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**The International Maritime Human Element Bulletin**

Issue No. 6 January 2005

# Competent people *make the difference*

Education is the gradual process of acquiring knowledge through learning and instruction. It is as much about the development of personal attributes through upbringing and observation as it is about gaining knowledge through textbooks. It is a lifelong process; we never stop learning, whether through formal education (degree courses, Continuous Professional Development, etc) or through the 'University of Life' (observation and experience).

Training is the development of skills or knowledge through instruction or practice. If correctly applied, it is a planned systematic development of the aptitude, knowledge, understanding, skill, attitude and behaviour pattern required by an individual so that he/she can adequately carry out a given task or perform in a particular job.

Together, education and training are about the development and maintenance of the human component of ship systems: the mariner. However, the education and training of designers, surveyors, trainers etc is equally important, not least knowing how to specify and deliver the human component of ship systems, and having an up to date knowledge of 'the ways of the sea'.

The competence of a mariner will depend not only on good and effective education and training, but also on his aptitude, knowledge and understanding of the subject, on the availability of opportunities to develop his skills and, ultimately, his experience.

Competent people make the difference - they make the ship safe.

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) recognises the importance of establishing detailed mandatory standards of competence necessary to ensure that all mariners are properly educated and trained, adequately experienced, skilled and competent to perform their duties. However, in the way of all international Codes, the standards of competency set out in STCW are a minimum set. Furthermore, the maritime workforce is now multinational and multicultural. This may allow differing interpretations of international guidelines and inconsistent standards in training and education. Indeed, there are still numerous reports, mainly anecdotal, of poor standards of education and training in the maritime sector.

In fairness, there are owners, managers and manning agents who invest in the education and training of their mariners to beyond the minimum criteria set out within the STCW Code - but are they in the minority?


*Making the difference*

The theme for this Issue of *Alert!* is *Education and Training.* It is an emotive subject which will undoubtedly generate discussion amongst the various maritime stakeholders. But, learning is important, particularly in this global maritime industry in which standards of education and training vary and where technology is revolutionising the way in which we do our business. It would appear that awareness, effective communication, common sense and basic seamanship and engineering skills are taking a back seat to increased automation and electronic decision support systems etc.

It is important, therefore, for all stakeholders to be aware of the human element issues associated with the human machine interface, and to encourage and promote the highest standards of education and training, and a common spirit of professionalism in the industry.

The *Alert!* project is a forum for like-minded people to share ideas and solve problems on human element issues. The website - **www.he-alert.org** - provides 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 can now be uploaded and published on the website, or addressed direct to:

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Alert!

The International Maritime Human Element Bulletin

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# Managing fatigue


***Dr. William Moore***
*Vice President,*
*Loss Prevention and Technical Services*
*Shipowners Claims Bureau, USA*


Fatigue has long been a challenge for seafarers and a concern for shipowners as a key contributor to human errors that lead to injury, loss of life and property and marine casualties. As a result, the American P&I Club has taken a proactive approach to articulating the risks of fatigue in a way that is attractive to seafarers of all skill levels and backgrounds through its most recent publication, *Preventing Fatigue.* This is an easy-to-read and user-friendly publication for seafarers as a means to familiarise themselves with the risk of fatigue while working aboard ship.

*Preventing Fatigue*, with its easy-to-read format made memorable by an undercurrent of humour, 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 having a measurable effect in reducing accidents over the years ahead.

The publication of *Preventing Fatigue* was a direct response to comments made at the last session of the Joint Maritime Safety Committee and Marine Environmental Protection Committee Joint Human Element Working Group that met in May 2004. Comments were made during the meeting that it would be beneficial to communicate important IMO documents in a format that is user-friendly for seafarers.

*Preventing Fatigue* is the first in a series of similar publications to address human element related accident prevention. The next publications will address the prevention of work place injuries such as slips, trips and falls and marine pilotage.


