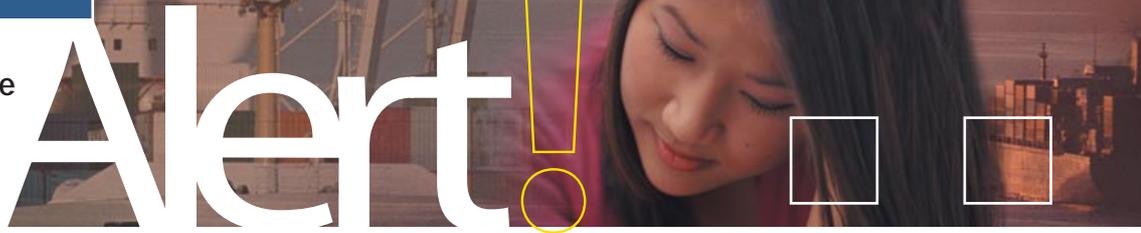




The International Maritime Human Element Bulletin

Issue No. 4 July 2004



Garbage In, Garbage Out....

This edition of *Alert!* is about *human issues* - in the context of *Mind, Body and Spirit*. It addresses some of the many physiological and psychological factors that can affect the ability of the mariner to do his job. The global nature of our business is such that the maritime workforce is multinational and multicultural, which can lead to differing interpretations of international guidelines and inconsistent standards in lifestyle, training and education, working environments and habitability. In our central feature, we examine the many and varied physiological, psychological and spiritual needs of the mariner.

The articles in these Bulletins are written by, and for, maritime professionals from a broad interdisciplinary cross section of the maritime industry. They are deliberately brief and, in many cases, are linked to longer articles, papers and presentations, which are held in the *Alert!* website database at www.he-alert.org, or to other websites.

The *Alert!* project offers a forum for like-minded people to share ideas and solve problems and, through the website, a reference resource for study and information. Contributions to the Bulletin and to the website database are always welcome, as are letters to the editor, which will be published on the website.

The Editor
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Winner
Innovation in Ship Operations Award

People are important and ships need good, qualified, and motivated people to operate well. The use of technology has been introduced into many aspects of ship operation and design in recent years in order to reduce manning levels and costs, and improve operations.

Previous issues of *Alert!* have examined *Performance Influencing Factors* (Issue 2) and *Ergonomics* (Issue 3), but what of the basic human needs of the *Mind*, the *Body* and the *Spirit*? Today's maritime employment trends often concentrate on low crew costs, with workloads and living environments that can cause fatigue and frustration. Is this value for money?

One mariner, in a letter to *Alert!* suggests that the only motivation at sea now is money; that short turn-around times and pressure of work ensure that shore leave is brief and infrequent; and that ethnic and cultural diversity limit social life.

He adds: *'Seamen are intensely proud of their job, their position, and their uniform yet we are increasingly feeling alienated from the world around us.'* He suggests that *'the most effective way to treat the human element is to treat the seafarer as a human, with human pride.'*

The term Garbage In, Garbage Out (GIGO) is one of the great proverbs of the computer age which says that if invalid, inaccurate or inappropriate data is entered into a system, the resulting output will be invalid, inaccurate or inappropriate. In other words, the quality of the output is directly dependent on the quality of the input.

If we apply this to the maritime human element, the personal output of the mariner is dependant on 7 needs:

- Moral values (*Spirit*)
- Self actualisation (*Spirit*)
- Happy & healthy lifestyle (*Body*)
- Attitude (*Mind*)
- Safe & secure working environment (*Body*)
- Competence (*Mind*)
- Motivation (*Mind*)

As most shipboard systems depend on some level of human involvement, the human link is a potential frailty that needs to be managed, monitored and nurtured. Healthy, happy, well trained and motivated mariners are essential to the safe running and commercial efficiency of any ship.

