INTERTANKO

Tanker Officer Training Standard (TOTS)

Frequently Asked “TOTS” Questions

Poseidon Challenge

The Nautical Institute

Institute of Marine Engineering, Science & Technology

IMAREST

TOTS: An Introduction

Executive Summary

TOTS – Tanker Officer Training Standards – is intended to provide the tanker industry with a standard that ensures tanker officer competence through onboard and shore training, evaluating "time in rank" and "time with company" and also easing the problems and difficulties that tanker owners are encountering with the different "officer matrix" requirements of certain charterers. Importantly, TOTS also aims to address the current increasing trends in tanker accidents.

Historical Background

A number of oil companies have in place their "Officer Matrix" requirement based on two elements: "time in rank" and "time with company". These requirements have grown out of the perception that officer competence across the tanker industry does not universally meet with some charterers' expectations for experience in rank and familiarity with their company operating and ISM systems. This perception is fuelled by the trend of increasing tanker accidents.

As a result, tanker owners are increasingly finding themselves subject to "time in rank" and "time with company" requirements which are competing and contradictory, and which can be difficult to comply with.

INTERTANKO's Tanker Officer Training Standards (TOTS), aims to provide a coordinated response from INTERTANKO by establishing a set of voluntary Tanker Officer Training Standards for INTERTANKO members, which, when complied with, will ensure tanker officers' competence for shipboard operations in addition to specific tanker types such as Crude, Product and Chemical tankers. The aim is that this will be accepted as the norm of a competent tanker officer and provide alternative measuring tools for "sea time" or "calendar years" for both "time in rank" and "time with the company". The TOTS system aims to provide a level of comfort to those oil companies that utilise officer matrix requirements and will ease compliance with them.

TOTS: The Concept & Implementation

The TOTS system has been fully endorsed by INTERTANKO's Council and is currently on schedule for release in April 2008.

TOTS aims to:

- Provide competency training and verification for tanker officers
- Show how it can be built around what exists today
- Show how it will fill the gaps that exist with regard to "experience" and how this can be improved and how alternative systems can be used as a measuring system other than the use of "time".
- Show the overall concept and outline how it fits into TMSA and how TMSA can be used as part of the verifying process.
- Indicate that TOTS is a system over and above the STCW requirements, and demonstrates that TOTS does not duplicate or replace the IMO tanker familiarisation model course or the IMO tanker endorsement in any way, or any other training requirements.

It is recognised by INTERTANKO that it is important that we gain support from all parties (most importantly the oil companies), and cooperate with them to ensure we gain acceptance of the TOTS system; that TOTS is seen as "additional" to what exists today; that TOTS will meet oil company requirements and expectations and will provide an alternative tool to measure "time in rank" and "time with company". We believe that linking TMSA with TOTS will play an important role in this process. However the acceptance of TOTS as an industry standard will predominantly be dependent on how robustly the TOTS system is implemented by each company and on the controls that each company has in place to ensure compliance with the TOTS standard.

INTERTANKO believes that the system demonstrates that TOTS can offer additional value. It will fill the experience gap which exists and also provide a system of "verification of experience for each officer".

Being able to demonstrate, both at the training and verification levels, that TOTS is robustly implemented will be critical to the success of TOTS. The system provides tools to achieve this and also to verify that the candidate achieves the required level of experience at each stage. In order that the system will be robust and will provide real value to the industry, TOTS provides a systematic method of acquiring specific experience in different ranks and includes a method of verifying that experience. This addresses the current "lack of compliance with rules and regulations" via the Human Element aspects of the TOTS system, whilst also providing a training system that will provide sound technical knowledge and competency.

The TOTS pictogram (see below) is divided into the 4 TOTS sections which are explained later, but also provides an overview of the statutory training requirements regarding The Tanker Familiarisation Training and Tanker Endorsements Requirements in order to indicate that TOTS is not a duplication of this or a replacement for the statutory training requirements.

It is important to understand that TOTS is a voluntary system, and it is up to each individual company to decide which of its officers should undertake, or need to undertake, training in the TOTS system. However if a company has a senior officer, who is experienced both in rank and in time with the company, and who meets charterers' requirements, and has demonstrated to the company from his past and current experience that he has the levels of knowledge and safety compliance required, then there would be less value in that officer undertaking the TOTS training system.

Where the TOTS system specifically aims its efforts is as follows:

- New junior officers;
- Preparing senior cadets for their first junior officer position
- Existing junior officers aspiring to senior officer positions;
- Newly promoted officers who will benefit from the additional training
- Officers which are new to the company (specifically undertaking module 1D "Time with company").

It is recognised that some companies will operate systems which are either similar to the TOTS standard; or are similar to the TOTS standard but utilise different systems to attain the TOTS standard; or already incorporate some but not all of the elements of the TOTS standard. In such cases it is not envisaged that a company would need to totally

change its existing system, or the elements that it already utilises, if its existing system meets parts of the TOTS standard. Specific elements may be utilised so that the overall TOTS standard is achieved by the company, but it would be expedient for the company to be able to demonstrate that its standard is equivalent to the TOTS standard. It should also be recognised that TOTS is developed with the view to being a minimum standard, (albeit above the STCW requirements) and a company may exceed the TOTS standard, or utilise those sections that it may require in order to meet the overall TOTS requirements of the standard.

We believe that by ensuring that TOTS meets some of the associated TMSA elements contained in the "Recruitment and Management of Vessel Personnel" and "Navigational Safety" sections of The Tanker Management and Self Assessment 2nd Edition (TMSA 2), this will be beneficial for all concerned as it will ensure the same degree of attention to detail and verification by the company as with all other elements within TMSA. It is hoped that a self-auditing company system of verification of TOTS linked to TMSA will provide an over-arching additional verification process which, in turn, will ensure a systematic undertaking by the company to ensure TOTS is implemented as intended.

TOTS: Goal & Objective

This is a detailed system built on the initial concept outlined previously.

INTERTANKO's Tanker Officer Training Standards (TOTS) aims to provide a coordinated response by INTERTANKO, by establishing a set of voluntary Tanker Officer Training Standards for INTERTANKO members, and others which, when complied with, will ensure tanker officers' competencies for ship board operations and specific tanker types such as crude, product and chemical tankers, via a core competency based training system through a practical, experience-based authenticated, assessed and verifiable system, over and above the current minimum requirements. The aim is that this will be accepted as the norm of a competent tanker officer within the industry, and will provide alternative measuring tools to "sea time" or "calendar years" for time in rank and time with the company. The TOTS system aims to provide a level of comfort to those oil companies that utilise officer matrix requirements and ease compliance with them.

Elements 1, 2, 3 & 4 Explained

(Element 1) Time in Rank: Modules 1A, 1B, 1C

Definitions for the purpose of TOTS:

- The "Candidate": Is the Officer who has being assigned the training record book.
- The "Authenticating Person": Should be either the master or the company training officer.
- The "Supervising Officer/Instructor" Should be either a senior officer onboard or the training officer

There are 3 detailed "Time in Rank Modules" which are training record books which include various elements, both tanker specific and non-tanker specific. Each record book is designed to incorporate tasks and questions that need to be signed off by the authenticating person. These tasks should be coordinated, controlled and verified by the company. Each record book is designed for a specific level of rank and discipline.

The three training record books are as follows:

- 1A Command Module, Master and Chief Officer
- 1B Senior Engineering Officer Tanker Module
- 1C Junior Deck & Engineering Officers Module

These record training books are officer specific as they address time in rank and thus will follow the candidate even if he changes companies.

The candidate must complete the "Particulars of Trainee" section and affix a clear passport style photograph of him/her self where indicated. The candidate is also responsible for ensuring that the "shipboard service record" is completed according to the dates recorded in his/her seaman's discharge book, and for completion of the particulars of ship section for each vessel sailed on.

The candidate must sign the "Candidate's Affidavit" to confirm that he/she has personally completed the work and CBA requirements within the record book.

The "Authenticating Person" (and this will vary from ship to ship) must sign section 13 of the record training book confirming the candidate has completed each specific CBA test. However, each authenticating person "must" sign the "Authenticating Person's Affidavit"

Training record books 1A, 1B and 1C contain general shipboard sections, safety environmental sections, tanker operation sections, navigational, engineering and safety sections. Each task has provision to be assessed twice. If the candidate completes the task or demonstrates the required level of knowledge to the entire satisfaction of the Supervising Officer/Instructor associated with that task, then the supervising officer/instructor may sign both columns 1 and 3 associated with the task, to indicate the task as satisfactorily completed.

However, if after the initial assessment the supervising officer/instructor finds that the candidate requires further improvement in specific areas associated with the task, then the supervising officer should only sign column 1 and indicate in column 2 which the areas for improvement are. The company may then decide that the candidate should undertake additional training in that specific area - for example additional Computer Based Training (CBT) relevant to that section, or a training course or some form of in-house training and/or onboard familiarisation as appropriate. Where any such additional CBT, training course, or familiarisation programme is undertaken, this should be recorded in section 14. The candidate should then be re-assessed against that specific task and, if completed satisfactorily, then and only then should the task be signed off as fully completed (in column 3).

Each of these training record books contains 3 different tanker type supplements as follows:

- Chemical Tankers
- Product Tankers
- Crude Oil Tankers

The candidate need only complete the tanker supplement appropriate to the type of tanker upon which he/she is sailing or intends to sail.

(Element 1) Time with Company: Module 1D

There is 1 generic training record book that covers time with company as follows:

- 1D All Officer Module "Time With Company"

This training record book (1D) will only remain "valid" whilst the candidate is serving with that company. If the candidate changes companies then the candidate will have to under go a new "Time with Company" training record and verification process with that new company.

This record book is in the form of a template which is available in an editable format for the company to download if it wishes. Although each company has a fully implemented ISM system, operating systems and security plans and arrangements, this is obviously unique for each company. Module 1D provides the minimum requirements with which the company should ensure each officer is fully conversant. But each company will need to expand and customise this module to meet its own particular needs whilst covering all the elements contained in 1D.

(Element 2) Computer Based Assessment (CBA)

The Computer Based Assessment (CBA) will be delivered via a CD-ROM, and all assessment tasks will be contained on this CD-ROM which will be included with every training record book. When a section of the training record book has been completed, the user will be required to complete the assessment on the CD-ROM for that section, to print out his/her certificate, and to ensure that the authenticated person logs and signs completion of the activity and assessment in his/her training record book. The CBA will not cover the tanker supplements as this will be verified by the simulator sections of TOTS in element 4.

When all sections and assessments have been completed the user will be required to complete a final assessment. This final assessment will be sat under exam conditions either onboard or ashore in the company. This CBA assessment is on a separate CD-ROM which will be either held by the Master or in the office.

When the candidate starts the CD-ROM they will be asked to select the module they are taking (1A, 1B or 1C). The candidate will then be presented with the list of assessments

available in that module. When an assessment is started it will pull a set number of questions randomly from the databank. As each question is answered the candidate will receive partial feedback (they will be told if they got the question right or wrong, but not the correct answer) to reaffirm acquired knowledge and highlight areas of weakness for further self-study. There will be no limit to the number of times the user can sit the assessment, but both the candidate and the authenticated person will be required to sign an affidavit to confirm that the candidate personally sat each CBA when completed.

(Element 3) Company Based Assessment

Upon completion of Module 1D the company is to ensure that each officer undergoes verification. This may be via a CBA system developed by the company which will ensure the candidate is fully conversant with the company's systems. Records of such training and the individual's verification process should be retained for audit purposes. However, as a company-based system, it remains important that there is a verification process involved that will over-arch the "Time with company" elements to ensure a uniform system of implementation and application and that the system is fully implemented and robust within that company.

(Element 4) Simulator Training & Verification

There are 6 simulator modules attached to the TOTS system which are outlined as follows:

Tanker Type Simulator Training Modules 4A, 4C & 4E

The deck officer candidates either at the junior officer level or command module level, as appropriate/necessary, will be required to attend an externally auditable maritime training centre, upon successful completion of the appropriate tanker type supplement, i.e. the chemical, crude or product, and to undertake the simulator training course for the type of tanker upon which he/she will sail. There are three simulator training modules in the TOTS system:

- 4A Chemical Tanker Simulator Training Course
- 4C Product Tanker Simulator Training Course
- 4E Crude Oil Tanker Simulator Training course

Each module will complement the tanker supplements in the record training books and ensure the candidate acquires “hands on” experience to build on the knowledge gained in element 1. Having completed the appropriate simulator training course it is however expected that the candidate will attend at a later stage to complete the appropriate tanker type simulator verification course as part of the verification process of assessing proficiency of knowledge at the senior level.

These modules are simulator models which determine the standard to be attained through the simulator training course, and it is expected that the externally auditable maritime training centre which runs these courses will ensure it attains the standard that the models set out - and that it can demonstrate this.

Tanker Type Simulator Verification Modules 4B, 4D & 4F

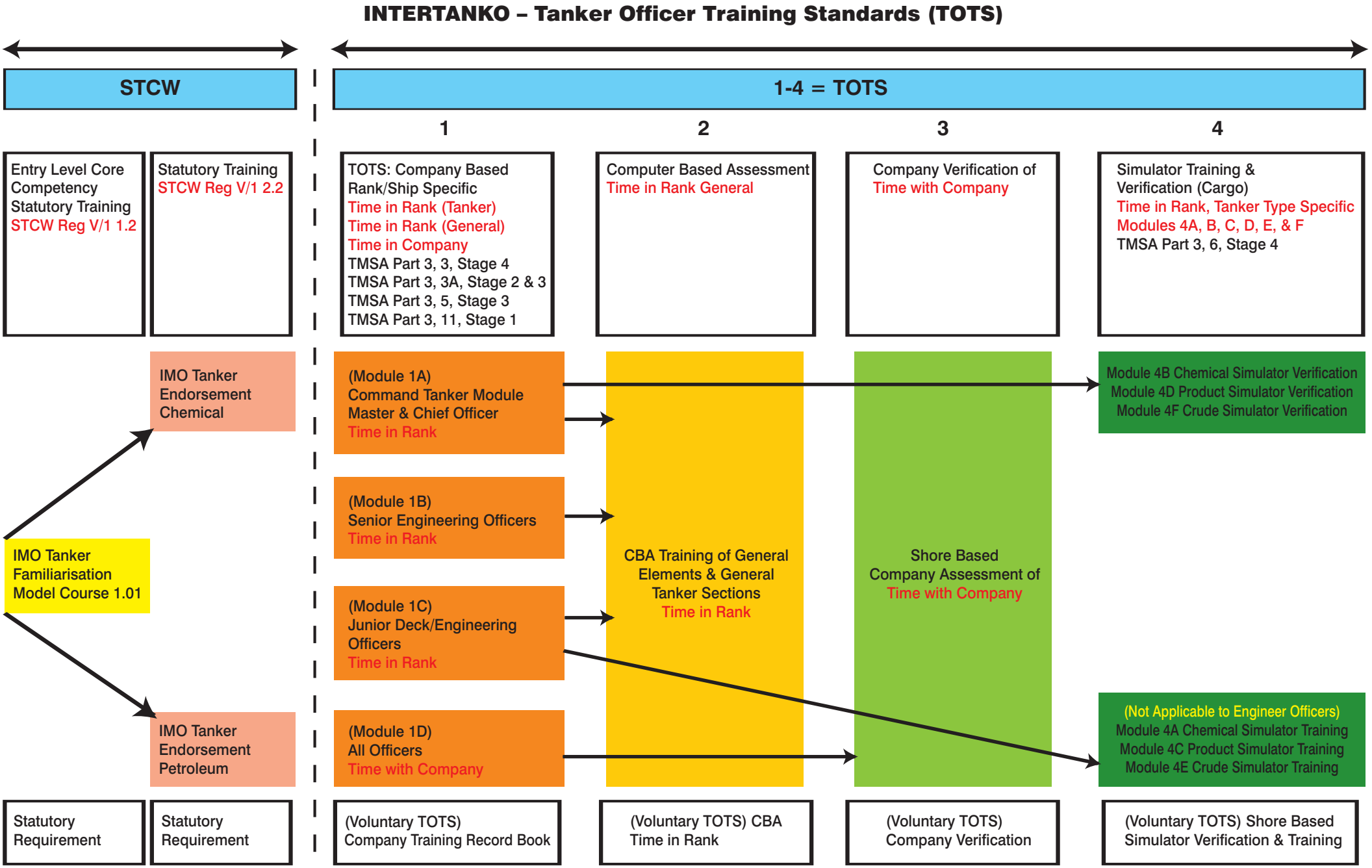
The deck officer candidates, who undertake the command module (1A), will be required to attend an externally auditable maritime training centre, upon successful completion of the appropriate tanker type supplement, i.e. the chemical, crude or product, and to undertake the simulator verification course for the type of tanker upon which he/she will sail. There are three simulator verification modules in the TOTS system as follows:

- 4B Chemical Tanker Simulator Verification course
- 4D Product Tanker Simulator Verification course
- 4F Crude Oil Tanker Simulator Verification course

Each module will complement the tanker supplements in the record training books and ensure the candidate is assessed of his “hands on” experience to build on the knowledge gained in 1A.