*For further information, please contact Dr. William Moore at +1 212 847 4542 or wmoore@american-club.net.*

# Invest in yourself

The IMO has developed the STCW Convention to establish the requirements for basic competencies of mariners. Governments ensure that their nationals are trained to these standards and ship owners/operators often exceed these minimum standards to meet their need for quality and specific operations.

However, training and education isn't something that is 'done' to mariners - it is a process in which the mariner actively participates out of an interest to do their job well. Key incentives for doing a job well include continued employment, keeping safe, and the prospect of promotion.

Promoting one's own career is a personal objective, and although a company may have an interest in helping out, for their own benefit, each mariner should have a self-interest in maintaining or advancing his/her ability to do a job well. This gives them job security, a sense of achievement and the ability to have choices in life. To do this one must embark upon a programme of continuous personal or professional development (CPD), which has been defined as the systematic maintenance and improvement of knowledge, skills and competence, and enhancement of learning, undertaken by a person throughout his or her working life.

Some professions such as Marine Engineers and Naval Architects have formalised programmes of CPD through their professional bodies (IMarEST & RINA respectively) where CPD points are obtained by attending conferences or courses and a minimum number of points are required each year. However, the application of CPD does not have to be formally structured - it can be a personal goal.

Personal development can be achieved through activities such as reading relevant journals, attending lectures or seminars, using computer or Internet based training (CBT/IBT) or taking courses. If you know where you want your career to go, you can take specific steps to get there. If you don't have a clear vision, keeping up-to-date with new technology and regulations or developing skills in subjects like language, management or IT are always useful.

Self-development is a life long adventure - improve your value by investing in yourself.

# Training a multinational workforce

*Some thoughts from the master of a 37,000 dwt chemical tanker, with a multinational crew.*

This is a very complicated vessel to run and crew education and training is very important; we operate a programme of Computer Based Training (CBT) onboard. Crew are encouraged to do as much extra training as they can and if the 'mandatory' sections are not completed onboard they are taken into the Manning Agency office to do it. Courses vary from the application of the Collision Regulations (Colregs), to security and to engineering.

While all junior deck officers have basically the same minimum seafaring education standards, we have noted that there are definite differences in their ability to do the job well, and this is often down to the nationality of training. It is clear that the application of the Colregs is not being taught to such a high standard, on an international basis. There is very little understanding of seafaring common sense or seamanship. For example, the Chief Officer will be called for everything, because no junior deck officer will make a decision. The VHF is a favourite anti-collision tool and they are loath to look out of the window or appreciate the limitations of equipment such as ARPA. The way to get around this is through continual training and advice.

The general education of some nationalities of junior engineering officers is good, but their culture can be one of acceptance rather than having an inquiring mind, and ultimately fault finding suffers.

My senior officers set high standards and are very well educated; they take a great personal pride in their work. However, they have seen a dumbing down of standards in their various authorities, and of cutting cadet training times. I feel that the ISM Code has in some ways contributed to this - after all, who needs common sense and seamanship when checklists tell you exactly what to do?

*Editors Note:*

*The mention of individual nationalities has been removed from this piece, because it is not appropriate to generalise here. However, it is important to note that standards of training do vary and differences caused by culture and language need to be addressed when identifying training needs and building effective teams. Competence applies to teams as well as individuals and the safe and effective ship is the one with a 'competent crew'.*

# The value of the training ship *in the training of seafarers*

***Captain Gang Hu***
*Former Master MV Yu Feng*
*Shanghai Maritime University*

The 10,124 tonnes deadweight MV YU FENG is an ocean-going cargo vessel for navigation training, teaching and research, run by the Shanghai Maritime University (SMU). She is mainly sailing in Japan, Korea, Russia and other Southeast countries.

The facilities on YU FENG are advanced and complete. She has a training bridge, training control room, classrooms, laboratories and necessary living and entertainment facilities. She provides a favourable training, research and practice site for all faculties and students of SMU.