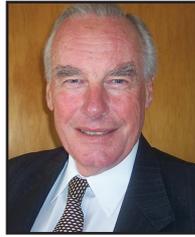


Mind, Body, Spirit

Improving the awareness of the human element in the maritime industry

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Rod Short

Maritime Education and Training Providers take the Initiative

The Association of Maritime Education & Training Institutions in Asia Pacific (AMETIAP), founded in Hong Kong in 1996, has 89 Member Institutions in 22 economies, 2 Honorary Members and 12 Associate members. AMETIAP secretary, Rod Short, explains the importance of such an Institution.

Global manning and technological development will continue to impact on seafarers. As an industry that must recruit its seafarers from wherever best meets its needs, shipping is at the forefront of globalised employment. Modern technology has resulted in a greater monitoring role on the part of those controlling a ship at sea. The daily challenges of the former 'hands-on' roles have decreased. Work at sea brings little personal fulfilment for many seafarers.

Despite many endeavours - STCW, the 'White List', national regulation, and the steps taken by responsible ship owners and managers - standards of Maritime Education and Training (MET) differ widely.

The rapid increase in the numbers of commercial training centres in several major manning countries has led to many 'graduates' who lack basic competence or even understanding of the industry they are entering, yet still find employment on board ship.

To ensure the industry is able to access the competent workforce it requires, these needs must be taken into account in the development of appropriate MET. Globally much needs to be done to address serious human issues.

Through association and through creating a 'voice' for MET, the providers and interested parties are ensuring a more effective role in developments that recognise the needs of safe and efficient ship operation, but also the need for more to be done about very important human needs, particularly with multi-cultural crews.

The development of AMETIAP is a major initiative by the MET providers to assist in addressing these issues.

Alert!

The International Maritime Human Element Bulletin

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Maritime Resource Management - Taking Bridge Resource Management one step further



Martin Hernqvist
Manager,
Loss Prevention &
Information Services
The Swedish Club

Around 1990, marine insurers intensified their efforts in the loss prevention field. An important reason was that premiums had reached the bottom in the premium cycle and while it seemed hard to influence the income, the focus turned to the cost of claims. The Swedish Club was no exception and in 1993 a full time loss prevention officer was employed. Since then, The Club has spent a lot of time and effort in investigating and trying to get a better understanding of the causes of accidents.

Investigations carried out show that a breakdown in communication and teamwork is a common factor in many

major claims. To tackle these and other causes related to human behaviour, *The Swedish Club* became involved, some ten years ago, in the development of *Bridge Resource Management (BRM)* training. This training focuses on personal attitudes rather than conventional navigating and ship handling skills. The overall aim is to foster a behaviour where all available resources - team members, pilots, equipment, procedures, VTS etc - are used in an optimum way leading to the safest possible passage.

Together with its 13 licensed training providers, *The Swedish Club* recently took a decision to rename the course *Maritime Resource Management (MRM)*. Since the resources that have to be managed are not always concentrated on the bridge we believe that the new name will reflect both the content and the objectives of the course more accurately. In addition, it is our hope that all target groups - bridge officers, engineers, pilots and shore-based personnel will feel more comfortable with this.

A more comprehensive paper on MRM, by one of the training providers can be downloaded from the website www.he-alert.org. (ref: HE0070)

Crew Endurance Management: Extending Beyond Fatigue

The Human Element and Ship Division, United States Coast Guard

Normal maritime operations expose crewmembers to a variety of operational risk factors, which, left unmanaged, can degrade crew endurance, and thereby both performance and safety levels.

Traditionally, most efforts addressing the human element have been directed towards fatigue management. These and other narrowly focused attempts failed to address the wide range of interrelated

variables affecting crew performance within a complex marine safety culture.

