conduct of the ship, and the safe and timely delivery of its cargo**.

Port State Control reports can be found at:
www.parismou.org;
www.tokyo-mou.org; www.iomou.org
www.acuerdolatino.int.ar

I'm Afloat

Captain Iain Kerr BA FNI

Captain Iain Kerr BA FNI is a commercial aeroplane pilot and a master on Antarctica support ships. Since 1990 he has been a regulator and a specialist in Human Factors with aviation and maritime safety agencies. He now lives in Canberra and works for the Australian Maritime Safety Authority (AMSA) and can be contacted at iain.kerr@amsa.gov.au. This article is written in a personal capacity and does not necessarily reflect the views of AMSA.

Maritime and aviation have much in common, with many mariners and aviators being dual qualified, and with the two professional transport modes lending themselves to comparison and cross-fertilisation. Human Factors, or Human Effects, are one such area. Aviation may have needed to introduce the Human Factors area of Cockpit Resource Management, to get individualistically trained pilots to work together like the crew of a ship, but it then forged a decade ahead of maritime.

One reason for this was the decision at the International Civil Aviation Organisation (ICAO) Human Factors meeting in Washington DC, in 1993, to move on from papers recognising that Human Factors was a problem, to concentrating on solutions. One of these practical solutions was the very simple, yet highly effective, personal *I'm Safe* check list developed by the USA Federal Aviation Authority - on the principle that pilots use a checklist to make sure their aircraft is safe, so why not use a similar checklist to ensure the pilot is equally safe?

The *I'm Safe* checklist is now widely used around the aviation world and has been credited with significant contributions to aviation safety. In mid 2000 the checklist migrated to the New Zealand Maritime industry (primarily small commercial ships) and was developed into the even better *I'm Afloat* checklist.

Amongst the NZ maritime organisations which incorporated *I'm Afloat* into their organisational quality procedures were;

- New Zealand Underwater for the crew of all commercial dive support boats;
- The New Zealand Coast Guard for the crew of Search and Rescue Boats; and
- Several New Zealand government departments, agencies, and universities operating small boats.

The concept has now crossed the Tasman and appeared in the joint Australian and Russian Federation paper, on the training of officers on Wing in Ground Effect craft, at the IMO meeting of STW 34 in December 2002, as *Crew personal human factor checks*. The Australian paper has been submitted to STW 35 with this specified as being *I'm Afloat*.

I'm Afloat offers a very practical personal Human Factors checklist that works, and it gives a reminder of some of the most important aspects of Human Factors. Obviously, individual items such as wearing lifejackets have to be construed appropriately for the size of the ship - although it would still apply to pilots.

But what use can it be in the all too common case of the mariners, under commercial pressures and swamped with paperwork, picking up a local pilot, heading into what could be a rogue port, and looking forward to security restrictions and several assorted inspections?

No one needs a check list to realise that the mariner is liable to be stressed and fatigued, possibly dangerously so, and will be fortunate if he gets the chance to eat and drink properly.

However, unlike the private pilot or yachty, he can't choose to do something more restful that day. Nor, like the airline pilot, can he simply shut down the engines after arrival and walk away from it all to the hotel shuttle bus, for a couple of days rest and recuperation.

Sadly, all the mariner can do is recognise, while he is still fit to do so, that he would fail the personal checklist, and be warned that he is not at his best.

However, hopefully those who are ultimately responsible for operating the ship, might start to assess their mariners against the *I'm Afloat* checklist, as we move into a new era of shared responsibilities for health and safety, as part of ensuring, through Human Factors projects, that mariners, and ships, ports, and environments, are not at unnecessary risk.

I'	M	A	F	L	O	A	T
Illness	**Medication**	**Alcohol & drugs**	**Food**	**Lifejackets**	**Organised**	**Anxious**	**Tired**
Nothing significant to what you are going to do	With you if needed - but remember what it is masking	No and NO!	Well fed and watered	On board, to hand, and preferably worn	Know what you are doing and are well planned	Not stressed out or distracted	Not fatigued, adequately rested

Accident Investigation Reports

Japan Marine Accident Inquiry Agency
Report on Marine Accidents 2002

The 2003 report on Marine Accidents, by the Japan Marine Accident Inquiry Agency makes interesting reading, not least because of the 6,137 accidents recognised by Marine Casualty Investigators, involving 7,225 vessels. Of these, judgements were made on 834 cases, involving 1,259 vessels, 40% of which were fishing vessels and 17% pleasure craft.