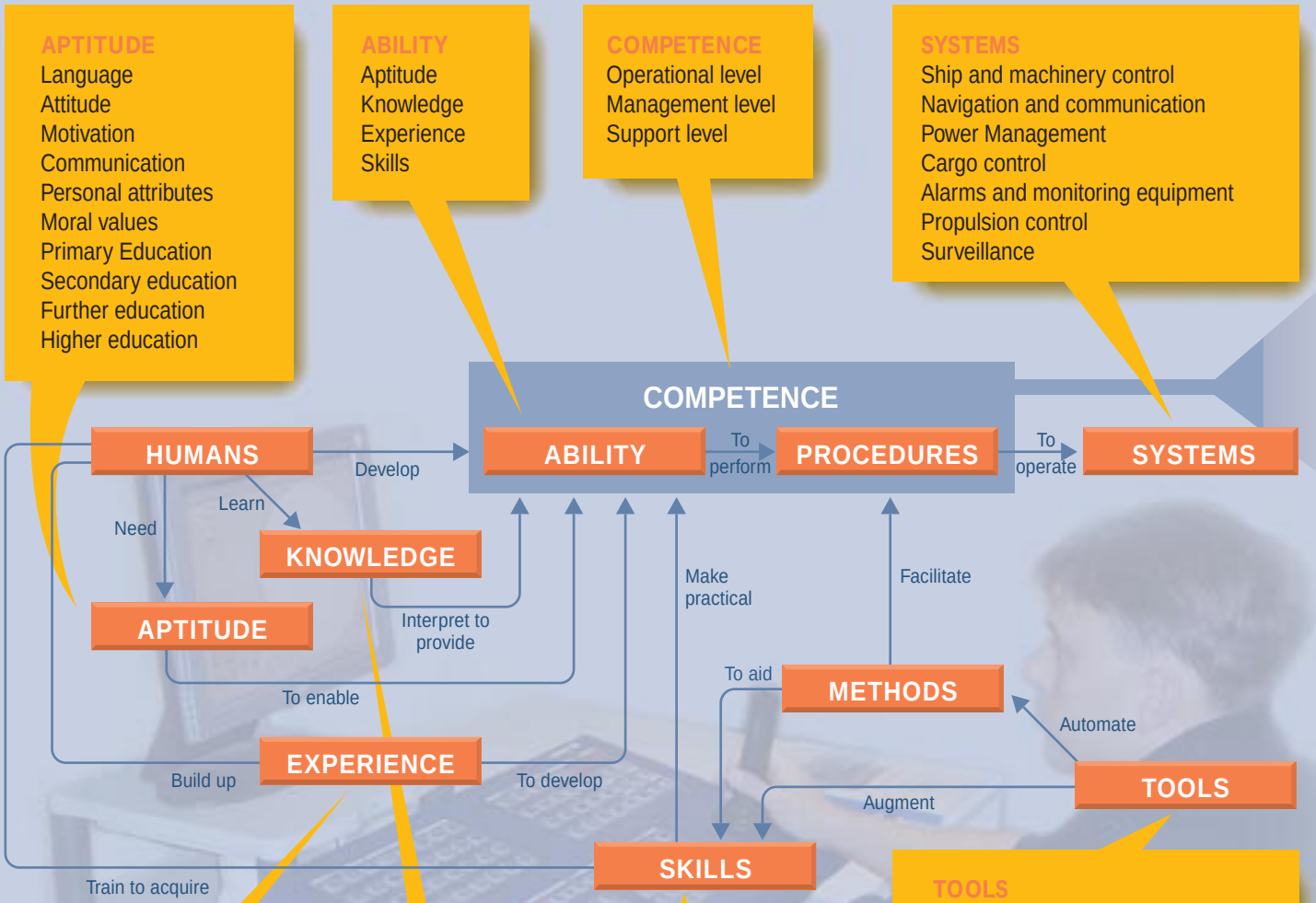
Each year, 12 classes of students (over 360 persons) from the navigation and engineering departments are admitted on board for training. The YU FENG makes a great contribution towards the training for high-level seafarers.