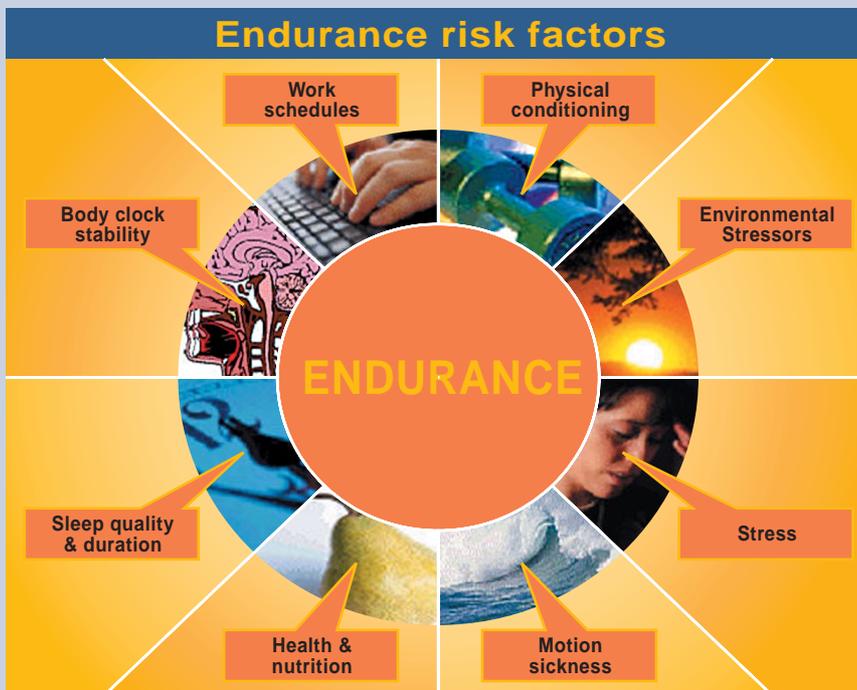
Aware of this situation, the U.S. Coast Guard's Research and Development Center established Crew Endurance Management (CEM), a scientifically based program for improving performance, safety, and morale while simultaneously enduring job-related challenges. It addresses a broad scope of environmental, operational, physiological, and psychological factors.

Success in implementing CEM is dependent upon the participation, leadership, and commitment of a vessel's management, operators, and crew. A Crew Endurance Working Group (CEWG) comprised of representatives from all levels of the vessel's operation is established to identify and address the specific endurance risks pertinent to its operations. It examines an organization's operational policies regarding matters such as sleeping and eating times, efforts to reduce noises for off-watch personnel, and the consideration of individual behaviors such as diet, exercise, and stress.

The CEWG also enlists the expertise of a CEM Coach; a crewmember trained in the science behind, and effects of, 15 interrelated risk factors, which include those of temperature, motion, vibrations, intensity of lighting, and other physical considerations aboard a ship. Once the group has identified which factors affect its operations, they can begin to prioritize, devise, and deploy CEM plans aboard.

Although only in its beginning stages, the U.S. Coast Guard has made measurable progress with CEM deployment, including a demonstration project with American Waterways Operators involving six towing companies.

Crew Endurance Management Practices: A Guide for Maritime Operations can be downloaded from the website www.he-alert.org (Ref: HE00265). For further information contact Lt Sam Stevens: sstevens@comdt.uscg.mil.



Seafarers with Spirit

Rev Dr John Strain
Director, Centre for Applied and Professional Ethics, University of Surrey (UK)

To be human is not just to have bodily and mental needs as defined by the human sciences. It is also to be a person with purposes and intentions that transcend the here and now, reach across into the mysteriousness of the future and involve us in deep and treasured relationships of love with other people and with God, in ways articulated within different traditions of faith. In short, we are people of spirit as well as mind and body.

Despite the commonly held assumption that secular attitudes prevail, the sociological evidence is that relatively few people have turned away from belief in, and experience of, the sacred and the spiritual. Across the globe, seven major religions account for 83% of the world's population. Amongst seafarers, belonging to religious traditions is particularly common - some 60% of them are Christians, a high proportion is Roman

Catholic and many others belong to the Islamic faith.