In his introduction to the report, the President of the Agency, Yoshinori Miyata comments on the increase in the number of pleasure boats and foreign flagged vessels in the sea around Japan, amid a reduction in the number of ocean going vessels of Japanese registry - a situation that, he says, 'has been compounded by the increasing complexity of operation patterns, diversification of types of vessel, marine equipment etc, and an increasing trend towards mixed crews of various nationalities.'

The report notes that, while the total number of marine accidents has been decreasing year by year, marine accidents involving foreign vessels have increased to some 200 cases a year. Improper lookout and non-compliance with marine traffic rules are claimed to be the main causes, but in some cases insufficient communication between crew members of different cultures, languages, customs and habits are cited as some of the human factors contributing to marine accidents. Some 80% of these accidents occurred when there were two or more watchkeepers on the bridge.

In general, collisions and groundings account for a large percentage of the total, but machinery failure - primarily through insufficient maintenance, inspection or handling of the main engine, and defective structure, material or improper repair of engine and equipment - is reported as the cause of 25% of the 36 passenger ship accidents.

Passenger ship, cargo ship and oil tanker accidents 2002

Category	Cause								
Collisions (204)	Improper lookout (122)	Non-compliance with marine traffic rules (78)	Failure to sound signals (36)	Inappropriate directions or supervision of work (20)	Insufficient reporting or taking over (11)	Inappropriate speed (11)	Inappropriate manoeuvring (4)	Dozing (3)	Insufficient attention to weather or sea surface conditions (1)
Groundings (67)	Dozing (27)	Non-confirmation of vessel position (21)	Inappropriate directions or supervision of work (12)	Insufficient attention to weather or sea surface conditions (7)	Insufficient study of waterway (6)	Poor selection and maintenance of course (5)	Inappropriate reporting or taking over (3)	Inappropriate manoeuvring (2)	—
Machinery failure (15)	Insufficient maintenance, inspection or handling (21)	Defective structure, material or improper repair of engine and equipment (3)	—	—	—	—	—	—	—

Source: Japan Marine Accident Inquiry Agency Report on Marine Accidents 2002, Tables 11 & 13

Reports & Studies

SURVEY OF THE HEALTH, STRESS AND FATIGUE OF AUSTRALIAN SEAFARERS

The report describes the health and lifestyle behaviours of a large sample of the Australian seafaring population. It also examines levels of stress reported by seafarers, and attempts to explore those factors which most contribute to work stress in the maritime industry. It identifies a relatively small number of industry specific and lifestyle factors as the chief contributors to occupational stress. The industry specific factors were: long working hours, change in the industry, the home/work interface (missing home), broken rest and environmental hardships. The lifestyle factors were sleep type (quality and duration) and stress. In addition, the analysis identified that seafarers' health was compromised at sea to varying degrees by behaviour patterns relating to smoking, drinking, exercise, relaxation and nutrition.

The report can be downloaded from http://trove.nla.gov.au/work/9028724?selectedversion=NBD14122692

IMO GUIDANCE ON FATIGUE MITIGATION AND MANAGEMENT

(MSC/Circ.1014, June 2001)

The IMO guidelines on fatigue mitigation and management contain practical information that can assist interested parties (naval Architects/ship designers, owners/operators, masters, officers, other crew members and training institutions) to better understand and manage fatigue.

The guidelines provide information on the potential dangers of fatigue and ultimately the effect on the health and safety of the personnel working on ships, and on the symptoms and causes of fatigue. They address solutions to combat fatigue in order to reduce associated health problems and prevent fatigue-related accidents from occurring.

MSC/Circ. 1014 can be downloaded from: http://www.imo.org/en/OurWork/HumanElement/VisionPrinciplesGoals/Documents/1014.pdf