These modules are simulator models which determine the standard to be attained through the simulator verification course, and it is expected that the externally auditable maritime training centre which runs these courses will ensure it attains the standard that the models set out – and that it can demonstrate this.

The following pictogram provides an overview of the system as explained above.



Frequently Asked "TOTS" Questions

What does TOTS stand for?
Tanker Officer Training Standards

Why did INTERTANKO produce TOTS?
A number of oil companies have in place their "Officer Matrix" requirements based on two elements: "Time in Rank" and "Time with Company". These requirements have grown out of the perception that officer competence across the tanker industry does not universally meet with some charterers' expectations for experience in rank and familiarity with their company's operating and ISM systems, This perception if fuelled by the trend of increasing tanker accidents. As a result, tanker owners are increasingly finding themselves subject to "time in rank" and "time with company" requirements which are competing and contradictory, and which can be difficult to comply with.

How did INTERTANKO produce TOTS?
Following extensive review of the issue by the INTERTANKO Vetting Committee, (Chaired by Capt. Bob Bishop: CEO V.Ships), it was agreed that an alternative method of measuring experience should be developed by INTERTANKO to address "time in rank" and "time with company", other than using time as a measure of a tanker officer's individual experience.

The matter was reviewed jointly with INTERTANKO's's Human Element in Shipping Committee (HEiSC), (chaired by Mr Amir Azizan President & CEO of AET Tankers Group of Companies) and, following endorsement by INTERTANKO's Council in March 2007, it was agreed to form a joint working group of the two committees in order to best develop the TOTS system by utilising the resources and expertise of specific committee members and associated staff from their respective companies.

The concept was developed by this joint working group consisting of the following participants and companies:

Name	Company Name
Working Group Chairman:	
Capt Rajalingam	AET Ship Management (Singapore) Ltd
Capt Vishal Singh	V.Ships
Capt. Steve Hardy	Interorient Marine Services
Mr Dimitrios Stamoudis	Minerva Marine Inc.
Mr. Roel Vermeulen	Broere Shipping BV
Mr Jean Nectar	Brostrom Tankers SAS
Capt Andy Hill	MOL Tankship Management (Europe) Ltd
Capt. Anuj Chopra	Anglo Eastern Ship Management Ltd
Mr John Adams	Teekay Shipping (Canada) Ltd
Mr Lau Seng Chuan	Malaysian Maritime Academy
Prof. Mike Barnett	Warsash Maritime Academy
Mr Andy Muir	MARLINS
Capt Howard Snaith	INTERTANKO Marine & Chemical Director
Mr Fredrik Larsson	INTERTANKO Marine Manager
Mr Ajay Gour	INTERTANKO Chemical Manager

What's the objective of TOTS?
INTERTANKO's Tanker Officer Training Standards (TOTS), aims to provide a coordinated response by INTERTANKO by establishing a set of "voluntary" Tanker Officer Training Standards for INTERTANKO members, which, when complied with, will ensure tanker officers' competence for rank-specific shipboard operations as well as for specific tanker types such as Crude, Product and Chemical tankers – and as well as for specific company operating systems. The objective is that this will be accepted as the norm of a competent tanker officer and provide alternative measuring tools to "sea time" or "calendar years" for both "time in rank" and time with the company".

When will TOTS be available?
The current launch date is the 22nd April 2008, post endorsement by the INTERTANKO Council meeting, during our Annual Tanker event in Istanbul.
www.intertanko.com/tankerevent
www.poseidonchallenge.com

How long did it take to produce TOTS?
13 Months.

Will TOTS replace the Officer Matrix requirements?

The intent of TOTS is not to replace the officer matrix requirements but to ease compliance with these requirements, by offering a structured, controlled auditable process to ensure enhanced competency training and an understanding of compliance with today's rules and regulations.

Will TOTS be accepted by the Oil Companies?

INTERTANKO anticipates that the amount of easing compliance that will be attained with any of the existing officer matrix requirements will probably be based on a one-to-one basis between the individual shipping company and the oil company concerned. It will include various factors that will be assessed by the oil company, as may be determined by the oil company, but not least how robustly the TOTS standard and associated verification process is implemented by the shipping company, and probably the amount of evidence that the shipping company can produce to demonstrate that TOTS is robustly implemented. In essence, the aim is to provide a comparable level of comfort that the team onboard will operate the tanker in a safe and environmentally conscious manner.

Will TOTS replace my existing officer competency training system ?

The intent of the TOTS system is to produce a stand-alone standard in excess of STCW. TOTS stands for "Tanker Officer Training Standard" and thus whilst TOTS is produced as "The Standard" it is a voluntary standard and not intended to replace or duplicate anything which is already exists in each company - if what exists in a company already meets the TOTS standard. As a consequence, a company may use the systems it already has (if they meet, or indeed exceed, the TOTS standard).

Will TOTS be referenced to TMSA 2?

TOTS will be TMSA 2 compliant, such that the references to the TMSA sections in TOTS are referenced and applicable to TMSA 2. We are very grateful to OCIMF for facilitating this in advance of the release of TMSA 2.

As TMSA is referenced into the TOTS system, users should be aware that oil companies who do undertake TMSA office audits will probably be comparing these elements of the TOTS system against the TMSA applicable elements. The TOTS system is an auditable system and provides an auditable tool to check that the TOTS elements, and specifically the TOTS verification elements, are adequately controlled by the company.

Will all tanker officers have to undertake TOTS?

No, not at all, where TOTS specifically aims its efforts is as follows:

- New junior officers.
- Senior cadets in preparation for their first position as a junior officer?
- Existing junior officers aspiring to senior officer positions;
- Newly promoted officers
- Officers who are new to the company (specifically module 1D "Time with company").

What if the candidate changes companies?

The time in rank elements will transfer with the individual candidate as this is his own personal experience record. However, the time with company training book is unique to the company and therefore if the candidate changes companies then the candidate's "time in company" book will need to be repeated with the new company.

How many ships will the candidate need to sail on before completing the TOTS record book?

Although the record training books contain records for 4 ships, the time required will be up to the individual candidate, as some will require more time than others. Also some will be on deep sea voyages and some will be engaged in the short sea trade and thus there is no single specific length of time, or number of ships. This will depend upon each individual's skills and sailing patterns and level of achievement.

How robust is the verification processes in the TOTS system?

The verification elements in TOTS are as robust as possible, as it is not be possible to build a competency training system which is totally unique to each company. However, the integrity of the implementation of the system will largely depend on each company to ensure that the TOTS system and its associated verification processes are adequately implemented, and it will depend upon each individual company to give a strong lead to ensure proper implementation - and to be able to demonstrate this.

Will TOTS be submitted to IMO?

Once TOTS is released the intention is to submit TOTS to the IMO as an information paper only, simply to bring it to the attention of the IMO and member Governments and Non Government Associations.

Does TOTS address the Human Element?

Yes, the human element is fully addressed in both the time in rank modules and time in company modules. The time in rank manuals address this by requiring that a Crew Resource Management Course is undertaken, by an externally auditedable maritime training centre. The main aspects that are addressed by these courses include:

- Situational awareness
- Planning & decision making
- Communications
- Teamwork

- Emotional climate
- Stress
- Managing stress
- Commercial, organisational pressures & morale
- Fatigue

The time in company manual addresses the human element through its occupational health & safety aspects

How will areas of improvement be addressed for the candidate?

If the candidate is assessed as requiring specific area(s) that require improvement then the tools for identifying this are built into the TOTS system. There is a facility in the record books to identify this. In such cases it would then be the responsibility of the individual company to ensure that the candidate's knowledge and understanding is improved and then re-assessed to confirm this and recorded in the TOTS training book.

Will there be a pass mark for TOTS?

Yes, and the tools are provided within TOTS to be able to assess each candidate. But it will be up to the individual company to assess the level of achievement required within each CBA and the final CBA, and also to assess the training manuals as well as the simulator verification courses, to determine the acceptability of the candidate within his/her own company's requirements.

Will the Computer Based Assessment (CBA) elements be different between large and small tankers?

The CBA will be based upon the training record books and is generic for all sizes of tankers. The TOTS tanker type supplements for Chemical, Crude and Product tankers contain specific questions relating to the specific ship type.

Will the CBA assessments be undertaken by "closed book" or "open book" exam?

There will be no limit to the number of times the candidate may undertake the section CBAs associated with the training record books. However the final assessment CBA must be completed under exam conditions (closed book) in order to ensure the assessment system is robust.

How long will each CBA take to complete?

Approximately 1 hour

How many CBA assessments are there in each training record book?

The training record books contain the following number of CBA assessments
Module 1A – 18 Assessments
Module 1B – 22 Assessments
Module 1C – 17 Assessments

How large will the total CBA question database be?

It is expected that the question database will be in excess of 2,000 separate questions.

What is an "Externally Auditable Maritime Training centre"?

This is a maritime training centre that can demonstrate that it runs and operates its TOTS simulator training & verification courses to the TOTS standard.

Will the Maritime Training Centre pass or fail the candidate after completing the tanker specific simulator verification course?

The maritime training centre will provide the shipping company with an assessment of the candidate's performance upon completion of the simulator verification course. But it will be up to the shipping company to determine the acceptability of the candidates within its own company requirements.

How long will the simulator training and verification course take?

The training simulator course will take about 4 and a half days and the verification course will take about 3 days.

Will the TOTS simulator models be able to be utilised by any maritime training centre?

As long as the maritime training centre is externally auditable; utilises simulator equipment recognised by an acceptable standard; runs the simulator courses to the TOTS standard, then such courses can be undertaken around the world.

Will the simulator models be flexible so that "faults" can be simulated and controlled in the exercises?

Yes, the simulator models are specifically designed with this in mind.

My company has transferred me from the bulk carrier fleet to the oil tanker fleet. I have completed the familiarisation courses for the specific tanker type I shall be working on. I have ten years' sea-time as a marine engineer in various ascending ranks and my last position was as Second Engineer for three years. How should the company

blend me into the TOTS system?
It is up to the company to assess how best to achieve this, but the system allows for you to commence with the TOTS Training Record Book 1B for Senior Engineers (Chief and 2nd Engineer).

Our product tanker fleet has recruited a new Master who is a veteran from an oil tanker company. He has more than ten years' experience as Master with the old company. We intend to put him on board our new product tankers. What should our company do according to the TOTS system?
It is up to the company to assess each circumstance on a case–by-case basis, and the company may find value in sending the officer on the Simulator Verification Course. If the officer meets charterers' requirements for "time in rank", there will be minimal value in the officer undertaking the "time in rank" training and assessment. However, as the candidate is new to the company, there will be maximum value in the officer undertaking the "time with company" training and assessment elements.

Our company has sponsored a few cadets (engineer and deck) who will work with us for about ten years after graduation. They will shortly be embarking on their sea training on our tankers. During their sea-time, they will be completing their own cadets training record book. Do they still need to use the TOTS Record Books?
TOTS is a voluntary system so it is not necessary, but towards the end of their cadetship they may find value in undertaking some of the elements of the Junior Officer Training Record Book (1C) prior to their first position as a Junior Officer.

I have just graduated from a maritime academy and I hold a Watch-Keeping Engineer certificate issued in accordance with STCW. My cadet sea-time was performed in a non-tanker company. I shall be joining a product tanker company as a junior engineer officer and hope to benefit from the TOTS system. Please advise which record book to use.
The correct TOTS record book to utilise is the Junior Officer Record Training Book (1C), but, as indicated in the book, only the engineering sections will apply.

I have just passed my Class 2 certificate of competency as a Marine Engineer Officer. My last position was as Third Engineer. My total tanker time is five years in chemical tankers, of which two years were spent as Fifth Engineer and three years as Fourth Engineer. I am due to be promoted to third engineer. Please advise which record book to use as I have not used any TOTS Record Book so far.
The correct place to enter the TOTS system will be by using the Junior Officer Record Training Book (1C), engineering sections only, and advancing to the Senior Engineering Officer Module (1B) in due course

Will TOTS only be available to INTERTANKO members?
TOTS is produced primarily to assist INTERTANKO members as one of the many benefits of membership, but the system will be available to non-INTERTANKO members should they wish to use it.

We are a Maritime Training Centre. Can you advise what "externally auditable" means for us?
If the maritime training centre that is running the TOTS simulator courses has been audited by an external body against the TOTS simulator courses' standard, then this would meet the criteria of externally auditable.

How do I obtain copies of the TOTS Record Training Books and Simulator Modules?
The primary contact for these is MARLINS who may be contacted at:
MARLINS, 1st Floor, Skypark, 8 Elliot Place, Glasgow G3 8EP, UK
http://www.marlins.co.uk/

For further information, or if you have any further questions, please contact:-

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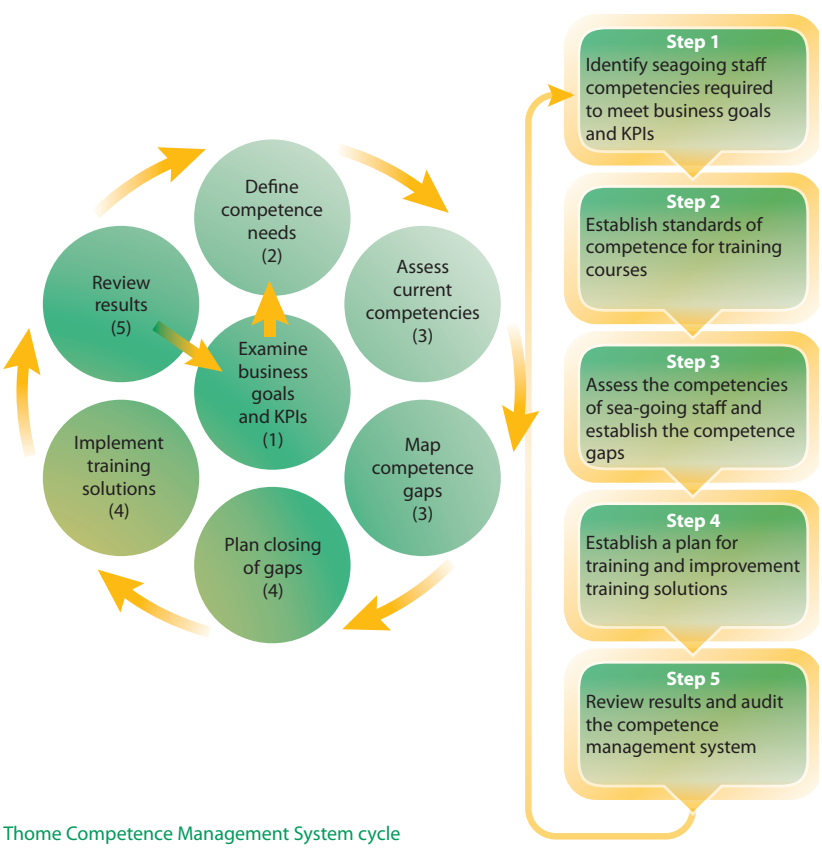
Competence Management is vital in the pursuit to reduce the risk of human error and companies must have the ability to identify, define, develop and improve the competence of seafarers, and those supporting them ashore, in accordance with mandatory requirements, customers' needs and expectations and the company's own defined business goals.

The aim must be to create expert level decision makers, which requires an individual to constantly engage with unfamiliar scenarios and tasks just beyond current levels of performance and comfort, with the guidance of teachers and coaches who can provide the individual with the feedback needed.