Human rights legislation requires that people are not denied opportunities to practice their faith. It is a challenge to the maritime industry to ensure appropriate opportunities are provided to the seafarer.

The International Christian Maritime Association (ICMA) <www.icma.as> maintains an online Directory of Christian Centres, Chaplaincies and Seamen's Welfare Agencies throughout the world.

People: Mind, Body & Spirit

MIND

Driver

Education, training, competencies

motivator:

Knowledge, understanding, aptitude, skill, proficiency

Driver

Self awareness, self evaluation

motivator:

Mental ability, intelligence, personality, character, sensitivity

Driver

Communication, direction, teamwork, empowerment, character building

motivator:

Leadership interoperability, adaptability

BODY

Driver

Balanced diet, habitability, hygiene, exercise, rest, recreation, medical screening, D&A testing

motivator:

Energy, physical fitness, physical strength, stamina, wellbeing

Driver

Ergonomics, safe working practices, protective equipment, physical security

motivator:

Safety culture, security awareness

SPIRIT

Driver

Personal ethics, conscience, cultural integration, leadership, supervision, remuneration

motivator:

Pride, sense of purpose, identity, aesthetics, conviction, trust, expectation, realisation, belonging, loyalty, esteem, fellowship, security

Driver

Religious belief, faith, self discipline

motivator:

Cultural awareness

The 7 needs of the mariner

leads to:
Competence

leads to:
Attitude

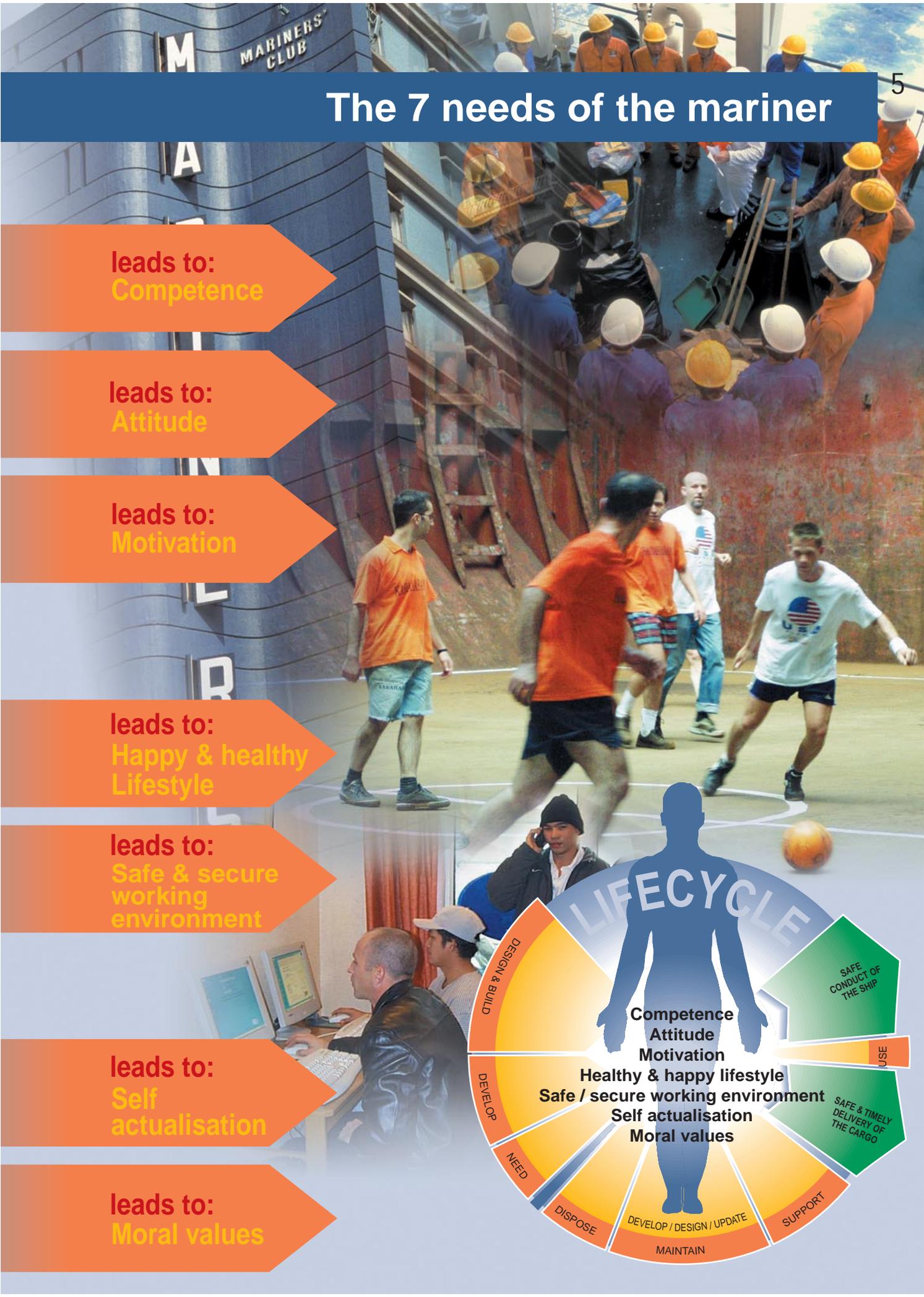
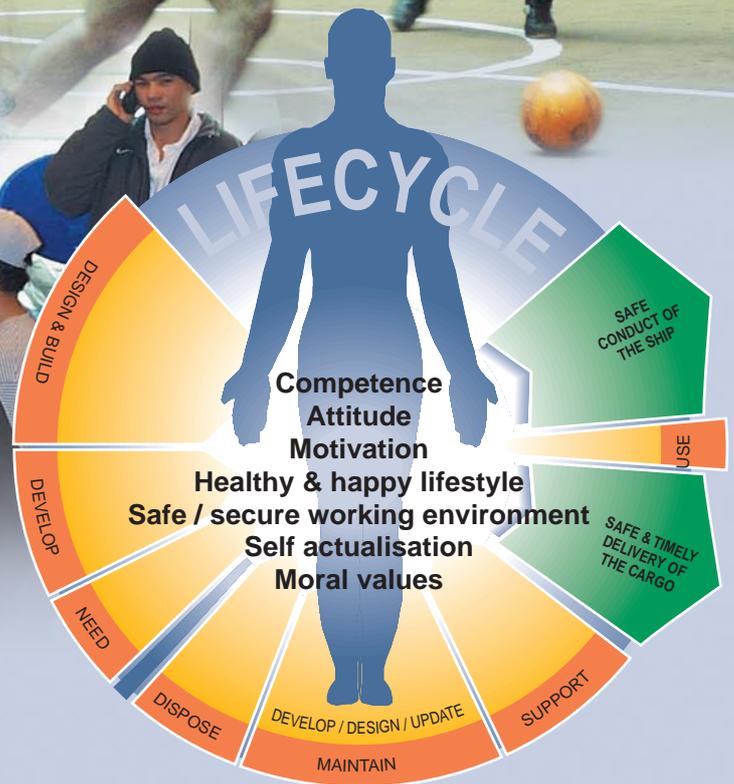
leads to:
Motivation

leads to:
Happy & healthy
Lifestyle

leads to:
Safe & secure
working
environment

leads to:
Self
actualisation

leads to:
Moral values





Joined up maritime health

*Dr Tim Carter
Secretary,
International Maritime Health Association*

Illness at sea matters. For example, a sudden collapse on the bridge can directly put a ship at risk. Commonly it requires emergency attention by crewmembers and evacuation or diversion. Both pose risks to ship operations and safety. Even more frequently, seafaring careers and sometimes lives are cut short by illness and disability which can be avoided by care for personal health and by working conditions which do not pose accident or health risks.