I had been the captain of YU FENG for more than 30 years. During my career life, I regarded the training ship as an important and flexible classroom for seafaring education. Through the training on the training ship, the students will realize the good quality and unflinching willpower of seafarers, as well as the importance of working hard on board. Moreover, the students can witness and experience the whole process of ship's management and operation, which can inspire them to work harder and obtain more knowledge conscientiously.

Such experience and knowledge cannot be obtained by the students in the university classroom. Only in such a special classroom can they learn much more knowledge about seafaring from their own training experience.

In short, training students on the training ship is an absolutely necessary link in their programme of maritime education. It is obvious that the training ship plays an imperative part in the training of seafarers. I believe the value of the training ship in the training of seafarers is inarguable.

# The development and maintenance of the




**APTITUDE**
Language
Attitude
Motivation
Communication
Personal attributes
Moral values
Primary Education
Secondary education
Further education
Higher education

**ABILITY**
Aptitude
Knowledge
Experience
Skills

**COMPETENCE**
Operational level
Management level
Support level

**SYSTEMS**
Ship and machinery control
Navigation and communication
Power Management
Cargo control
Alarms and monitoring equipment
Propulsion control
Surveillance

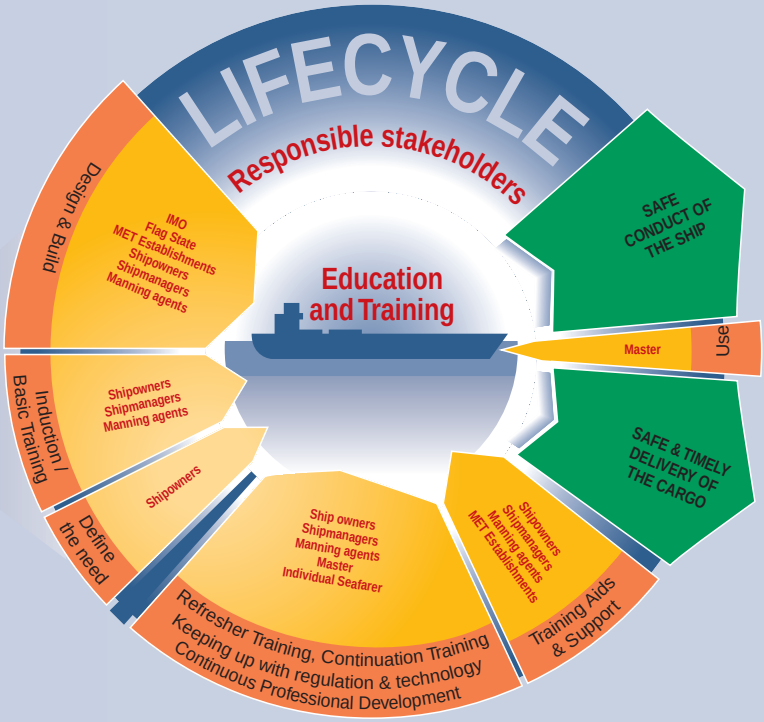
**EXPERIENCE**
Proficiency
Professionalism
Continuous assessment
Keeping up with technology
Continuous Professional Development
Lifelong learning

**SKILLS**
Awareness
Communication
Information management
Language
Leadership
Management
Proficiency
Teamwork

**TOOLS**
Automatic Radar Plotting Aid (ARPA)
Automatic plotting devices
Electronic Navigation Charts
Temperature monitoring
Electronic logbooks
Liquid level control
Decision support software
Data loggers
Mimic displays

**KNOWLEDGE**
Controlling the operation of the ship
Care for persons onboard
Cargo handling & stowage
Marine engineering
Maintenance & repair
Electrical electronic & control engineering
Radio communications
Personal survival
Fire prevention & firefighting
Elementary First Aid
Personal safety & social responsibilities
Survival craft & rescue boats
Fast rescue boats
Advanced firefighting
Medical First Aid
Medical care onboard ship
Safety
Security
Management and administration