A number of different Competence Management systems have been become available in the market over time to assist the development of seafarers in a more structured way. For example, Intertanko has developed the Tanker Officer Training Standards (TOTS), and the Society of International Gas Tanker & Terminal Operators (SIGGTO) has its own competency requirements embracing the ship/shore interface. Thome Ship Management has, since 2010, been using a DNV developed Competence Management System (known as CrewPETS), which also incorporates the TOTS and SIGGTO requirements.



Thome Competence Management System cycle

The system has a number of purposes:

- To provide management with a systematic approach to competence development with regard to economy, efficiency, and effectiveness;
- To support management in the identification, implementation, administration, monitoring, and evaluation of competence development, education, and training to achieve the stated business objectives of the group;
- To reinforce the group's commitment to Quality and its compliance with the requirements of international conventions, national legislation, and relevant industry standards;
- Setting the standard of performance for each rank in terms of knowledge, understanding, application, integration, and psychomotor skills;
- Setting a standard method of assessment of current competence;
- Planning, implementing, and monitoring competence development activities and their effectiveness;
- Documenting career development;
- Clearly defined promotion requirements;
- Structured personal training programmes, based on gaps;
- Personal participation in career review and planning for the future.

We have used our experience in the marine industry, together with that of inspections, audits, and incidents and combined this with our own business KPIs to enable us to develop the standards and elements.

There are approximately 200 competence standards per rank and some of the elements are rank specific for the type of vessel an officer is currently serving on. To complete all elements officers will need approximately 12 months in rank onboard. But, an officer cannot fail an assessment as only 3 grades are used: 'excellent', 'good' or 'training required'.

The Thome Competence Management System is the most comprehensive framework developed to handle competencies and to assess the gap between actual competencies measured and those defined.

For further information about Competence Management Programmes go to **Alert!** Issue No.20, page 3: www.he-alert.org/documents/bulletin/Alert!_20.pdf

Are your seafarers competent?

John Douglas, DNV SeaSkill

Competence is strategically important in meeting corporate business goals whilst also being a key driver to being more responsive to current and future labour markets. In DNV we adopt some basic principles:

- The management of competence is seen as a system that can be measured and audited;
- Competence needs to be linked to corporate business goals;
- Standards are an essential 'yardstick' for measurement whether for management systems, simulators, courses, training performance or competence standards for seafarers in specified operations;
- Measurement of competence through reliable assessment procedures and methods is a way to ensure competence standards are attained and retained;
- The outcome of training actions should be evaluated against business goals.

The value of adopting a systematic approach based on standards is clear. It becomes a differentiator in the market place and enables ship-owners to respond clearly to vetting agencies and charterers on competence issues. Adopting standards of competence harmonises the quality of training actions so that seafarer competence becomes uniform and efficient.

It is essential that the competencies required to meet business goals and Key Performance Indicators (KPIs) are identified. Shortfalls in meeting KPIs are often related to lack of competence, and accident/incident reports may indicate where lack of competence is conspicuous. A standard of competence is the basis for performance criteria to assess the competency of seafarers and staff. As 'sea-time' will always be insufficient, objective testing of competence in an environment as realistic as possible appears more viable - keeping in mind that testing competence against standards can be accomplished both at sea and in simulated environments.

A comprehensive programme of assessment onboard ship by qualified assessors can identify where there are competence gaps when measured against the standard. To conduct such an assessment requires that the assessor is trained to conduct the testing. Utilising personal competence record books derived from the standards has many advantages here. Training need is then highly focused on the identified competence gaps derived from the standards of competence which in turn are related to business goals and KPIs.

A training strategy sets the way training will be conducted. It needs to be flexible enough to cope with the competence demands of the market yet reliable enough to produce consistent quality learning outcomes. In the present economic climate would an emphasis on the leverage of technology and alternative training modes reduce costs and retain quality?

The importance of assessment in the learning process needs to be realised. Whilst measurement of processes against standards such as simulators and courses is important it is the assessment of competence after learning that is crucial.

The only way to ensure that training has resulted in performance improvement is to measure the business effect. Changes in KPIs that can be attributed to improved performance of the seafarer through training and coaching then demonstrate the value of a systematic approach to competence management and finally safe and efficient operation of ships.

www.seaskill.com

Does eLearning Work? It's Time to Put This Question Behind Us

Murray Goldberg

As a former academic, I have always been taught to look at any new information with a critical eye. Not critical in the negative sense, but in the sense that it is important to question everything and take nothing for granted. However, once a question has been carefully analysed and a reliable answer has been found, it is time to use this new knowledge as a foundation to begin asking the next series of important questions. Otherwise, we are stuck perpetually revisiting questions we already have answers to, and progress (i.e. continual improvement) is stymied.

Knowledge is Power (and Progress)

This is the current situation in some parts of the maritime industry surrounding the question of whether eLearning works. To illustrate, earlier this week there was a familiar discussion on a linkedin maritime group debating whether eLearning “works”. Arguments on both sides often cited personal experience or that of colleagues - anecdotes and opinions offering conjecture on topics for which we already have solid answers informed by real research. This made me realize that we need to disseminate more broadly what is already known about this question. This way, the maritime community can move on to the truly unanswered important training questions which need attention. Questions like how to best blend learning experiences, how to cross cultural and language barriers in training, and how to enable vessel operators with tight budgets to instill a culture of safety and make the most of their training opportunities.

To that end, this article will revisit the topic of whether eLearning works. If you already know it works, you can stop reading here - I have said most of this before. However, if you are skeptical, even a little, I encourage you to read on. It is my hope that once you have seen the compelling evidence, we can count you among those that use this knowledge to contribute to the discussion of pressing yet unanswered questions critical to the future of training in the industry. At the very least, it will give you some facts to refer to next time you encounter a statement along the lines of “eLearning can’t work in the maritime industry”.

Let’s start with some quick answers and then present some of the most compelling evidence.

The Quick Answer

Does eLearning work? The answer is “yes”. But that is not enough of an answer. Like any complex topic, there are many parts to that answer. And the more that we understand those parts, the better was are equipped to use the tools (eLearning in this case) in a way that exploits their strengths and accommodates their limitations. So here are a few quick, but very important considerations.

Not All eLearning Experiences are Equal

Neither are all classroom experiences. Taking a poor training experience and putting it online just creates a poor online training experience. There are excellent and poor examples of both online and classroom-based training. We don't abandon the classroom just because we had a terrible instructor once. We should not abandon eLearning just because there are examples of poor on-line learning.

There is a Difference Between Knowledge and Skills

Maritime industry workers require both knowledge and skills to do their jobs safely and efficiently. It is important to realize that effective training techniques for knowledge are not the same as those for skills. Having said that, keep in mind that all skills are built on a foundation of knowledge. Therefore even if you believe you are only teaching a skill, there is always a strong knowledge component to that training. So both must always be considered.

Blended is Best for Knowledge

The evidence will be presented below, but here is the quick fact. All else being equal, when comparing on-line learning with classroom-based learning, they come out roughly equal for teaching knowledge - with eLearning offering a slight advantage. Yes - this is surprising (it was to me, anyway, when I was a faculty member doing research to answer this question in the mid 90's). But it is a fact.

More importantly, if you combine on-line and face-to-face training (a technique called "blended learning"), you get significantly better training outcomes than you would have had by employing either on-line or face-to-face training alone. This is very important as it gives us an opportunity to make real training improvements that were simply not available to us 10 years ago. We now have the real opportunity to take maritime training to the "next level".

Blended is Best for Skill

Since blended is best for teaching knowledge, we already know it is the best way to teach the knowledge which underlies the skills mariners need. For the practical aspects of skills, simulations and serious games offer the opportunity to present scenarios to the trainee that could never be replicated in hands-on training. Therefore blending eLearning, simulations and hands-on training provides the best skill training outcomes.

There is No Replacement for Hands On Training

This is one of the most common arguments I hear against on-line learning. I believe that the statement is completely true, but it is in no way an argument against on-line learning.

Hands-on training for skills provides the context, experience, environment and tactile feedback that a simulation will approach, but never fully match. However, simulations

will provide variety in, and control of the training scenario that hands-on training can never match. Taken together, these statements make it clear that each approach offers something the other one does not. That is why combining techniques is so powerful - better than either one alone.

This argument is true for nearly all training techniques you might consider using. Each has strengths and limitations. Rather than using one in isolation or discounting any technique outright, the goal should be to understand the characteristics of each and then design a training approach which takes advantage of each one's strength. Using multiple, complementary approaches yields excellent results.

Technology Offers Some Unique Benefits

Aside from training excellence, adding a technology component yields benefits not available otherwise.

For example, eLearning systems are often excellent at providing deep learning metrics and analytics. This is real-time data about how well your trainees are performing and where the gaps are. This allows you to continuously improve training at your organization and close gaps in training outcomes before they become safety or performance issues.

Another example is how technology can bring training to the trainer. This has the effect of improving access to training - bringing it to those who might not otherwise have any training opportunity. It also allows you to create a more flexible training delivery model. A very common and highly effective approach is blending training by having trainees pre-train remotely (perhaps on-board) using eLearning, and then converge at a central location for a shorter and more effective face-to-face experience.

There are many other quick important facts on the subject. But for now I will turn to the evidence which supports many of the assertions above.

The Evidence

For evidence on this subject, I am going to turn to an article I wrote nearly a year ago on the subject. So if this sounds somewhat familiar, it is. However, it is so important, I am going to include it in this article.

The best evidence I am aware of is a report published in 2010 by the U.S. Department of Education (US DOE). The report (the full text of which can be found here) is entitled "Evaluation of Evidence-Based Practices in Online Learning, A Meta-Analysis and Review of Online Learning Studies". The strength of this report comes from the fact that it is a meta-analysis. This means that it is not, in itself, one

study or one opinion of the effectiveness of eLearning. Instead, this meta-analysis looks at a large number of independent studies and research projects which all try to answer the same question - does eLearning work? It then draws a conclusion based on the strength of the widest possible breadth of investigations. This is very powerful because any biases or study flaws are quickly filtered out of the collective response.

In the case of the US DOE study, the meta-analysis was formed after looking at roughly 1,000 studies, and then filtering them down to 45 studies which were sufficiently rigorous and covered the desired questions directly. These 45 studies were then carefully reviewed to distill the information for this one report. As far as I am aware, there is no better answer anywhere to the question "does eLearning work". The US DOE meta-analysis came to several conclusions. I encourage you to read the full report yourself, since there are many useful nuances to the conclusions below - all of which will provide a greater understanding of eLearning effectiveness. Let's look at some of the most notable conclusions:

Conclusion number 1: Online learning outperforms face-to-face learning:

> "Students in online conditions performed modestly better, on average, than those learning the same material through traditional face-to-face instruction. Learning outcomes for students who engaged in online learning exceeded those of students receiving face-to-face instruction."

The effect size here (the size of the difference in effectiveness) between on-line and face-to-face instruction was quite small, but it does exist with the "win" going to on-line learning. However, with the effect being so small, I have always considered the learning effectiveness between on-line and face-to-face to be roughly equivalent. We can say unequivocally that on-line learning most certainly does not produce inferior outcomes when compared to face-to-face instruction, as many incorrectly believe. I should note, however, that until I performed my own studies in the 1990s, I also assumed that eLearning would be inferior. I was wrong.

Conclusion number 2: Blended learning is best:

> "Instruction combining online and face-to-face elements had a larger advantage relative to purely face-to-face instruction than did purely online instruction."

Blended learning is the technique of combining learning modes - in this case on-line learning and face-to-face learning. The conclusion above indicates that when you use a combination of on-line and face-to-face training, the learning outcomes are better than for either face-to-face or eLearning alone. This makes intuitive sense because each mode of learning has strengths the other one cannot offer. Therefore combining them yields results that either alone cannot offer.

The conclusion here is clear, if your goal is to provide the very best training possible, you should use a combined approach involving both face-to-face training and on-line learning.

Conclusion number 3: Interaction with peers and/or instructors improves learning outcomes:

> "Effect sizes [i.e. the improvement in learning outcomes] were larger for studies in which the online instruction was collaborative or instructor-directed than in those studies where online learners worked independently."

This is a very important conclusion which cannot be stressed enough. One of the major advantages to on-line learning is its ability to connect people to one another. It facilitates informal learning by connecting trainees - allowing them to learn from one another in a way that face-to-face training can't. In addition, despite perceptions to the contrary, on-line learning can be facilitated by an instructor and, as the conclusion above shows, learning outcomes are improved when this is the case. Therefore, while it is indeed possible and effective for trainees to learn on-line independently, the best outcomes are achieved when we use technology to connect people to further facilitate the learning process.

Conclusion number 4: Blending and connecting are the most important considerations:

> "Most of the variations in the way in which different studies implemented online learning did not affect student learning outcomes significantly … Of those variables, the two mentioned above (i.e., the use of a blended rather than a purely online approach and instructor-directed or collaborative rather than independent, self-directed instruction) were the only statistically significant influences on effectiveness."

There are many different ways in which we can facilitate on-line learning. One of the variables we hear about the most is the media type - the choice between text, images, videos, audio, etc. The US DOE study looked at how delivery and media affected the learning outcomes. What they found was that aside from the decision to employ eLearning, the only two variables which created a significant improvement in learning outcomes were blending (combining face-to-face with eLearning) and connecting trainees to an instructor and other trainees - both of which were mentioned above.

Interestingly, however, it was found that substituting one media type for another (for example, video for text) made no significant difference in outcomes. So while there are clearly situations where one media type is preferable over another, this conclusion tells us that aside from these special situations, it is safe to choose media based on what is economical to create and maintain.

Conclusion number 5: eLearning works, regardless of the subject matter:

> "The effectiveness of online learning approaches appears quite broad across different content and learner types."

eLearning has been around long enough and studied long enough that we can safely conclude that it is effective for all kinds of knowledge acquisition. There is nothing special about maritime knowledge or maritime learners that makes the field immune to the benefits of eLearning. That is not to say that there are no hurdles to overcome in maritime eLearning - there are. For example, the availability of internet on-board, and the sophistication of vessel based training both have slowed the adoption of eLearning in the industry. However, those obstacles are being (and have been) largely overcome by maritime-specific learning management systems (LMSs) and the industry is following suit by adopting eLearning methods. This study makes it clear that the benefits of eLearning are not domain-specific.

Conclusion

In an article full of conclusions, there is little to add in "the" conclusion. eLearning works. It has strengths which create an opportunity to do better than we do now. It is not a replacement for face to face or hands-on training - that is the wrong discussion to be having because we already know the answer. The real discussion is how we apply the strengths and advantages that eLearning brings to an industry that is in desperate need of better (not more) training, more uniform training, and an elevated discussion on what we can do to achieve these.

# # #

About The Author:

Murray Goldberg is the founder and President of Marine Learning Systems (http://www.marinels.com/), the creator of MarineLMS - the learning management system designed specifically for maritime industry training. Murray began research in eLearning in 1995 as a faculty member of Computer Science at the University of British Columbia. He went on to create WebCT, the world's first commercially successful LMS for higher education; serving 14 million students in 80 countries. Murray has won over a dozen University, National and International awards for teaching excellence and his pioneering contributions to the field of educational technology. Now, in Marine Learning Systems, Murray is hoping to play a part in advancing the art and science of learning in the maritime industry.

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WORK BASED LEARNING - GUIDANCE FOR SHIPBOARD STAFF

Introduction

Officer Cadets who are following Merchant Navy Training Board (MNTB) approved Foundation Degree programmes will carry out Work Based Learning as part of their academic course. These programmes lead to award of the Foundation Degree Science (FdSc.) in Marine Operations (for Deck Cadets), or Foundation Degree Engineering (FdEng.) in Marine Engineering (for Engineer/ETO Cadets), as well as the UK's Maritime and Coastguard Agency (MCA) first Certificate of Competency.

Background

In 2004, the MNTB initiated (in consultation with Government and the maritime industry) the development of maritime Foundation Degree programmes as the mainstream route for Officer Cadets. The Foundation Degree is a University-level academic qualification, which is designed in conjunction with employers to equip students with the practical and transferable key skills required in the workplace.

The emphasis within any Foundation Degree is on the development of vocational learning and skills. A vital part of that is Work Based Learning (WBL), whereby the student has the opportunity to apply in the workplace the academic knowledge acquired while at University.