Like most aspects of the maritime industry health has lots of rules: certification of medical fitness, medical first aid training, medical stores, radio-medical advice, and care for ill seafarers in foreign ports. Like most rules these are often followed unthinkingly without either considering their adequacy or how well they are observed if they conflict with economic priorities. Even the latest proposals by the International Labour Organisation (ILO) for revision of the Maritime Labour Conventions leave health scattered at four or five different places in the verbiage, without a thought about how the 'health system' can best function.

The key relationship is that fit seafarers and safe working conditions will reduce the toll which ill-health takes on safety, operations and costs. Yet there have been few attempts to look at how to optimise prevention to reduce such risks. In this respect seafaring is well behind aviation and other safety critical industries.

Take heart attacks - which are by far the commonest fatal illness at sea - and consider how the risks can be reduced. Ships have gone aground with a dead master alone on the bridge; crews have been severely taxed looking after seriously ill colleagues; and not a few casualties land up in hospitals far from home. For those who have had an attack their career at sea may sometimes be over, although with changes in fitness standards this is now not always the case.

Saving lives, in this context, is not about emergency treatment but is about attention to personal risk factors such as diet and smoking. The maritime lifestyle has not helped but these factors are readily addressed jointly by seafarers and their employers. Regular medical assessments can look for risks such as high

blood pressure, diabetes and poor weight control.

Joined up thinking about health is not difficult, but joined up action needs an approach that is not just rule-based but one that assesses risks, costs and losses and evaluates the most cost-effective way of preventing them.

If the goal is to be a safer maritime industry which safeguards its assets of experienced seafarers, then critical thinking about how to reduce health risks is needed. It is already happening in a few shipping companies. It is being encouraged by some forward looking insurers, trade unions and maritime authorities and there are accessible sources of expertise available from bodies like the International Maritime Health Association and also from academic groups, often derived from the successes of disease prevention and health promotion onshore.

Further information about the International Maritime Health Association can be found at www.imha.net

A series of articles by Dr Carter on specific aspects of seafarers' health can be found at http://seafarerswelfare.org/41_medical.htm



Communication - a step towards Emotional Intelligence

*Commander HN (Retd) Nicholas A Iliopoulos
Centrofin Management Inc*

Twenty three seafarers onboard a vessel do not necessarily constitute a team just because it comes under that heading, nor do teamwork values ensure team performance by themselves. The essence of a team is common commitment, and an effective team is always worth more than the sum of its parts, under basic disciplines.

The initial constraints of the team's right size and the correct mix of complementary skills, e.g. technical and functional expertise, problem solving and decision making, to perform the job well, have already been determined by years of ship design and sea-going experience - with the Master at the helm.

However, what seems to be missing, sometimes, is effective communication between the team ashore and the multinational-multicultural group on

board. This in turn depends on the interpersonal skills used. By this I mean Emotional Intelligence which for some time has been used to try to create, amongst its members, a feeling of mutual trust, a sense of identity - we call it 'family' - and a feeling of efficacy.

Once these conditions are recognised the team then becomes more competent to successfully deliver the 'objective' points by achieving higher levels of participation, cooperation and collaboration. Easier said than done!

The emotions should be deliberately brought to the surface, analysed and understood and the close relationship, both internally and externally, should be established and maintained. The ability to face the high risk challenges at sea has to be strengthened in many ways.

People draw their emotional cues from those around them. We consider it to be the top management's responsibility to have established the norms for both Confrontation and Caring. The former may seem illogical but it isn't; the group must feel comfortable to call foul, in either direction. Caring behavior is easier; it usually only needs concentration from top to bottom on the small matters. It is profoundly important to display positive regard, appreciation, respect, support and compassion.

Our quarterly bulletin WAVELENGTH, addressed to our seafarers in this manner, aspires to develop the willing and talented mariners to the point that eventually surpass us in knowledge and ability.