**TRAINING DELIVERY**
Induction
On the job training
Distance learning
Computer Based Training (CBT)
Simulation
Training vessel
Onboard continuation training
Refresher training
Task specific training
Cascade training
Self education




**OTHER TRAINING NEEDS**
NOT CURRENTLY IMO SPECIFIED
AIS
Ballast Water Management
Bridge Resource Management
Crew Resource Management
Diet
Drug and Alcohol Prevention
Electronic surveillance equipment
Enclosed Space Entry
Engine Room Resource Management
Engine Room Systems Management
Environmental Awareness
Fitness and health
Helicopter Operations at Sea
High Speed Navigation
International Safety Management Code
Inventory Control
Leadership and teamwork
Managing fatigue
Maritime Resource Management
Principles behind and operation of IBS and INS
Personal attributes
Practical shiphandling
Risk & Safety Management
The use of electronic charts
Vulnerability of electronic position fixing devices

**IMO MODEL TRAINING COURSES**
(FOR USE BY TRAINING ESTABLISHMENTS)
Advanced Fire Fighting
Assessment, Examination and Certification of Seafarers
Chief and Second Engineer Officer (Motor Ships)
Crowd Management/Passenger Safety
Dangerous, Hazardous and Harmful Cargoes
Elementary First Aid
Engineer Officer in Charge of a Watch
Tanker Familiarization
Engine-Room Simulator
Fire Prevention and Basic Fire Fighting
General Operator's Certificate for GMDSS
Hull and Structural Surveys
ISPS - Company Security Officer
ISPS - Port Facility Security Officer
ISPS - Ship Security Officer
Marine Accident and Incident Investigation
Maritime Search and Rescue Mission Co-ordinator
Maritime English
MARPOL 73/78 - Annex I
MARPOL 73/78 - Annex II
Master and Chief Mate
Medical Care
Medical First Aid
Officer in Charge of a Navigational Watch
Oil Tanker Cargo and Ballast Handling Simulator
On-Board Assessment
On-Board Ship Administration
Operational Use of ECDIS
Personal Safety and Social Responsibilities
Personal Survival Techniques
Port State Control
Proficiency in Crisis Management/Human Behaviour
Proficiency in Fast Rescue Boats
Proficiency in Survival Craft and Rescue Boats
Radar, ARPA, Bridge Teamwork and Search and Rescue
Radar Navigation, Radar Plotting and Use of ARPA
Radio Personnel
Restricted Operator's Certificate for GMDSS
Safe Packing of Cargo Transport Units (CTUs)
Second-Class Radioelectronic Certificate for GMDSS
Ship Simulator and Bridge Teamwork
Specialized Training for Oil Tankers
Specialized Training for Chemical Tankers
Specialized Training for Liquefied Gas Tankers
Survey of electrical Installations
Survey of Fire Appliances and Provisions
Survey of Life-Saving Appliances and Arrangements
Survey of Machinery Installations
Survey of Navigational Aids and Equipment
Training Course for Instructors

# Training the trainer

***Captain Tim Wilson***
*Director*
*New Zealand*
*Maritime School*

Should maritime skills be taught by those having experience and expertise themselves? It is a critical question for our industry. Much of the current training around the world, whether done at sea or ashore, already fails to deliver genuinely competent seafarers that can consistently perform at best industry practice standards. Part of the problem is that there are too many trainers with good technical expertise who are incompetent teachers and others who lack the technical expertise to teach.

Notwithstanding, the true extent of the problem is masked by far too many assessment systems that confuse knowledge with competence - I am sure that every reader has personally experienced the problem. Unfortunately, the growing competence shortage in our industry and a failure by many of those purchasing training to adequately discriminate between good and poor training means that the problem will get worse.