Objectives of Work Based Learning

WBL is designed to provide the student with the opportunity to manage their own learning and consolidate their academic knowledge through engaging in work-based activity.

Through the application of their knowledge, and by consultation with experienced personnel in the workplace, the student is able to develop a deep and thorough understanding of the subject area and apply theoretical knowledge in a variety of work based applications.

Method used to facilitate Work Based Learning

WBL will be set during the Academy phase immediately preceding the sea training period. Students will be required to work independently to achieve a variety of activities and assignments that have been agreed in advance between Academy staff and the student.

Onboard the vessel the student is required, in consultation with the Designated Shipboard Training Officer (DSTO), to develop and follow (where appropriate) a programme of study that will enable them to achieve the specified WBL learning outcomes. Throughout the sea training period, the student will be required to engage in academic study and research, utilising onboard resources. In addition to providing a mid-phase report on the progress made with WBL to the Academy Tutor, the student will also be required to produce academic work in a number of professional areas.

Completion of WBL

It is anticipated that the time required to complete this academic work will be approximately 200 hours for each of the two sea phases carried out by Foundation Degree cadets. Assessment of the work produced by the students will be carried out by academic staff on the student's return to Warsash Maritime Academy.

Relationship between WBL and the MNTB Training Record Book

The WBL required to be carried out by students will be consistent with, and complement, the tasks required by the MNTB Training Record Book (TRB). However, the two areas will be assessed and evaluated separately. The TRB provides evidence of professional competence whereas the assessment of WBL provides evidence of academic achievement.

Shipboard Support

Although it remains the student's responsibility to achieve their learning, shipboard staff are requested to give the student every opportunity to carry out practical activities and learn from "hands on" experience, with guidance and support from shipboard personnel.

While progressing the TRB, students are expected to gain the appropriate experience necessary to develop their WBL. They will require access to onboard documentation, publications and where available Internet access. Discussions with shipboard personnel about the student's WBL areas of investigation and study will provide a valuable source of information and interaction for cadets in developing their own ideas and discussions. Given the student workload for completing the WBL (approximately 200 hours in each sea phase), it is anticipated that time will be allocated within each cadet's onboard training programme for academic studies.

Assessment of WBL will be carried out by Academy lecturers. However, shipboard staff are requested to authenticate and verify the cadet's work prior to submission.

Appendix 1:
Extract from the MNTB Maritime Sector Foundation Degrees Framework, September 2005, Work-based learning

Appendix 2:
Warsash Maritime Academy – Outline of WBL Methodology, Marine Operations and Marine Engineering programmes.

Appendix 3:
Example of Deck Cadet WBL Learning Contract

Appendix 4:
Cadet guidance on creating Engineering WBL Programme of Study

Appendix 1:

Extract from the MNTB Maritime Sector Foundation Degrees Framework, September 2005, Work-based learning

4.2 Work-based learning

4.2.1 Work-based learning undertaken aboard ship must be an essential component of every programme.

4.2.2 Intended outcomes should be negotiated between individual learners and providers. Specific objectives will vary with time, circumstances and the ship(s) concerned but should always be related to real work or operational activity and what learners need to do to transfer and consolidate skills in practice. There should be the option of an input from shipping companies to cover specific aspects of shipboard operations, provided these are consistent with the overall objectives of the programme.

4.2.3 Within the national schemes for cadets, work-based learning and practical training aboard ship to meet STCW requirements should be developed and presented as complementary elements of an integrated programme of work to be undertaken during sea phases, recognising that performance of day-to-day work and routines, as well as training activities, will involve learning that can contribute towards achievement of the Foundation Degree. It is envisaged that:

- the focus of work-based learning during the first sea phase will be fairly prescriptive or even standard, bearing in mind the need to allow time for first-trip cadets to acclimatise to life at sea and devote time to basic familiarisation tasks, coupled with the fact that the theory covered during the first phase in college limits what can reasonably be expected to be achieved in terms of work-based learning at that stage of training;

- there will be more scope in the second phase to negotiate learning outcomes more closely related to the specific needs of each cadet, the shipping company and the operations on board, given that at that stage all or most of the theory will have been delivered and the cadet will have gained more experience of the shipboard environment.

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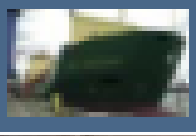

Human factors engineering
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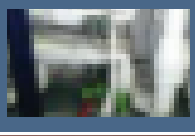

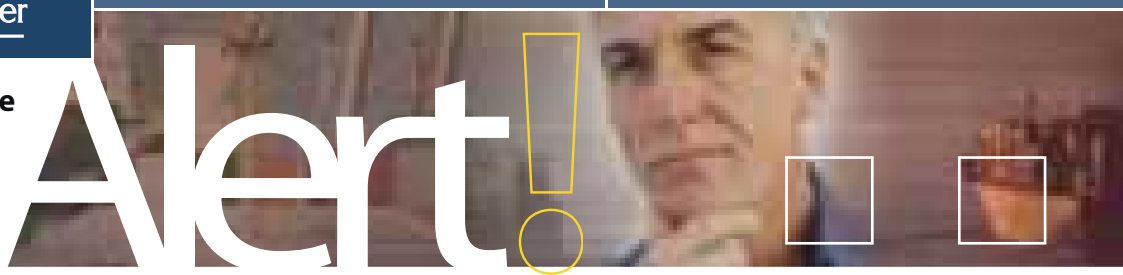

The International Maritime Human Element Bulletin

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– across the whole of the maritime sector.

Some 70,000 of these quarterly Bulletins are distributed, in the main, through the professional journals of The Nautical Institute, The Royal Institution of Naval Architects (RINA), The Royal Institute of Navigation (RIN), The Institute of Marine Engineering Science and Technology (IMarEST), The International Federation of Shipmasters' Associations (IFSMA), The International Maritime Pilots' Association (IMPA) and The Institute of Marine Surveying (IMS). Other maritime stakeholders such as training and education establishments, trade unions, shipyards, naval architects, designers, and regulators receive their copies through direct mailing. Electronic versions are also freely available from the web site.

Our website statistics suggest that the project is truly international, registering visits from some 89 countries from around the world. It is also interdisciplinary in scope, evidenced by the variety of issues that we have so far focused on, not only in the Bulletins but also on the website database.

We are grateful to those of our readers who responded to our request for feedback. *Working hours, fatigue, poor ergonomics, alarms and communication* featured prominently amongst your concerns – we will continue to address these issues in forthcoming Bulletins.

We seek to represent the views of all sectors of the maritime industry – contributions for the Bulletin, letters to the editor and articles and papers for the website database are always welcome.

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Testing times for the crew

When they eventually board their new ship, the expectations of the crew are of a ship that is 'fit for purpose' - designed and built with the user and the operational task in mind, taking into account the environmental conditions that it is likely to encounter during its working life. Few, if any, of the crew will have been involved in the design and build, yet these are the people who are going to work and live within the ship.

It is the crew members – and not just the senior officers - who will first spot those irritating design errors, some of which may not be readily identified until sea trials; but which could so easily be rectified before commissioning, such as: critical lines of sight obscured by equipment, machinery or furniture; poor leads for ropes and wires; tripping hazards around the decks; doors that open onto narrow working alleyways; hand rails that are too close to the bulkhead; poor access and removal routes for equipment and machinery – to name but a few.

The practice of using experienced senior crew standing by the ship to undertake checks of systems and equipment is fading fast. Indeed, in some cases, a substantial discount is offered to purchasers who surrender this right. This discount represents a fraction of the money the yard will save by not being monitored. It is an even smaller fraction of the through-life cost of living with, working around and/or correcting the resulting obstacles to optimum operation of the ship.

It is important that the crew are familiar with their ship, well before it leaves the builder's yard. Those who have to operate the various systems must be properly trained on them; they should not be expected to 'pick it up' after they have joined the ship, or accept a quick briefing on it from the commissioning engineer, or simply read the handbook - which may in itself be technically complicated, difficult to understand, and not even written in the native language of the reader.

These are testing times for the crew, in more than the truly literal sense – the ship may prove eventually to be effective and productive to the owner or operator, but how much more effective and productive would it be if it were also acceptable, safe and operable to the crew?

Taking over

Trainee Induction

Induction is a process for helping a trainee to settle into new working and social environments. There are two periods where a new entrant may find him/herself feeling vulnerable, that is: during the first semester at college and then during the first sea phase. It is important, therefore, that the trainee is made fully aware of what the college and company expect of them, of what they should expect of the company and college and of what they should expect of those who will be responsible for their onboard training.

The induction process should start at the initial interview, during which the prospective trainee must be made aware of the various social and cultural issues that could affect their decision as to whether they are suited for a career at sea:

1. **On board environment**

   The trainee could easily feel socially isolated, especially during the first trip to sea, if the first language of the trainee is not that of the majority of those serving onboard.

2. **Discrimination**

   In what is a male-dominated industry, it is important that women trainees are not discriminated against.

3. **Attitude and motivation**

   The attitude and motivation of the trainee is important – if this is wrong it can frustrate everything else.

4. **Understanding different cultures**

   The trainee must have an understanding of the cultural backgrounds, beliefs and attitudes of the different nationality groups with which they may work, both at college and at sea.

5. **Understanding the risks**

   The trainee must be made aware of the risks that they may face when at sea, not least piracy and criminalisation of the seafarer.

Company induction

The purpose of the company induction should be to engender in the trainee a sense of belonging to that company. The following subject areas are suggested for inclusion:

- An introduction to the company, its mission and organisational structure
- Communications
- The Training agreement
- Conditions of service (pay and allowances, subsistence, leave etc)
- Required standards of dress
- Safety
- Accommodation/living arrangements
- Discipline and complaints procedure, including bullying and discrimination

College/university induction

The first college/university phase is often referred to as pre-sea training. As such it should cover an outline of the industry and its organisation; ship familiarisation; survival and safety; accident prevention; practical seamanship; health and hygiene and further training opportunities.

Shipboard induction

The trainee will invariably arrive onboard just as the ship is preparing to leave port. Induction may not be really possible until the ship is underway, but it is extremely important that the trainee completes the Safety Induction programme before the ship sails,

Every trainee should be entrusted to a responsible crew member to show them their accommodation, explain the social arrangements and introduce them to other ship staff. The newcomer should then be interviewed by the Master or head of department who can explain about the more formal aspects of employment, pay, disciplinary procedures etc.

It is during the first few weeks on board that new trainee's attitudes and impressions will be firmly shaped and which will determine whether they stay or leave after the first trip. Onboard induction is an ongoing process that is only complete when the trainee feels accepted as a valued member of the ship's team. But, the trainee also has an important role in this process: attentiveness and a willingness to learn will engender support from the whole ship's team.

Everyone who comes into contact with the new trainee will have some influence on the induction process. Successful induction is based on pre-planning - having some formalised system that is thought out before the trainee arrives. The Master will have ultimate responsibility in ensuring that the company's induction procedures are implemented on board, but it will usually be the new trainee's immediate supervisor who will carry out the induction process.

(With grateful thanks to the UK Merchant Navy Training Board)

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Training Needs Analysis – What, How, Why…

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Training Needs Analysis (TNA) measures the skills needed to do something, and how the people involved match these skills. By subtracting existing skill from skill needed, a list of Training Objectives is created, forming a basis for developing training material.

TNA provides two other essential outputs:

- The skills to be trained will guide the selection of training media, such as checklists - which are good for supporting procedural skills; and team training - building a team from disparate cultural backgrounds - which cannot be done individually.

- Gathering the TNA data will provide optimum familiarisation for the analysts of both the tasks and the trainees. However well the analysis results are written down, the best understanding will remain with the analysts.

The best TNA work results from a team of subject matter experts (people with knowledge/experience of the tasks and environment) and others, such as psychologists/ergonomists, who may not necessarily be experts in the subject matter but have an understanding of skills, skill acquisition and retention and of the merits of different training media.

Properly done, the TNA process makes training efficient, cost effective and interesting, since the resulting training will align with the need. The process works particularly well for the introduction of a new system, or when replacing an existing system, where all users are at the same level of training need. TNA will also identify and help with situations where the user population has a mixed skill level or varied cultural backgrounds.

In summary, a disciplined/structured TNA process will optimise the use of training media and training manpower. The end result will see the provision of suitably qualified and experienced people to conduct the job, thus minimising risks and unnecessary costs to shipping personnel, environment and the industry.

Good Intentions are not Enough: CROSS-CULTURAL TRAINING for seafarers, a MUST-HAVE of Intercultural education

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Abstract

Maritime transportation forms an integral part of what regulatory agencies requires for the safe navigation and operation of vessels. Therefore, the maritime industry's compliance with governmental regulations and international protocols has been essential for maritime safety management. As a basis to this aspect, the preparation of maritime students as the forthcoming maritime officers in the future has been a crucial point by the maritime educators in terms of maritime safety.

Despite unquestionably good intentions on the parts of most people who call themselves intercultural educators, most intercultural education practice supports, rather than challenging, dominant hegemony, prevailing social hierarchies, and inequitable distributions of power and privilege.

Training Programs designed for preparing seafarers for working in multinational environment are usually referred to as "Cross-Cultural or Intercultural Orientation Programs." It seems that the early practitioners and researchers viewed preparing people for international assignment as a process in which one needed to be oriented to the differences in social interactions between the two cultures. However, researchers and practitioners alike are realizing that we need to do more than orient people to prepare them to live abroad and the field is being referred to as "Cross-Cultural or Intercultural Training" by more and more people.

A seafarer must be trained to demonstrate the ability to communicate effectively and to exchange information in carrying out his/her responsibilities. Relying on the modern educational theory, the maritime lecturer has to find the way to describe how intercultural communication should be taught.

The aim of this paper is to bring forth the importance of teaching intercultural communication skills to the seafarer who is to embark on a multilingual vessel, and to point out specific instruction and evaluation of communication skills as they relate to the seafarers responsibilities including good communication with his/her peers.

Key words: *cross-cultural training, MET, seafarer, maritime lecturer, teaching intercultural communication*

"*Each one of us is an artist creating an authentic life*"
SARAH BAN BREATHNACH

Introduction

In response to different views for various *Training Programs*, publishers are including cultural information in their ESL texts, and teachers are beginning to recognize the importance of the underlying dynamics of a culture in Language Communication. Such steps are laudable, but they may fall short of the mark when it comes to actually equipping students with the cognitive skills they need in a second-culture environment.

From country to country, social taboos, politics, and religious traditions and values differ. These cultural variables need to be respected if students are to benefit from new experiences. Yet the commercial market today does not seem to have a universally applicable Intercultural Communication program or text that is suitable for culturally divergent student populations. To compensate for the lack of Intercultural Communication materials, teachers or instructors often need to develop their own Intercultural Communication courses that meet local standards of acceptability. Once teachers/instructors understand the basic concepts of cultural comparison, they can develop appropriate learning materials.

This paper will outline the one semester course (14 weeks-28 hours) in Intercultural Communication at Constanta Maritime University that develops the students' cognition skills needed to understand life in multicultural crews on board ships. The initial part of such a course is intended to heighten the participant's awareness of his or her own culture; the latter part focuses on assumptions, values, and behaviors of the target culture. Although the course described herein is designed for culturally homogeneous classes, it could serve as a model for multicultural groups anywhere.

Therefore this paper will describe in its first part the basic parameters of the Intercultural Communication Course along with the units of its contents and the basic reality assumptions as the themes of this two-part course. The Methodology and the Pedagogical approach will be analyzed in the second part of this paper, so to be able to discuss the recommendations in the end it.

1. Listening! The Foundation for change!

The ability and need to communicate touches every area of our lives. Everything we do in life requires communication with others. Just try to not communicate at work for a day or in your business transactions and see what happens. Refuse to communicate in your personal relationships and see what kind of interesting results you'll create.
Much of communication theory focuses on how to speak to others and how to convey your message. But, communication is really a two-way process. It is an *activity*, not a one-time event. The listener's role is as central to the communication process as the speaker's role. Real communication and connection occur when the Speaker AND Listener participate in the process.

Section B-I/6
Guidance regarding training and assessment

Qualifications of instructors and assessors

1 Each Party should ensure that instructors and assessors are appropriately qualified and experienced for the particular types and levels of training or assessment of competence of seafarers, as required under the Convention, in accordance with the guidelines in this section.