Seafarers' wellbeing ⁷ an holistic approach

*The Reverend Canon Ken Peters
Justice & Welfare Secretary
The Mission To Seafarers*

It is clear that there are no more important factors in the safe operation of ships than health of the crew and the ship board environment.

An holistic approach is needed, with all concerned recognising that it is in partnership that the best shipboard environment is achieved. Legislators, regulators, administrators, company and seafarer all have the responsibility of making a healthy environment. The IMO has stated that *'Maritime administrations must ensure a safety culture'* and that companies take *'all appropriate measures to encourage pride of service and professionalism on the part of personnel they employ.'*

Human error is often quoted as the most common cause of maritime accidents. The safety of the vessel depends upon the skill, vigilance and physical/mental fitness of the seafarers. The health and fitness of seafarers must be maintained in order to ensure the safe operation of a vessel. Working conditions significantly impact upon seafarers' health and well-being.

Seafarers' holistic well-being is not to be found in simply ensuring that medical provisions and procedures on board match up to international statutory requirements. It is in the value added empowering of seafarers with an education in healthy life style choices that makes the significant difference. So it is that the holistic view needs to be taken. There needs to be a recognition that in the range of health care provisions, body, mind and spirit need to be nourished and to be healthy. The psychological stress and strain can be more all-encompassing than a seemingly isolated physical symptom. Assimilating the social mores of a multinational crew can be very exhausting for seafarers. Avoiding offence to another's customs, culture and creed can be a daily minefield in the close confines of the ship's social and working life. Some seafarers readily take to the adventure of social dialogue with members of the crew from other nationalities but others find the 'mismatch' can sometimes be overpowering. Crewing agencies need to take this into account when billeting a ship.



Fig 1: The Destructive Hermeneutic Cycle



Fig 2: The Empowering Hermeneutic Cycle

Dr. Chris Shin, Medical Officer of West Yorkshire Police (UK), summarises this holistic view according to two overarching principles. The first is to recognise that the principle of anabolism actively promotes the body's own internal maintenance systems, ensuring proper growth, repair and replacement of body tissue, stability of body chemistry, balanced physiological mechanisms and efficient defence against infections and cancer. Of central importance to this system is that:

- sleep be approximately eight hours per day
- rest requires a 'feet up and mind disengaged' characteristic
- close personal relationships present a safe haven to return to away from life's hassle
- self esteem means a feeling of being victorious in life's struggle and that the diet entails sensible quantities of healthy food, preventing obesity

The counter posing catabolism is characterised by:

- physical exercise
- mental effort
- emotional strain
- metabolic excesses (e.g. heavy meals, alcohol in excess of 2-3 units per day)
- loss of self esteem (the feeling of defeat and despair exacerbates the catabolic process)

Without a balanced lifestyle seafarers become vulnerable. Vulnerability translates into inefficiency and in the context of shipboard life there is the problem that focus on the job in hand as well as general concentration drops to levels that are dangerous. Safety of life at sea is compromised by the destructive cycle of personal behaviour (Fig 1). The consequences for personal health are disastrous and the implications for the safe running are such that no amount of certification with ISM, STCW or any other standard will rescue the ship.

Attention to the whole person with due regard to body, mind and spirit, enables and empowers the individual to the point that personal behaviour and life style is not only healthy for the individual but reflects in the interaction with the whole crew (Fig 2). The effects on crew moral translate into increased efficiency and more importantly the safe running of the ship is optimised and safety is no longer compromised.

"The standard of safety of a ship is dependent not only on the health of the ship but more on the health of the seafarers in charge of the operation of the ship."

(M. Fuazudeen - Technical Officer STCW & Human Element Section, Maritime Safety Division, IMO at the 6th International Symposium on Maritime Health, 5-8th November 2001, Manila)

The Mission to Seafarers' website can be found at www.missiontoseafarers.org

Other useful websites:

The International Committee on Seafarers' Welfare (ICSW): www.seafarerswelfare.org

Grounding of a vessel *due to the failure of the ship's electrical power supply*

This report from the Australian Transport Safety Bureau concerns the grounding of a 110,541gt bulk carrier, during a pilotage, not as a result of navigational error but because of the total failure of the ship's electrical power supply and the lack of timely intervention by the crew, when the risk to the ship could have been mitigated.