Research into vocational education indicates that the best training will be provided by those who have the experience and expertise and who are also good trainers. Anything else is a compromise. Poor trainers fail because they cannot motivate trainees or pass on their expertise and experience in a way that optimises student learning.

Our own experience in introducing non-mariner subject experts in subjects as generic as mathematics invariably led to worse outcomes. Possible reasons for this vary. Trainees are certainly more motivated when the learning is put into context. Further, significant research in other disciplines also suggests that many have real difficulty in transferring learning from one context to another. Regardless of nationality, we tend to respect and relate to other seafarers and to view non-mariners with suspicion. Although perhaps irrational, this means that it is more difficult for non-mariner trainers to gain the respect of seafaring trainees.

Non-mariners may therefore be acceptable trainers but they must have the required technical expertise, they must be able to train effectively and within context, and they must be able to gain the respect of their trainees.

Our strategy, however, should be to only recruit experienced mariners.

# Gaining an understanding of the *'Perils of the Sea'*

***Andrew Easdown***
*Manager,*
*Marine Training Services*
*Lloyd's Register*

One of the difficulties that many marine organisations are facing is the number of surveyors and superintendents coming into the industry from a non-seagoing background. This presents a challenge to organisations that rely on a deep understanding and knowledge of the marine environment and life at sea in particular, as it is very difficult to 'train' in years of experience over a short period of time.

For many years, Lloyd's Register has sent new recruits and particularly graduates to sea for up to three months to act as a supernumerary onboard. This, accompanied by an intensive training programme, where the trainee is exposed to a wide variety of work with people of varied backgrounds and experience, has been a very effective way of developing sufficient understanding of life at sea.

Many of the original 'Surveyors to Lloyd's Register' came from the UK Naval Dockyards with a strong marine background, which did not necessarily include time at sea. By ensuring that the training for new surveyors included periods of time spent with old sea dogs, there was a positive system for ensuring that they would have sufficient knowledge of the sea to enable them to perform their duties efficiently and effectively. This is essentially the system that exists today, whatever the background of our new surveyors.

Many opportunities still exist for surveyors to gain an understanding of life at sea through attendance on sea-trials and by carrying out surveys at sea. During on the job training the power of the sea can be understood by examining its damaging effects on hull structures, particularly during docking and special surveys. By following a planned and pro-active programme of training, including video, formal courses and on the job training, it is possible to pass on experience in a way that enables surveyors to add to their knowledge.

While there will never be a substitute for direct hard earned experience of life at sea, a well thought out system of training can go a long way towards redressing the balance. Companies must establish plans to make the most of the valuable ex-sea going resources that they have within their organisation and ensure that effective knowledge transfer takes place. Positive action is needed to ensure that the next generation of surveyors and superintendents understand the perils of the sea in the same way that seafarers have always done.

*Further information about **Lloyd's Register Marine Training Services** can be obtained from: www.lr.org/market_sector/marine/mts/index.htm*

# Leadership - a training need?

***Philip Wake, MSc FNI***
*Chief Executive*
*The Nautical Institute*

There is no doubt that the shipmaster has a primary leadership role aboard his ship, which requires him to demonstrate the following qualities:

- The ability to build and lead a team
- The ability to be assertive with the crew and outside agencies
- Being fair and consistent
- An understanding of human nature and human limitations
- Being supportive and interested in the crews' personal and professional development
- The ability to give clear and concise orders when necessary

From a legal and practical standpoint, the master must lead his team to ensure that the ship is seaworthy at all times and should apply the ISM Code in a pro-active manner. He must ensure his officers navigate and run the ship in a safe and seamanlike manner, applying best practice at all times. Many of these aspects require technical skills but what binds them all together are people skills and that is where leadership becomes crucial. The master also requires professional integrity before commercial expediency and he will also be helped by a thorough understanding of the shipping business. In short, he must be a leader and set a good example for his crew to follow.