In-service training and assessment

2 Any person, on board or ashore, conducting in-service training of a seafarer intended to be used in qualifying for certification under the Convention should have received appropriate guidance in instructional techniques*.

3 Any person responsible for the supervision of in-service training of a seafarer intended to be used in qualifying for certification under the Convention should have appropriate knowledge of instructional techniques and of training methods and practice.

4 Any person, on board or ashore, conducting an in-service assessment of the competence of a seafarer intended to be used in qualifying for certification under the Convention should have:

.1 received appropriate guidance in assessment methods and practice*; and

.2 gained practical assessment experience under the supervision and to the satisfaction of an experienced assessor.

5 Any person responsible for the supervision of the in-service assessment of competence of a seafarer intended to be used in qualifying for certification under the Convention should have a full understanding of the assessment system, assessment methods and practice*.

Use of distance learning and e-learning

6 Parties may allow the training of seafarers by distance learning and e-learning in accordance with the standards of training and assessment set out in section A-I/6 and the guidance given below.

Guidance for training by distance learning and e-learning

7 Each Party should ensure that any distance learning and e-learning programme:

.1 is provided by an entity that is approved by the Party;

.2 is suitable for the selected objectives and training tasks to meet the competence level for the subject covered;

.3 has clear and unambiguous instructions for the trainees to understand how the programme operates;

.4 provides learning outcomes that meet all the requirements to provide the underpinning knowledge and proficiency of the subject;

* The relevant IMO Model Course(s) may be of assistance in the preparation of courses.

.5 is structured in a way that enables the trainee to systematically reflect on what has been learnt through both self assessment and tutor-marked assignments; and

.6 provides professional tutorial support through telephone, facsimile or e-mail communications.

8 Companies should ensure that a safe learning environment is provided and that there has been sufficient time provided to enable the trainee to study.

9 Where e-learning is provided, common information formats such as XML (Extensible Markup Language), which is a flexible way to share both the format and the data on the World Wide Web, intranets, and elsewhere, should be used.

10 The e-learning system should be secured from tampering and attempts to hack into the system.

Guidance for assessing a trainee's progress and achievements by training by distance learning and e-learning

11 Each Party should ensure that approved assessment procedures are provided for any distance learning and e-learning programme, including:

.1 clear information to the trainees on the way that tests and examinations are conducted and how the results are communicated;

.2 have test questions that are comprehensive and will adequately assess a trainee's competence and are appropriate to the level being examined;

.3 procedures in place to ensure questions are kept up to date;

.4 the conditions where the examinations can take place and the procedures for invigilation to be conducted;

.5 secure procedures for the examination system so that it will prevent cheating; and

.6 secure validation procedures to record results for the benefit of the Party.

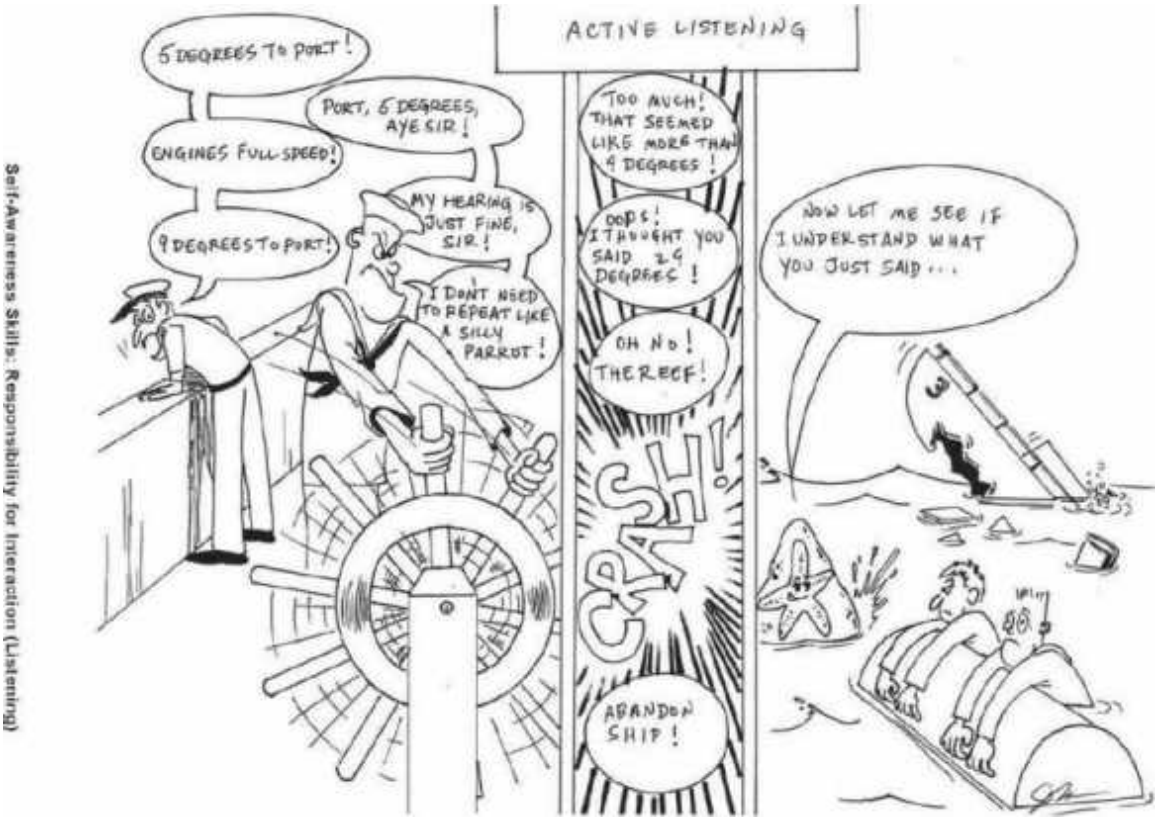
Register of approved training providers, courses and programmes

12 Each Party should ensure that a register or registers of approved training providers, courses and programmes are maintained and made available to companies and other Parties on request.

Section B-I/7
Guidance regarding communication of information

Reports of difficulties encountered

1 Parties are encouraged, when communicating information in accordance with article IV and regulation I/7 of the Convention, to include an index specifically locating the required information as follows:



Listening is the key for understanding others and building strong relationships. Three dynamics are involved in each relationship: *rapport*, *control* and *trust*. Therefore there are three types of Listening. These include *selling yourself listening, control listening*, and *attentive listening*.

a. **Selling yourself listening: Wanting to lead**

You listen briefly and then interrupt to disagree, give advice, or sell your perspective to the other person.

b. **Control Listening: Wanting to Clarify**

You use questions to control the direction of conversation. The Four kinds of Control Questions (John Nielsen, 2008) include the following:

1. *Why* questions
2. Leading questions
3. Closed ended questions
4. Multiple questions

c. **Attentive Listening: Wanting to discover**

This type of listening helps gain an overview, understand, deal with "what is", and connect with others.

Now, let's look at the skills involved with the listening cycle:

Skill no.1: Looking, Listening, Monitoring Congruencies

This skill involves establishing *rapport* – matching to create rapport- and tracking dialogues and attitudes. Look and listen for opportunities to service to other person.

Skill no.2: Acknowledge Messages

Validate what the other person says at different junctures even if you don't agree. I don't have to agree. However when I acknowledge the other person, I'm telling them that what they say has value.

Skill no.3: Invite More Information

Ask for more information in a user-friendly way even when you don't know what to do.

Skill no.4: Gaining Understanding and Clarifying

Asking open-ended question (in a user-friendly way) and checking out your interpretations. Checking out body language for congruence or mixed messages.

Skill no.5: Summarizing- to Ensure Accuracy of Understanding

This process guarantees understanding by summarizing the essence of the message. Paraphrase what you actually hear. Focus on the speaker's message. Don't rebut. Summarizing shows understanding and punctuates a conversation.

We all need to feel that we are being heard and understood. It is a basic human need that is as primary a need as having enough water, food or air to survive. So, try out any of these suggestions and you will experience more of a connection to those around you. And, if all else fails just remember these words by Epictetus, an ancient Greek philosopher, and you are guaranteed to improve your listening skills: *"Nature gave us one tongue and two ears so we could hear twice as much as we speak."*

2. Organizational Culture and Communication

What is meant by organizations having a 'culture'? Countries and ethnic and religious groups have cultures at a large or 'macro' level, but such a term is increasingly being applied in a 'micro' way to describe the attitudes, values and behavior present in an organization. I explore here the idea of organizations having cultures and what impact this might have with communication within those workplaces generally and within the seafarer's environment particularly.

In the past few decades, researchers have suggested that organizations do indeed have their own cultures, and that they have a dramatic effect on communication patterns and practices. An organization's culture is its 'personality', its feel, what distinguishes it from other organizations, a coding of 'the way things get down around here'. An organization's culture is most apparent to an outsider interacting with the organization for the first time, or when two organizations merge or experience a takeover.

Management scholars Stephen Robbins and Neil Barnwell suggest that the following are key characteristics of organizational culture:

1. *individual initiative*- the degree of responsibility, freedom and independence that individuals have;
2. *risk tolerance*- the degree to which employees are encouraged to be aggressive, innovative and risk seeking;

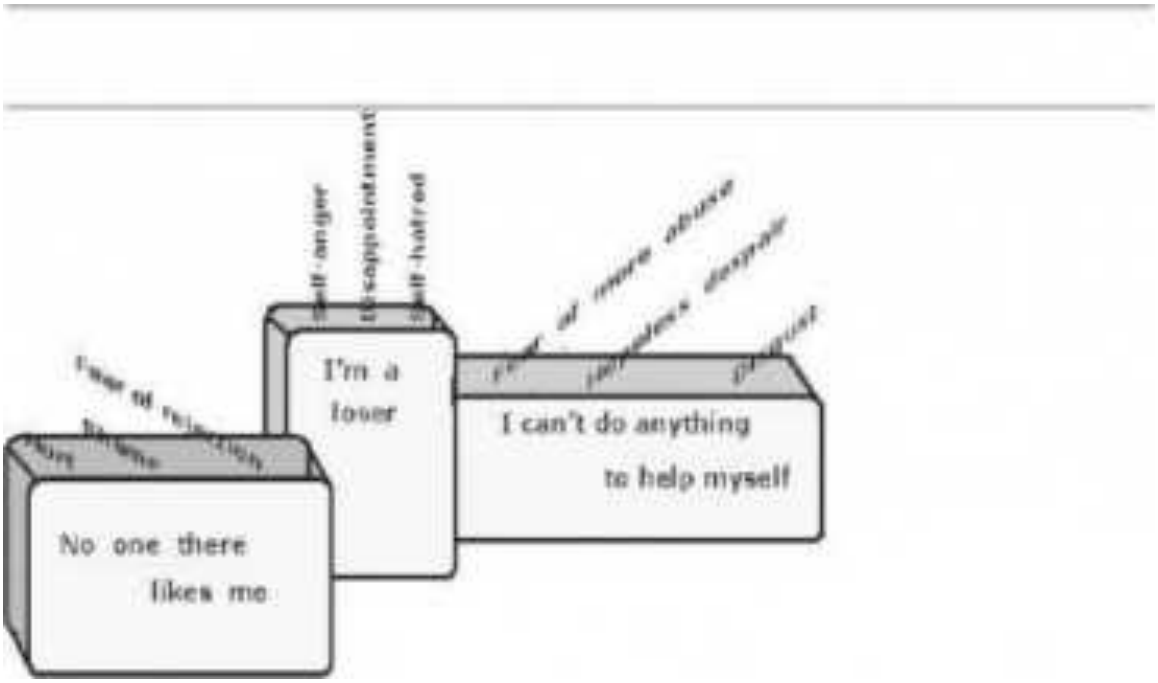
3. *direction* – the degree to which the organization creates clear objectives and performance expectations;
4. *integration* - the degree to which units within the organization are encouraged to operate in a coordinated manner;
5. *management contact* - the degree to which managers provide clear communication, assistance and support to their subordinates;
6. *control*- the degree to which rules and regulations, and direct supervision, are used to oversee and control employee behavior;
7. *identity* - the degree to which members identify with the organization as a whole, rather than with their particular work group or field of professional expertise;
8. *reward system*- the degree to which reward allocations (that is salary increases, promotions) are based on employee performance criteria;
9. *conflict tolerance*- the degree to which employees are encouraged to air conflicts and criticism openly;
10. *communication patterns* - the degree to which organizational communications are restricted to the formal line hierarchy of command;

Culture is also transmitted in other ways, such as:

- *Rituals* - recognition and reward ceremonies, Friday afternoon or after-hours socializing, annual company picnics, contests, initiations;
- *Stories* – myths, gossip, jokes, anecdotes, narratives about people, events and things;
- *Material symbols*- the non-verbal communication of clothing, grooming, furniture, vehicles, parking, perks;
- *Language*- specialized language, jargon, nicknames and so on.

Some of these expressions are initiated and maintained by the formal organizational system, while some are also initiated and maintained by the informal organizational system.

To enter another culture with only the vaguest notion of its underlying dynamics, reflects not only “a provincial naiveté but a dangerous form of cultural arrogance” (Barnlund 1991).



In helping workers/seafarers to keep daily activities in line with appropriate feelings and worthwhile purposes, management has three major responsibilities:

a. To make the fact of work and of daily work relationships such that they do not necessarily deaden appropriate feelings;
b. To communicate its own purposes about work, and its feelings about the employee relationship, in such a way that employees can understand and assent;
c. To develop better communication, so that the suitable feelings and purposes of management and workers can be put to work to strengthen the bonds of group living.

3. Training Program: Intercultural Communication Course

A seafarer must be trained to demonstrate the ability to communicate effectively and to exchange information in carrying out his/her responsibilities. Relying on the modern educational theory, the maritime lecturer has to find the way to describe how intercultural communication should be taught.

In this paper we try to bring forth the importance of teaching intercultural communication skills to the seafarer who is to embark on a multilingual vessel, and to point out specific instruction and evaluation of communication skills as they relate to the seafarers responsibilities including good communication with his/her peers. We shall analyze all these by describing the **Intercultural Communication Course** for Romanian students- maritime officers in the future- implemented at Constanta Maritime University.

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The value of the training ship
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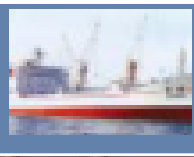

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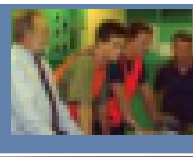

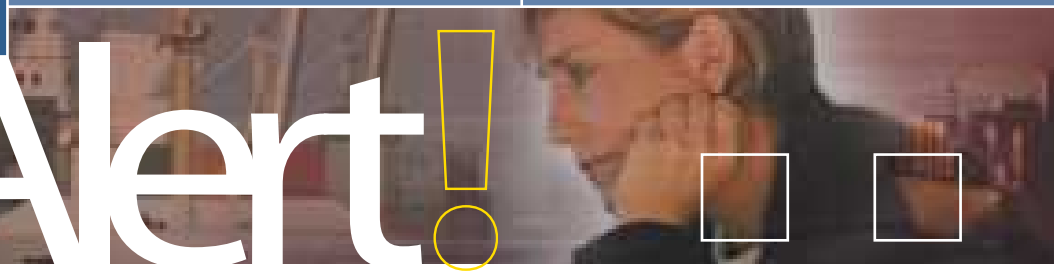

The International Maritime Human Element Bulletin

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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3.1. The Basic Parameters of the Intercultural Communication Course

To begin, we need to recognize the parameters within which we operate and to consider our particular situations. We also must decide on cultural elements that may be too sensitive to be discussed in class. These may include delicate matters such as male-female relationships, controversial political issues, and volatile subjects like alcohol, sexual orientation, and drugs. Topics that we often discuss in our own societies can create major problems when raised in classes. Consequently, we need to identify those sensitive topics and keep them in mind when designing our own course.

3.2. Course Part One: Home culture

Because it is not always clear exactly what ought to be covered in an Intercultural Communication Course, I will suggest topics and sequencing that have worked well for my course syllabus. Part one (14-hour units) begins with modules of instruction that allow students to explore their own cultures before venturing into unknown territories (Grove 1982). The first third of this course raises the participants' awareness that they are members of a particular culture. By exploring their own culture, students acquire the vocabulary to describe values, expectations, behaviors, traditions, customs, rituals, forms of greeting, cultural signs, and identity symbols familiar to them. Once students know how to talk about their culture, they are ready to discuss the values, expectations, and traditions of others with a higher degree of intellectual objectivity.