The ship grounded as a direct result of a loss of steering because the ship's three main generators had tripped off the main switchboard due to water contamination of their fuel supply, and because the emergency generator failed to start automatically due to a previously undetected fault in one of its starting batteries.

The chief engineer did not communicate the gravity of the generator problem to the master. Given his uncertainty regarding what had caused the generator shut downs, and his awareness of the ship's critical navigation situation, the chief engineer should have discussed the situation more fully with the master, which would have given the master the opportunity to form a contingency plan, in consultation with the pilot, to mitigate the risk to the ship.

Pertinent observations from the report are that:

- *The emergency generator was tested, on average, once a month with the last time being 12 days before the incident. The report comments that while SOLAS does not stipulate a specific test interval for the emergency generator, it does so for other critical safety equipment, which must be tested weekly. It adds that it seems inconsistent that emergency generators should rate operation and inspection as infrequently as once every month, and that had the generator been tested in the week prior to the incident, it is possible that the problem with the starting battery may have been discovered and rectified.*
- *In critical ship's operations, like pilotage, there is a need to ensure that communication is effective between the bridge and the engine room.*
- *There are no requirements for engineering officers to undergo Bridge Resource Management Training.*
- *The ship's safety management system*

checklists for this type of breakdown were of a general form and, as such, would not have provided any guidance or advice which would have been of assistance to the master or chief engineer during the events which occurred.

- *Although the ship's safety management system provided for periodic training for such emergency situations, this scenario had last been practiced more than ten months prior to the incident.*

The report recommends that Shipowners/managers should:

- *Review the procedures for, and frequency of, testing emergency power generation arrangements on their ships to ensure that this equipment has the highest possible reliability and availability.*
- *Consider Bridge Resource Management training for engineering officers.*

The full report is available from the ATSB website at:
www.atsb.gov.au/marine/pdf/184_hanjin_dampier.pdf

Reports & Studies



A RESEARCH AGENDA IN MARITIME CREW RESOURCE MANAGEMENT

Michael Barnett, PhD; David Gatfield, MSc; Claire Pekcan, MSc

This paper opens with a brief introduction to the development of Crew Resource Management (CRM) training in the international shipping industry. It charts the development of the shipping industry's approach to the preparation of bridge and engine room teams for normal and abnormal operations, and critiques the current training regime in resource management. The paper provides an overview of three research initiatives, in order to:

- *gain a better theoretical understanding of the nature of shared situational awareness and mental models in "real world" maritime operations.*
- *identify a set of behavioural markers for assessing the non-technical skills of crisis management.*
- *explore the role of organisational factors in safe operation, in recognition of the limitations of operator training as a panacea to prevent the re-occurrence of accidents.*

The paper can be downloaded from the website www.he-alert.org (Ref: HE00240)

PRINCIPLES OF SAFE MANNING

IMO Resolution A.890(21)
 - 4 February 2000

At its 21st session in November 1999, the IMO Assembly adopted resolution A.890(21) on principles of safe manning. Amendments to the resolution were adopted by the 23rd Assembly through Resolution A.955(23).

The resolution notes that safe manning is a function of the number of qualified and experienced seafarers necessary for the safety of the ship, crew, passengers, cargo and property for the protection of the marine environment and that the ability of seafarers to maintain observance of the requirements is also dependent upon conditions relating to *training, hours of work and rest, occupational safety, health and hygiene and the proper provision of food.*

Copies of the Resolutions can be downloaded from the IMO website at:
www.imo.org/includes/blastDataOnly.asp/ata_id%3D9047/890.pdf
 and
www.imo.org/includes/blastDataOnly.asp/data_id%3D9048/955.pdf