The Nautical Institute's current work on the role of leadership in the safety culture began in 2001 as a result of members' concerns that increasing regulation was developing a 'tick box' mentality rather than a real belief in and knowledge of how to operate safely and efficiently. We identified a lack of knowledge of leadership skills as a major issue in commercial shipping and little awareness of the need for training in this area.

We therefore ran a number of seminars and set up a Working Group to formulate a viable strategy to encourage leadership training in the industry. Their work took into account existing national and international regulations and was influenced by market forces. The Working Group comprised an inter-disciplinary mix of personnel from the ship owning/management, ports, academic, training, and sea-going sectors of our industry with access to information from the main crew supply countries and the principal examination administrations.

Leadership training is essential, as the value of shipping assets, the environment in which maritime people work, the risk/reward ratios, and the expectations of the world community place greater demands on owners, managers and seafarers. Because of this, the shipping industry must focus on the qualities of leadership which it needs to promote, and apply leadership training.

It should also look to identify and train leaders early on in the management process as would any non-maritime business. This early identification of leaders will shape the young people and ensure that the company retains and promotes the right personnel to add value to the business and reduce risk. Quality, safety and success are all tied together; leadership training, therefore, can be seen to be an investment with dollar value, when it reduces risk and leads to a reduction in claims and adverse publicity from accidents.

Some may think that leadership need only be applied by the master or chief engineer and that earlier leadership training is merely preparation for these ultimate positions of responsibility. However, virtually anyone on board a ship may be called upon to be a leader in certain situations. There are some courses that involve leadership - such as firefighting, Crisis Management and Bridge Team Management - but few of these overtly explore the underlying principles of leadership. This is a gap that must be filled to improve the safety and efficiency of shipping.

So what do mariners need to know about to be effective leaders in their demanding environment? We believe the following topics should be included:

- Cultural Awareness & team impact
- Behavioural Models
- Human Limitations including fatigue
- Effective Communication
- Teamwork Principles
- Decision making & problem solving processes
- Personal & professional development
- Coaching & Mentoring
- Appraisal systems and techniques

The Working Group has devised the structure for two 3-day courses - Foundation and Development - which are intended to be the standard for accreditation of leadership training internationally. This is the culmination of two years' work and promotion by The Nautical Institute during which there has been a noticeable increase in the industry's awareness of the need for this type of training.

*For further information, contact:*
***cpw@nautinst.org.***

*A fuller version of this paper can be downloaded from the Alert! website at:*
***www.he-alert.org*** *(Ref: HE00335)*

## Specification of minimum standard of training in leadership for sea and shore staff

| Subject | Content (Knowledge, Understanding and Proficiency) | Methods for delivery of training | Training objectives and criteria for evaluation of successful completion |
|---|---|---|---|
| Cultural awareness | • The links with ship safety and efficiency through the effect on team working and performance.<br>• Cultural differences.<br>• Religious differences<br>• Language difficulties.<br>• Perceptions and expectations relating to authority and status.<br>• Implications of impact on team dynamics<br>• Techniques for managing potentially contentious issues. | • Quiz.<br>• Personal experiences (facilitated discussion).<br>• Case study.<br>• Syndicate exercise. | • Scores recorded on Quiz.<br>• Knowledge improvement action plan.<br>• Behaviour and individual contribution demonstrated in case study exercises. |

Example specification

# Accident Investigation Reports

## Breakdown in team work and communication leads to grounding

*Weaknesses in Bridge Resource Management, training and professionalism are highlighted in this report of the grounding of a 14,440 tonnes displacement passenger ship whilst proceeding out of harbour.*

After the ship left its berth, the master elected to maintain conduct of the ship, without discussing his outward passage plan with the pilot, and subsequently did not accept the advice of the pilot, such that he incorrectly positioned the ship for a turn to starboard into the approach channel resulting in the ship running aground during the turn. The report concludes that the incident was caused, in some part, by the poor interpersonal relationship that developed between the pilot and the master; this was aggravated by a lack of communication, not least because communication between members of the bridge team was conducted in a language unfamiliar to the pilot.