Unit no.1: Defining culture (2-hour classes)

We begin by defining what *culture* is. To do this we allow students to brainstorm freely but lead them to the ideas that culture is the total way of life of a group or society; that all humans living in groups have cultures; that there are no "inferior" or "superior" cultures; and that cultures are formed to meet human needs.

Unit no.2: Defining human needs (2-hour classes)

Once we have a definition of culture, we explore the concept of *human needs* in general. Abraham Malsow (1962) has suggested "*higher order*" and "*lower order*" needs that all cultures try to meet. Lower order needs are physical requirements such as food, water, and shelter; whereas formal education, self-development, self-fulfillment, and so forth, are higher order needs.

Once we have identified universal human needs, we discuss what needs are particular to the students' own culture. These might include security, religious requirements, or political imperatives unique to our students. The aim of the exercise is to instill in students the sense that they are members of a culture and that their way of life has evolved to meet particular needs.

Unit no.3: Behaviors (4-hour classes)

Having arrived at a characterization of culture and having explored human needs, we then relate needs and culture to *behaviors*. In one or two seminars, students become aware that behaviors are culturally prescribed norms intended to meet expectations or needs shared by

members of a culture. They learn, for instance, that certain social occasions demand specific behaviors and speech-acts.

For this module, we have chosen an exercise called **"What's Rude?"** in which participants identify rude and polite behaviors appropriate in their culture. We discuss what ***to say*** and ***do*** when calling on strangers, friends, elders, and social superiors. However, we only mention briefly how members of other cultures respond in similar situations. Here, the goal is for students to become aware that norms of behavior are culturally defined and varied. We feel that they need to learn the cultural codes of their society before they discover the codes of conduct of the target culture.

Unit no.4: Friendship (2-hour classes)

Next, we focus on *friendship* as a culturally defined concept. We discuss **how, when, where,** and **with whom** people typically become friends in their culture. Questions to explore might be what determine friendship; whether friendship is a practical matter, an emotional bond, or a relationship of mutual obligations; and if men and women can be friends. By brainstorming in groups, students begin to realize that there are patterns of expectations, prescribed behaviors, and obligations attached to social relationships, and that there is purpose and predictability to interpersonal relationships.

Unit no.5: Cultural symbols and rituals (4-hour classes)

For variety, we have included signs and symbols (identity symbols) of the culture. To teach this we use a *show-and-tell format* in which students explain meaningful objects, items particular to a culture such as a rice bowl, chop sticks, the national flag, or an animal/a flower used as a national symbol. Participants explain what objects represent or mean, and the rules, if any, for their uses. We then examine cultural rituals and any social values that produce such rituals. We explore the procedures, symbols, and prescribed behaviors of common events like weddings, rites of passage, festivals, and so forth. These are related to human needs and culturally defined values and expectations. The goal of this unit is to relate cultural behaviors to the things people value, expect, and commonly take for granted.

3.3. Course Part one: Methodology

The methodology used in the first part of the course is *student-centered*: students hypothesize, brainstorm, discuss, conclude, and inform the teacher/instructor of their findings. In other words, the students teach the teacher. This approach makes sense, especially when the teacher/instructor finds himself or herself in a multicultural classroom/group of students. The benefits of this approach are a high degree of student motivation, a great amount of oral language practice, and student-generated learning. Students work in groups of threes or fours on everything. Then they have to perform their show-and-tell presentations. At the end of this part of the course, participants are graded on group/class participation, on the quality of their presentations, and on a terminal quiz on concepts taught in this part of the course.

3.4. Course Part Two: Target culture

Till here, we have focused on the students' culture. Our intention has been to raise the students' awareness of their own way of life, to acquaint them with some basic cultural concepts,

Extract from the International Safety Management Code

IMO Resolution A.741(18) as amended by MSC.104(73), MSC.179(79), MSC.195(80) and MSC.273(85)

Article 6

6 RESOURCES AND PERSONNEL

6.1 The Company should ensure that the master is:

.1 properly qualified for command;
.2 fully conversant with the Company's safety management system; and
.3 given the necessary support so that the master's duties can be safely performed.

6.2 The Company should ensure that each ship is manned with qualified, certificated and medically fit seafarers in accordance with national and international requirements.

6.3 The Company should establish procedures to ensure that new personnel and personnel transferred to new assignments related to safety and protection of the environment are given proper familiarization with their duties. Instructions which are essential to be provided prior to sailing should be identified, documented and given.

6.4 The Company should ensure that all personnel involved in the Company's safety management system have an adequate understanding of relevant rules, regulations, codes and guidelines.

6.5 The Company should establish and maintain procedures for identifying any training which may be required in support of the safety management system and ensure that such training is provided for all personnel concerned.

6.6 The Company should establish procedures by which the ship's personnel receive relevant information on the safety management system in a working language or languages understood by them.

6.7 The Company should ensure that the ship's personnel are able to communicate effectively in the execution of their duties related to the safety management system.

to give them vocabulary with which to talk about culture, and to cultivate a degree of intellectual objectivity essential in cross-cultural analyses. Our next objective is more challenging: to create an awareness of the building blocks of our particular worldviews in relation to other worldviews. Our purpose is to foster a certain degree of understanding of the target culture from an insider's perspective—an empathetic view that permits the student to accurately interpret foreign cultural behaviors.

We cover nonverbal communication, cultural assumptions, values, expectations, stereotypes, and cultural adjustment or culture shock (Paige 1993). In a 14-hour component, we emphasize how those elements of our worldview can become roadblocks to intercultural understanding and how they can undermine the formation of an intelligent perspective of a foreign culture. We discuss and analyze critical incidents to see how our worldviews occasionally collide and leave people perplexed and offended (Storti 1994).

Unit no.1: Basic reality assumptions (2-hour classes)

Also in the second part of the course, we teach the most challenging concept—"*basic reality assumptions*". In this module, course participants try to define which values or ideas are behind our values, perspectives, attitudes, and consequently our expectations and behaviors. We explore what our students, in their culture, assume to be true about the world and the way things work, and we compare and contrast these with Romanian assumptions about reality. Basic premises about time, progress, the purpose of life, human nature, God, the invisible world, and many other things may be similar or remarkably different from culture to culture.

The aim of our discussions is to recognize some basic perspectives that underlie our interpretations of the world and to acknowledge that such assumptions can differ. What we hope emerges from our discussions is that, contrary to what we have been taught, truths or assumptions are not necessarily universal. What is real or true to one group may not be real or true for Romanians, for example. Recognizing that there are essential differences in worldviews permits students to respond more effectively when cross-cultural communication breaks down, as it most certainly can (Stewart and Bennett 1991).

Unit no.2: Cultural values (2-hour classes)

Next we center on things, qualities, or abstract ideas that a culture considers valuable. We explore the students' cultural values and compare and contrast them with mainstream Romanian values. We do this by examining such popular Romanian proverbs and sayings as *"He who steals an egg today, will steal an ox tomorrow"*, "*Every bird dies by its own tongue*", "*Water flows, but rocks remain*", "*There's no smoke without fire*" since cultural values are embedded in sayings. As many cultures have similar sayings that transmit attitudes and values, you will find students eager to compare such memorable maxims. The point, however, is to note the cultural values that are associated with the sayings and proverbs.

In keeping to our goal of raising student awareness of cultural values, we examine the qualities that we admire in our heroes. These, like other determiners, are culturally defined even though they may be universally shared. Values such as perseverance, innovativeness, individualism, cooperation, self-motivation, loyalty, friendship, public service, and piety may be exemplified through biographies of famous men and women who have contributed to a society. We discuss the biographies of Romanian heroes from all ethnic backgrounds who embody values shared by Romanians. What emerges from this exercise is an awareness of the values of the target culture and the degree to which we share such values.

Unit no.3: Human cognition (2-hour classes)

To prepare for our discussion on stereotyping, we have a module on *human cognition*. The mind tends to jump to conclusions and acts on them based upon a minimal amount of sensory input (Summerfield 1993). Before all the data are known, we have already attributed meaning to our impressions and find ourselves acting on these, often to learn that we have been mistaken. To demonstrate that we see what we expect to see out of habit rather than what is actually there, we show photographs, for example, of street scenes, and elicit various interpretations which reflect what individuals assume is happening. Such demonstrations illustrate that our perceptions can be erroneous and that we are culturally conditioned to expect things to be a certain way. This lesson prepares our students for the module on stereotyping.

Unit no.4: Stereotyping (2-hour classes)

Stereotypes are gross simplifications that neatly sum up members of other groups or cultures. Such impressions prevent a more profound understanding of who others are as individuals and as members of social groups. Stereotypes are probably the most difficult stumbling block to overcome for any person in a foreign environment, and as such, the topic requires considerable attention in **Intercultural Communication** Courses.

First, students need to learn what stereotypes are and how they interfere with communication. Students discuss common impressions they have of various nationals and then are asked where these impressions come from (their cultural background, or practice on board ship within multilingual crew etc). The next step is to find out whether students have any firsthand knowledge of foreign nationals and whether foreigners really have these characteristics. It becomes apparent that while there may be a kernel of truth to stereotypes, they do not adequately represent individuals. Students then learn that stereotyping prevents our dealing effectively with members of other societies.

For discussion sessions, we use films and other visual media showing members of the target culture. By becoming aware of their preconceptions about the target culture, students will be able to overcome stereotypes.

Unit no.5: Culture shock (2-hour classes)

We also have a module on culture shock and adjusting to a foreign environment of life/work on board ship. Students seldom know what to expect when they join a multilingual crew. In order to prepare them for this experience and to teach some coping skills, our course includes also the video entitled *Cold Water* by Noriko Ogami (1988), which we show in manageable segments. We ask students to identify stereotypical impressions of Americans. Then we examine common patterns of cultural adjustment—the emotional patterns of highs and lows that students would have to deal with while abroad (Weaver 1993).

Unit no.6: Cross-cultural communication (4-hour classes)

Finally, in the latter part of the course, students learn to analyze incidents that involve cross-cultural misunderstandings—conflicts of values and expectations. Teachers/ instructors write scripts about common interpersonal occurrences in which characters from different cultures have divergent interpretations of what is said or done. Students must identify the communication problem in the incident, determine the values involved, and correct the misunderstanding. The

objective is to teach participants to analyze misunderstandings in cultural terms and to help them learn to deal effectively with similar situations.

3.5. **Pedagogical approach**

The focus in the second part of the course is the free exchange of interpretations and ideas. While the teacher/instructor may be the authority on the target culture, he or she cannot possibly anticipate all difficulties students encounter in comprehending another culture. Hence, student-centered talk and student-centered activities are particularly important. As in the first part of the course, students need constant reminders that the cultural concepts they are learning have practical relevance to their ultimate goal—cultural adjustment and a successful experience abroad while they are on board ship. Although teachers may vary the types of exercises they use and substitute the cultural topics discussed, we advise contrasting cultural values in the latter part of the program when students are more knowledgeable and have a greater degree of objectivity.

4. **Conclusion**

By custom designing their own Intercultural Communication Course, teachers can meet the particular needs of their students. However, it is important to follow the recommended sequencing of topics, beginning with an exploration of the home culture before contrasting values, expectations, and behaviors of the target culture. Once we are aware of how culture determines our lifestyles and behaviors, we are all in a better position to reach across our many borders.

It is essential for seafarers of all nationals to be capable of communicating appropriately and effectively, appreciating cultural variation, and resolving conflicting views from the basis of a perspective broader than any single particular worldview. In addition to acquiring proficiency in language, it helps seafarers to move away from cultural rigidity and ethnocentrism, and lean towards greater openness and understanding of fundamental socio-cultural norms of other human beings. The more seafarers can understand each other, the more likely they are to run not just an efficient and safe ship, but a ship on which personal and working relationships can be built up.

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Continuing Professional Development

a notion of lifelong learning

Captain Martin Burley MNI, *Group Training Director, V Ships*

What do we mean by Continuing Professional Development (CPD)? How can it empower individuals within the context of their learning? And, how can we capture the concept to provide more capable maritime professionals?

In the maritime context, CPD can be defined as:

The systematic maintenance, improvement and broadening of knowledge and skills, and the development of personal qualities necessary for execution of professional and technical duties throughout the individual's working life, at sea and ashore.

Clearly, development of the individual is the key output, but this definition also includes the notion of lifelong learning. Opportunities within the industry are vast, but many maritime professionals are poorly informed, and do not have role models or access to information to research their options and identify their aspirations.

Many companies have Competence Management Systems (CMS) that look at the matrix of learning requirement for their employees and determine their collective capability. A CMS manages the competency of individuals to ensure they can fulfil their duties within their current job; but often it does not enable employees to identify and manage their own development, aligned to their own needs. A CPD system, such as the new web based system recently launched by The Nautical Institute, should complement a CMS: The former enables individuals to manage their learning against their goals, while the latter manages the collective capability of a company's employees to ensure that they can fulfil assigned duties.

For most maritime professionals, CPD is very much part of their lives - they attend learning events and programmes, but more as a matter of itinerant opportunity or chance, and not as part of a structured plan to develop in alignment with their career aims.

But how is CPD managed? Do individuals research and identify their aspirations with a structured and focused approach? Is their learning tailored actively to their aims and objectives? Do they take time to reflect upon their learning activity to support and refine future research into their CPD needs?

Certainly they may have researched their options for career development. They may well have decided to pursue a specific qualification in support of a chosen career path such as a Masters degree or a surveyor or harbour master's diploma. Some are successful, and some fall by the wayside and then end up in another maritime sector.

The part of the CPD wheel that encourages a more structured and far-sighted approach is Reflection. Clearly, individuals will reflect upon their learning events, but busy people often do not have the time to do this in a disciplined way. CPD encourages more regular reflection on the overall development programme so that individuals can assess whether their current strategy is right for them or whether they should adjust their plan to follow a different course.

Not only does this save time and money, but it is a positive approach which leads away from de-motivation when aims appear to be distant, and helps to spur the individual into setting new and achievable goals.

Further information on the Nautical Institute's CPD portal can be found at: www.nautinst.org

Mentoring

...in the Maritime Industy

Murray Goldberg, Founder and CEO, Marine Learning Systems Inc

By many estimates, as much as 70% of professional knowledge comes from various forms of informal learning. There are very few forms of informal learning as effective and personal as mentoring.

Mentoring is particularly applicable to the maritime industry where practices and traditions are deep and varied. It is one of the most effective ways of transferring this knowledge from one generation of mariner to the next. In addition, the maritime industry is in desperate need of attracting new, bright, young mariners. Raising awareness and knowledge of the industry through the availability of career mentors and role models can help meet this need.

Despite these values, the availability of mentoring can be limited in the maritime industry. At issue is the isolation of being at sea, and the small size of most crews. When mentoring in the maritime industry does happen, it is typically short-lived because one of the participants sooner or later ends up on a different vessel or different shift. Fortunately technology has provided some solutions which are discussed later in this article.

What Isn't Mentoring?

Before discussing what mentoring is, it is important to understand what it is not. Mentoring is not training. Training and mentoring have different goals, teach different knowledge, and require different techniques and tools.

Training should be formal, structured, standardized, and well analysed. Its outcomes should be reliably and validly assessed. Mentoring, while extremely valuable, is not formal, structured, standardized nor well analysed. Its outcomes are rarely assessed. Mentoring and training work together - neither is a substitute for the other.

Then what is Mentoring?

Mentoring is a confidential, trust-based, voluntary relationship between a mentor (someone with significant experience in some area) and a protégé (someone who either wishes to work in that area, or is working their way through the ranks). The idea, of course, is that the mentor is able to provide guidance based on his or her experience to help the protégé make more informed professional choices.

Mentors are role models, advisors, supporters, leaders, motivators, network enablers and sources of wisdom, experience, and inspiration

The most important characteristics of a good mentor, other than expertise and experience, include a genuine desire to be helpful, good communication skills and patience.