Although there was a suggestion that it was a steering malfunction that caused the grounding, the investigation was unable to determine the degree to which the reported malfunction contributed to the incident. But, the report concluded that the failure of the ship's staff to notify any marine authorities, the pilot or the classification society about the steering malfunction raised issues about the credibility of the claim, and that the handling of the matter pointed to a lack of professionalism on the part of the ship's staff.

The investigation was hindered by the lack of information from the Voyage Data Recorder (VDR) which had not been backed up immediately after the grounding (highlighting a deficiency in crew training) and by the fact that company procedures were not followed with respect to the keeping of bridge records.

The report recommends that:

- *Ship owners, managers, operators and masters of ships ensure that all bridge staff are fully trained in the correct operation of VDR data backup procedures for the particular ship on which they are serving.*
- *Manufacturers of VDR units ensure that indicator lights are free of any possible ambiguity and that consideration be given to printing emergency back-up instructions on VDR control panels on ships' bridges.*
- *Masters should not actively con the ship during pilotage unless they are familiar with the port and they do so in full agreement with any pilot.*
- *Masters should ensure that all bridge orders in pilotage waters are in a language understood by pilots and ships' staff.*
- *Ship owners, managers and operators instruct masters and ships' crews to use all elements of effective Bridge Resource Management at all times.*

The full report can be can be downloaded from the ATSB website at:
*www.atsb.gov.au/marine/incident/incident_detail.cfm?ID=200*

# Reports & Studies

### ISSUES TO BE CONSIDERED WHEN INTRODUCING NEW TECHNOLOGY ON BOARD SHIP

While the introduction of new technology on board merchant ships has the potential to improve the efficiency and effectiveness of watchkeeping and to improve the safety of operations, this technology brings with it the inherent training requirements needed to be able to physically operate the new systems and also the training needed to allow seafarers to use the systems to make better decisions. Standardization of designs is necessary to create an environment where seafarers and pilots, working within the natural constraints of their trades, can operate the systems safely and effectively.

This important document seeks to draw to the attention of *seafarers, shipowners and managers, equipment manufacturers, regulators, and trainers,* to the various issues to be considered for the training of seafarers when introducing new technology onboard ship. It contends that training for the use of such systems should take into account the special human element issues associated with the human machine interface, the recognition that automation changes a task it was meant to support, and that operators will monitor less effectively when automation is installed.

*(IMO MSC/Circ.1091 dated 6 June 2003)*

*The document can be downloaded from the IMO website at:*
*www.imo.org/includes/blastDataOnly.asp/data_id=7578/1091.pdf*

### MARITIME PROFESSIONALS AND THE ROLE OF QUALIFYING ASSOCIATIONS

Shipping like other transport industries requires watchkeepers, pilots, and drivers to be certificated to governmental standards. The reasons are twofold. First, society demands a competent level of capability amongst those in control of vehicles whether on land at sea or in the air, because of the serious dangers if they are in the hands of incompetent people.

Secondly the licensing system enables administrations to exercise control of the standards and to withdraw licences in the event of improper conduct with the protection of legal immunity.

In other professions like law, medicine, and accountancy, standards of competence are set by professional bodies. Professional associations further require continuous professional development to keep their members up to date

Certificates of competency for seafarers provide a good level of education and a test of capability in the areas of governmental responsibility as outlined in STCW 95. Some governments, through their education departments, augment the international standards, and some do not.

Certificates of competency, whilst providing a recognised standard in the shipping industry, do not in themselves lead to a dialogue with the other professional disciplines. For this to happen there needs to be a link between the professional associations of the naval architectural, nautical, engineering and broking fraternities.

In this comprehensive paper on The Role of Professional Associations in Shipping, Julian Parker examines the positive value of qualifying associations particularly in the field of operational design and interdisciplinary cooperation.

*(Julian Parker, OBE, FNI, The Nautical Institute)*

*This paper can be downloaded from the Alert! website www.he-alert.org (Ref: HE00340)*