Good mentoring relationships and interactions have a number of characteristics:

- **Long-Lived:** The value of a long-lived relationship is that the mentor has much more intimate knowledge of the personality, goals and context of their protégé. It is this intimate knowledge that enables the mentor to provide appropriate guidance.
- **Personal:** The implications of the mentor's guidance to the life of the protégé are significant, and the personal connection creates a responsibility to the protégé to respect this significance. Likewise, protégés need to feel as though they can trust their mentor, and this trust only comes from respect and, for lack of a better word, intimacy.
- **Unconflicted:** Mentors should never be in a position of conflict or influence with respect to their protégé. While it is true that many successful mentoring relationships do not obey this rule, such relationships can never reach their full potential due to the constraints placed on open discussion.
- **Mutual benefit:** Mentoring benefits for the protégé are generally well understood. But interestingly, mentors also invariably find these to be highly satisfying and rewarding experiences. For myself, as a past mentor to a very large number of university students, I found that being a mentor challenged me, kept me sharp, and kept me connected with, and informed about the needs and issues of young academics.

Clearly these four characteristics, while arguably some of the most important, only touch the surface of what makes a healthy mentoring relationship.

Conclusion

Mentoring is a timely and valuable activity in the maritime industry, yet it is underutilized due to operational constraints. All mariners and shore-side workers are encouraged to share their expertise by engaging in mentoring relationships whenever possible. The benefit to all participants and to the industry as a whole is enormous.

For further information, contact Murray Goldberg at: Murray@MarineLS.com

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Alert!
The International Maritime Human Element Bulletin

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Mentoring

With mixed nationality crews and crewing itself reduced to the absolute minimum on many ships, those persons who would once have been available to offer professional guidance and coaching no longer have the time to do so. Trainees are therefore finding it increasingly difficult to discuss job-related issues or their career aspirations with anyone on board.

Mentoring is a work related or professionally based partnership between two people which gives them the opportunity to share their professional and personal skills and experiences, and to grow and develop in the process. It is based upon encouragement, constructive comments, openness, mutual trust, respect and a willingness to learn and share. Typically, mentoring takes place between a more experienced and a less experienced person in a totally confidential environment.

Mentoring is an ongoing relationship that can last for a long time; it can be informal and meetings can take place as and when the mentored individual needs some guidance and/or support. It can be long term and takes a broad view of the person. The Agenda is set by the mentored person with the mentor providing support and guidance to prepare him/her for future roles.

Benefits to the mentored person are:

- Development outcomes which may include, knowledge, technical and behavioural improvements
- Better management of career goals
- Developing wider network of influence
- Increased confidence and self-awareness which helps build performance and contribution

Mentors also benefit from the satisfaction of passing on their knowledge, skills and expertise.

Mentoring at Sea The 10 Minute Challenge

Introducing The Nautical Insitute's most recent publication, André explains why mentoring is so vital - and why it is a role that everyone should be ready to take on

Captain André L. Le Goubin MA FNI
STS Mooring Master

I have, for a number of years, been concerned that experiential knowledge (knowledge gained from experience and reflected upon) is not being transferred between seafarers onboard today's modern merchant ships as it used to be, by mentoring.

In 2006 I began to research this in partnership with The Nautical Institute and Middlesex University in London for a Master of Arts degree, which I gained in 2009. The purpose of my research was to show that if experiential knowledge was not transferred from senior to junior officers on board modern merchant navy vessels by mentoring, this could be a contributory factor in marine accidents. I also wanted to identify the barriers that were preventing this transfer of knowledge and to provide practical suggestions to help re-establish the flow of knowledge. My book on mentoring began life based on the findings of that research.

In addition, it was (and still is) my aim to engage the maritime community in conversations about mentoring and the transfer of experiential knowledge. For, although you may not agree with what I say, the very act of disagreeing is engaging and helps to raise the profile of the mentoring debate.

Through this research I was able to more clearly:

- Understand where the gaps in knowledge at sea are;
- Identify the causes of these knowledge gaps;
- Develop some practical measures to help re-establish the knowledge flow.

Since finishing my degree in 2009, I have developed this research and have investigated the many ways that companies, institutions and individuals transfer their experience to others. I am now in a position to pass my findings on.

Onboard mentoring

I am not a professional writer and this, most definitely, is not a text book. I am an ordinary mariner who is very concerned about mentoring and who would like to have a conversation with you about it. As you read this book, I would like you to imagine that I have come on board your ship or to your place of work. I am with you on the bridge, in the machinery control room or in your office, having a discussion on how, between us, we can improve life at sea for today's seafarers, by sharing experiential knowledge for the benefit of ourselves and those who will come after us.

We have started chatting about mentoring, as often happens to me. You will have your views and I have mine – I respect that. In this book you will find as many questions as there are answers, but that is no different from any conversation that takes place. All I hope is that you will read my book and, although you will probably not agree with all of its contents, you will find some of it thought-provoking and be challenged to pass on some of the knowledge you have gained to someone else. For that is what it is all about. If that happens, then I will have achieved my objective.

Why do we need to do this? In the 1980s, when I was sailing deep sea, knowledge transfer between ranks took place as a matter of routine. Most officers were happy to train their potential successors and conversely, most officers understudied their immediate superior in preparation for moving up through the ranks. Much has changed

within our merchant fleets since those days and, I believe many of those changes are presenting barriers which are preventing this traditional flow of experiential knowledge. In the book I look closely at what I consider to be the main barriers and then offer you some solutions on how to overcome them in today's modern Merchant Navy.

The time issue

I can imagine many of you are now wondering where the time is going to come from to undertake this knowledge transfer. Perhaps you are thinking you are so busy you just don't have time to teach others what you believe they should already know. I am not suggesting you take the place of a college lecturer, remember that it is experiential knowledge I am asking you to share. The title of my book, is in two parts, Mentoring at Sea - The Ten Minute Challenge. That is all it takes - just 10 minutes of your time, the time it takes to drink a cup of coffee or smoke a cigarette. I do not accept that you cannot give up that amount of time each day.

Consider for a moment the operation of a vessel as a whole and how much we have to learn to become successful operators of that vessel. The normal programme for cadets around the world these days comprises 3 or 4 years at university, followed by 12 months sea time. Can we learn enough in a classroom? I don't think so, even with the highly sophisticated simulators available in today's educational establishments. Much has still to be taught (or experienced) on board to supplement the foundation of knowledge obtained ashore. And it is not just cadets I am concerned about, it is every seafarer moving between the ranks right up to Master or Chief Engineer. Indeed, it may actually be the Master or Chief Engineer that is in need of the experiential knowledge.

Who should be teaching?

But who is going to do this teaching, how and when? This is where we need onboard mentors operating in an informal system of experiential knowledge transfer, to allow candidates to experience operating a vessel under the close supervision of an experienced person. This is where I am asking for your help, just 10 minutes at a time.

Imagine the difference it would make if every seafarer took just 10 minutes out of their busy schedule each day to pass on a piece of their knowledge to another seafarer. The volume of knowledge transferred would be huge and, in my opinion, would make an immediate and significant difference within our maritime community.

For me, learning is a lifelong occupation and, as masters of our trade, I believe we have a duty to pass this learning on. I also believe that the young seafarers following on after us have a right to our knowledge. There is a limit to what can be taught at any maritime establishment and it is we who must fill in the gaps for them.

Perhaps you are working ashore and reading this? I am conscious that you may want to make a difference and help with mentoring onboard. This book is not just for those at sea, it is for every member of the maritime community. I believe we can all make a difference, no matter what your position within the community.

I hope that you enjoy the book, are challenged by it and that you will engage in the conversation on mentoring. More, I hope that you will just take 10 minutes out of your busy schedules to pass a piece of your knowledge on. By doing so, you will be continuing a process that is as old as seafaring itself.

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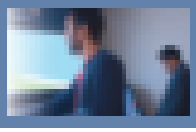
Education, training & development
Page 4-5



Occupational Standards
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The International Maritime Human Element Bulletin

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Alert!

Education, training & career development crucial for safe operations

Once upon a time, the majority of those who went to sea did so because they wanted to be the master or chief engineer of a ship - others simply wanted to go to sea. Very few had aspirations towards a career ashore, at least not until after they had completed a few years at sea, and then they would have to retrain for that new career, and return to the bottom rung of the progression ladder.

They all served a predominantly seagoing 'apprenticeship', following a work-based programme of study, leading towards a certificate of competency. The emphasis was on practical ability and on nautical and engineering knowledge and skills. 'Career development' for many meant a gradual progression up the promotion ladder until they reached a level commensurate with their own ability; for others, it meant achieving the ultimate goal of becoming master or chief engineer, or moving into shore management.

Today, an increasing number of complex and technologically advanced ships and systems, coupled with a global maritime workforce comprising of many different nationalities and cultures, can present many challenges in terms of education, training and career development.

The STCW Code requires that all seafarers should be properly qualified for the position that they hold on board, and the ISM Code requires the Company to define the responsibility, authority and level of competence required of each crew member. And, instructors, supervisors and assessors are required to be 'appropriately qualified.' But these are minimum sets and are not sufficient to cope with the systems aboard many of today's ships.

It is therefore incumbent on the ship owner or ship manager to adopt best industry standards in respect of the recruitment and training of seafarers; and to ensure that they receive the training necessary for them to carry out their duties - including the operation and/or maintenance of technically complex and multi-discipline systems. They must also be regularly updated, tested and drilled, through programmes of on-job and continuation training.

Those who are involved in the front line of shipping operations ashore must also be properly trained, adequately experienced, skilled and competent, commensurate with the level of responsibility and account-ability that they require to perform their duties. Of equal importance, is the need for maritime college lecturers to be properly qualified to teach those competencies for which they are employed to teach, and to have an up to date appreciation of modern day ship operations and of the new technology aboard ships.

There is also a need to assist and encourage today's seafarers in fulfilling their career aspirations, whether this be preparing them for promotion onboard or into shore management; or even directing them towards a programme of post-graduate education or advanced skills training to allow them to diversify into the wider maritime sector.

In difficult fiscal times, such as exist today, it is all too easy to move education, training and career development down the list of priorities. But, if it happens, the maritime industry will surely suffer an acute shortage of properly trained, skilled, competent and experienced people, both afloat and ashore. This will undoubtedly lead towards an unacceptable decline in standards and an increase in accidents at sea.

Through the **Alert!** Project, we seek to represent the views of all sectors of the maritime industry – contributions for the Bulletin, letters to the editor and articles and papers for the website database are always welcome.

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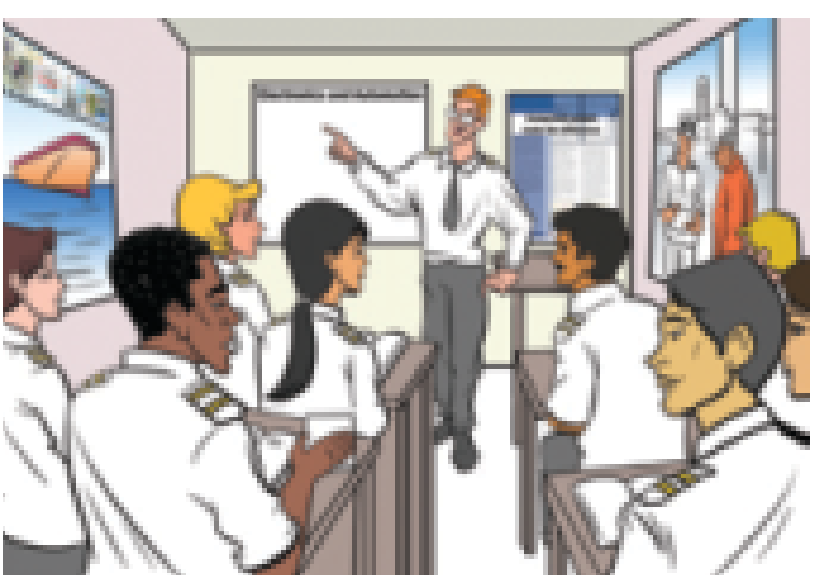


The value of onboard training

Capt Ajay Varma, *Auditing & Training Superintendent, Kline Ship Management (Singapore) Pte Ltd*

Once a seafarer has undergone a rigorous selection process, the onus of continuous training and upgrading of skills is incumbent upon the company. A gap exists between 'available skill levels' and 'company requirement' from its seafarers, hence the need for the company to step in with training.

So, with a strong focus on training, all our ships going for dry docking have undergone an increase in the number of berths and lifeboat capacity to accommodate additional trainees. While shore based training is provided at in-house Institutes and during annual Seminars, onboard training is conducted in a number of ways:

On Job Training (OJT) is conducted by auditing and training superintendents, who ensure that any shortcomings observed are rectified through education and training. Each officer is quizzed about his job, and any shortcomings identified form the basis of OJT.

Training modules for passage planning, GMDSS operations, chart corrections, ECDIS, safe launching and recovery of lifeboats, starting and maintenance of important machinery etc. are exhibited. Accidents and near misses within the fleet are discussed. A couple of hours each day are set aside for this training. General value-added training is conducted to supplement shore based training, and various drills are conducted and best practices shared during de-briefing.

We also have a training ship with more than 10 additional berths; 'on board trainers' board together with a group of trainees, and for periods of up to 3 months the trainees have the exclusive attention of the trainers.

Deck cadets and trainee engineers are given competency based weekly assignments; seven questions are put up each week, one from each subject area, starting from their first week on board. On board books and equipment manuals are consulted and they email their answers weekly, to be corrected by shore staff. Care is taken in the selection of questions which are not theoretical but based on actual usage and comprehension. The aim is to make the trainee ready for his next rank. This 'Mentoring' process ensures that we have skilled future officers, and the project has been so successful that trainee seamen and wipers have volunteered to join the program.

Prior to promotion, each officer has to undergo 'pre-promotion training'. This is a set of competency based jobs which are undertaken under guidance of a senior officer to help smooth change to the next rank. The response has been quite encouraging. Uniform competency levels are being achieved and the new promotees are confident and 'in sync' with company requirements.

There has been a significant reduction in the number of accidents, and in flag and port state vetting observations and deficiencies. Feedback received from seafarers has been quite positive, and there is a sense of belonging which has been evident in higher than industry average retention rates.

People: Mind, Body & Spirit The 7 needs of the mariner

MIND

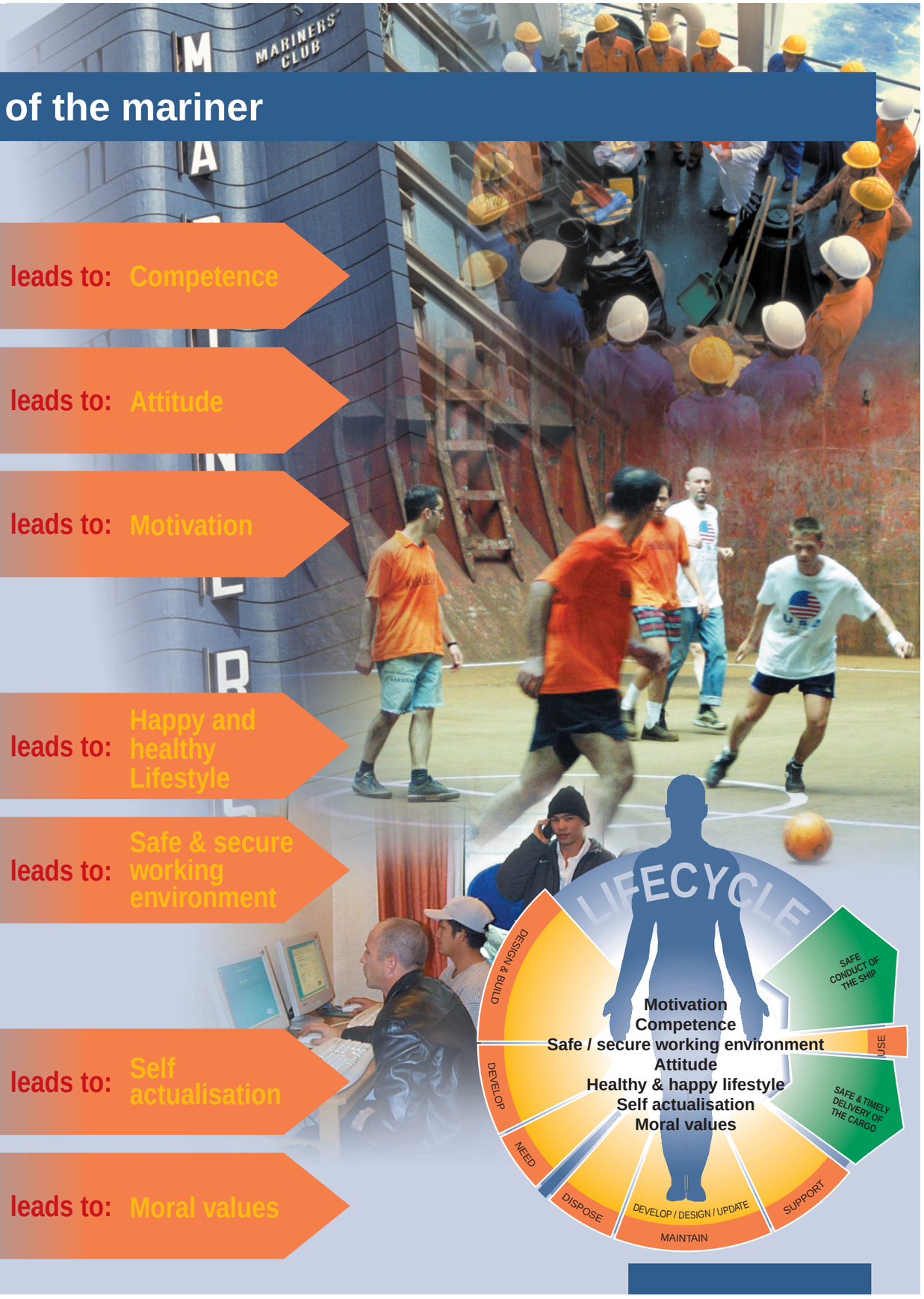
Driver	Education, training, competencies	motivator:	Knowledge, understanding, aptitude, skill, proficiency	leads to:	Competence
Driver	Self awareness, self evaluation	motivator:	Mental ability, intelligence, personality, character, sensitivity	leads to:	Attitude
Driver	Communication, direction, teamwork, empowerment, character building	motivator:	Leadership interoperability, adaptability	leads to:	Motivation

BODY

Driver	Balanced diet, habitability, hygiene, exercise, rest, recreation, medical screening, D&A testing	motivator:	Energy, physical fitness, physical strength, stamina, wellbeing	leads to:	Happy and healthy Lifestyle
Driver	Ergonomics, safe working practices, protective equipment, physical security	motivator:	Safety culture, security awareness	leads to:	Safe & secure working environment

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	leads to:	Self actualisation
Driver	Religious belief, faith, self discipline	motivator:	Cultural awareness	leads to:	Moral values



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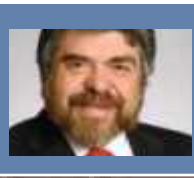
The Nautical Institute

Lloyd's Register

Cracking the code - ISM Code, the key issues
Page 3



Exploring Human Factors
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The International Maritime Human Element Bulletin

Issue No. 2 January 2004

Alert!

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.

Improving the awareness of the human element in the maritime industry

SOLAS onboard drill requirements

Chapter II-1: Construction – structure, stability, installations

Regulation 24
Marking, periodical operation and inspection of watertight doors, etc., in passenger ships

2.1 Drills for the operating of watertight doors, sidescuttles, valves and closing mechanisms of scuppers, ash-chutes and rubbish-chutes **shall take place weekly**. In ships in which the voyage exceeds one week in duration a complete drill **shall be held before leaving port**, and others thereafter **at least once a week during the voyage**.

2.2 All watertight doors, both hinged and power operated, in main transverse bulkheads, in use at sea, **shall be operated daily**.

Chapter II-2: Construction – fire protection, detection, extinction

Regulation 15
Instructions, on-board training and drills

2.2 On-board training and drills

2.2.4 On-board training in the use of the ship's fire-extinguishing systems and appliances shall be planned and conducted **in accordance with the provisions of regulation III/19.4.1**.

2.2.5 Fire drills shall be conducted and recorded **in accordance with the provisions of regulations III/19.3 and III/19.5**.

3 Additional requirements for passenger ships

3.1 Fire drills

In addition to the requirement of paragraph 2.2.3, fire drills shall be conducted in accordance with the provisions of regulation III/30, having due regard to notification of passengers and movement of passengers to assembly stations and embarkation decks.

Chapter III: Life-saving appliances and arrangements

Regulation 19
Emergency training and drills

2.2 On a ship engaged on a voyage where passengers are scheduled to be on board for more than 24 h, musters of the passengers shall take **place within 24 h after their embarkation**.

[**Note**: MSC 92 adopted amendments SOLAS regulation III/19 to require musters of newly embarked passengers prior to or immediately upon departure, instead of "within 24 hours", as stated in the current regulations. The amendments are expected to enter into force on 1 January 2015.]

2.3 Whenever new passengers embark, a passenger safety briefing **shall be given immediately before sailing, or immediately after sailing**. The briefing shall include the instructions required by regulations 8.2 and 8.4, and shall be made by means of an announcement, in one or more languages

likely to be understood by the passengers. The announcement shall be made on the ship's public address system, or by other equivalent means likely to be heard at least by the passengers who have not yet heard it during the voyage. The briefing may be included in the muster required by paragraph 2.2 if the muster is held immediately upon departure. Information cards or posters or video programmes displayed on ships video displays may be used to supplement the briefing, but may not be used to replace the announcement.

3 Drills

3.2 Every crew member shall participate in at least one abandon ship drill and one fire drill **every month**. The drills of the crew shall take place **within 24 h of the ship leaving a port if more than 25% of the crew have not participated in abandon ship and fire drills on board that particular ship in the previous month**. When a ship enters service for the first time, after modification of a major character or when a new crew is engaged, these drills shall be held before sailing. The Administration may accept other arrangements that are at least equivalent for those classes of ships for which this is impracticable.

3.3 Abandon ship drill

3.3.3 Except as provided in paragraphs 3.3.4 and 3.3.5, each lifeboat shall be launched with its assigned operating crew aboard and manoeuvred in the water **at least once every three months** during an abandon ship drill.

3.3.4 Lowering into the water, rather than launching of a lifeboat arranged for free-fall launching, is acceptable where free-fall launching is impracticable provided the lifeboat is free-fall launched with its assigned operating crew aboard and manoeuvred in the water **at least once every six months**. However, in cases where it is impracticable, the Administration may extend this period **to 12 months provided that arrangements are made for simulated launching which will take place at intervals of not more than six months**.

3.3.5 The Administration may allow ships operating on short international voyages not to launch the lifeboats on one side if their berthing arrangements in port and their trading patterns do not permit launching of lifeboats on that side. However, all such lifeboats shall be lowered **at least once every three months and launched at least annually**.

3.3.6 As far as is reasonable and practicable, rescue boats other than lifeboats which are also rescue boats, shall be launched **each month** with their assigned crew aboard and manoeuvred in the water. In all cases this requirement shall be complied with **at least once every three months**.

3.3.8 If a ship is fitted with marine evacuation systems, drills shall include exercising of the procedures required for the deployment of such a system up to the point immediately preceding actual deployment of the system. This aspect of drills should be augmented by **regular instruction** using the on-board training aids required by regulation 35.4. Additionally every system party member shall, as far as practicable, be further trained by participation in a full deployment of a similar system into water, either on board a ship or ashore, **at intervals of not longer than two years**, **but in no case longer than three years**. This training can be associated with the deployments required by regulation 20.8.2.

[**Note:** MC 92 adopted amendments to SOLAS regulation III/19, on emergency training and drills, to mandate enclosed-space entry and rescue drills, which will require crew members with enclosed-

space entry or rescue responsibilities to participate in an enclosed-space entry and rescue drill **at least once every two months**. The amendments are expected to enter into force on 1 January 2015.]

4 On-board training and instructions

4.1 On-board training in the use of the ship's life-saving appliances, including survival craft equipment, and in the use of the ship's fire extinguishing appliances shall be given **as soon as possible but not later than two weeks after a crew member joins the ship**. However, if the crew member is on a regularly scheduled rotating assignment to the ship, such training **shall be given not later than two weeks after the time of first joining the ship**. Instructions in the use of the ship's fire-extinguishing appliances, life-saving appliances, and in survival at sea shall be given **at the same interval as the drills**. Individual instruction may cover different parts of the ship's life-saving and fire extinguishing appliances, but all the ship's life-saving and fire-extinguishing appliances shall be covered **within any period of two months**.

4.3 On-board training in the use of davit-launched liferafts shall take place at intervals of **not more than four months** on every ship fitted with such appliances. Whenever practicable this shall include the inflation and lowering of a liferaft. This liferaft may be a special liferaft intended for training purposes only, which is not part of the ship's life-saving equipment; such a special liferaft shall be conspicuously marked.

Regulation 26
Additional requirements for ro–ro passenger ships

3 Fast rescue boats

3.3 At least two crews of each fast rescue boat shall be trained and drilled regularly having regard to the Seafarers Training, Certification and Watchkeeping (STCW) Code and recommendations adopted by the Organization, { including all aspects of rescue, handling, manoeuvring, operating these craft in various conditions, and righting them after capsize.

Regulation 30
Drills

1 This regulation applies to all passenger ships.

2 On passenger ships, an abandon ship drill and fire drill **shall take place weekly**. The entire crew need not be involved in every drill, but each crew member must participate in an abandon ship drill and a fire drill **each month as required in regulation 19.3.2**. Passengers shall be strongly encouraged to attend these drills.

Chapter V: Safety of navigation
Regulation 26
Steering gear: testing and drills

1 Within 12 hours before departure, the ship's steering gear shall be checked and tested by the ship's crew.

3.2 All ships' officers concerned with the operation and/or maintenance of steering gear shall be familiar with the operation of the steering systems fitted on the ship and with the procedures for changing from one system to another.

4 In addition to the routine checks and tests prescribed in paragraphs 1 and 2, emergency steering drills shall take place **at least once every three months** in order to practise emergency steering procedures. These drills shall include direct control within the steering gear compartment, the communications procedure with the navigation bridge and, where applicable, the operation of alternative power supplies.

5 The Administration may waive the requirements to carry out the checks and tests prescribed in paragraphs 1 and 2 for ships which regularly engage on voyages of short duration. Such ships shall carry out these checks and tests **at least once every week**.

Text, Video, Simulations and More. What is the Most Effective Media for Maritime Training?

Murray Goldberg

Training is moving on-line - or more correctly, to a blended model. This is more than a trend. It is a move to more effective, more accessible, and more efficient education. As such, it is a move that is unlikely ever to be reversed. Therefore, as someone involved in maritime training, it is important to think about and understand what makes the difference between "good" and "not good" eLearning implementations. Because, as with all other training methods, not all eLearning experiences are created equally.

In the 18 years that I have been involved in eLearning as a researcher, instructor and LMS developer, I have been fortunate to have had a front row seat to all manner of eLearning implementations; some good, and some not so good. One of the many attributes that makes an eLearning implementation good (effective and efficient) is appropriate use of media. And by media, I am referring to the choice of text, imagery, video, simulations and even gaming - or any combination of those as ways of delivering eLearning. I have also been fortunate to have had a front row seat to a lot of discussions, and therefore a lot of opinions, regarding the use of media. What I have found incredibly surprising is that I frequently run into what I call "media bigots" - people who are of the opinion that there is a strict ordering of media. Text is worst. Images are better. Video is better still, and so on. This is a misguided opinion because each media type has its strengths and limitations. The best implementation is the one that chooses media appropriately to achieve the desired goals.

In this short series of articles, I am going to look at some of the most popular media types and discuss their relative strengths and weaknesses. This first article will introduce the subject and focus on text as an educational medium. Some of what I say may surprise you. The next article (two weeks from now) will comment on images, audio, video, simulations and gaming, and will point you to an interesting article on the use of gaming technologies for maritime training. Please click here if you would like to be alerted when I publish that and future articles (if you have not already done so). Let's get started.

Choices!

There is no shortage of choice when it comes to eLearning media types. We are all familiar with the use of text, audio, images and video in eLearning implementations. But to make the conversation even more interesting, there are other more esoteric media types such as web-based simulations, gaming and immersive environments. And just as there is no shortage of media types to choose from, there is no shortage of opinions on what constitutes the best choice. It is common to run into the opinion that the more sophisticated media types are automatically better at delivering a quality learning experience. I disagree. Each media type has advantages and limitations and the best choice requires careful consideration of your learning goals, the knowledge and skills you are training, how much training you have to do, the nature of your audience (trainees), how big your budget is, and (very importantly) how frequently the training content changes. And although we will look at individual media types, it has been found that combining media types provides the best results.

This takes advantage of the strengths of each while minimizing the limitations of any one and also serves to provide learning reinforcement which is well aligned to how we learn as humans. This is a very powerful finding which has been proven in both research and experience and I'll talk more about it in the next article.

No Significant Difference

One important fact to note before we dive into the different media types is that most research suggests that, broadly speaking, when training content is held constant, changes in delivery media create no significant difference in student outcomes or satisfaction. So, regardless of whether a course is taught in person, via traditional correspondence, on the web or using video, the outcomes are the same. This is called the "No Significant Difference" (NSD) phenomenon and it is the subject of a book analyzing 355 research reports on the subject : Thomas L. Russell, "The No Significant Difference Phenomenon: A Comparative Research Annotated Bibliography on Technology for Distance Education".

If there is no difference, then you might conclude that the best choice is to simply select the cheapest delivery mode. Sometimes this is indeed the correct thing to do, but at other times it is not. First, it is important to remember that the NSD research looks broadly at a variety of knowledge courses taught at universities. The maritime industry, however, is somewhat different than higher education in that there is also a focus on skills not generally found in higher education. The best media choices for knowledge learning are not necessarily the best ones for skills development. Secondly, although the population, on average, learns knowledge equally well from any media type, individuals often report being able to learn better from one media type vs. another. As such, the nature of your audience will influence your media choice.

Text - Yes it IS Effective!

People love to hate eLearning implementations filled with text. They are often viewed as boring, slow, sleep-inducing, and ineffective. I have a very different view of text as a learning media. Almost every complaint leveled against text as a learning media is, in fact, a criticism not of the media type (text), but of the quality of the writing. Text, written well, can be incredibly compelling. It can be fascinating! It can very effectively and very comprehensively convey knowledge. Every one of us has read outstanding examples of writing that achieved their goals. Textbooks, love them or not, have been a staple of education since the invention of the printing press. Part of the reason for their longevity is the simple fact that they are effective. So text can be an excellent instructional media - but as with any media, it must be done well to be effective. Likewise, any other media type, executed poorly, can be very boring and completely ineffective. Therefore, I consider the choice of media type, in most cases, much less important than the quality of the instruction (writing in this case) and implementation. A great implementation will be effective regardless of media type. A poor one will not.

Density

Text also has a number of advantages. One is that it is a very "dense" medium. That is, it can convey a lot of detailed information with a very small footprint. This is a two-

edged sword. The benefit is the ability to convey a lot of detail. The downside is that it is common to mistakenly pack too much material into learning resources without providing enough structure, enough time and enough supporting instruction or experience to help consolidate the knowledge. This speaks to the power of blended learning. In this case text to document and convey knowledge, plus (for example) hands-on practice to relate that knowledge to the skills it supports. So - if you have a lot of detailed information to convey, text may be a very good choice.

Self-Directed

Text also has the wonderful property of being easily searched and scanned. We take this for granted, but it is actually very powerful. Our brains are adept at quickly scanning over large quantities of text to find what we are looking for or at skipping over sections that we do not find to be relevant. When scanning in this way is insufficient, the LMS may provide the ability to search for keywords in the text. This "random access" property allows us to be much more self-directed in our learning than is the case for media such as videos which are generally neither searchable nor easily visually scannable. Therefore, if you want your trainee to easily be able to focus on the sections relevant to them and skip those which are not, text may be your friend.

Initial Cost and Ongoing Maintenance

In the cases where text is an appropriate choice educationally, it comes with another enormous advantage. Low cost. Cost is a great advantage in itself because low cost means that you can do much more with a fixed budget using text than you can with any other media choice. However, the benefit is actually much deeper. Text is not only comparably inexpensive to initially create, but even more importantly, it is inexpensive to change and update. This is in stark contrast to the cost of updating most other media types such as videos and simulations. Small changes to those are very very expensive in comparison.

We especially care about cost for any subject of instruction which is likely to need frequent updating - which, today, applies to most subjects. If you choose a media type which is more expensive to update, you may find that when budgets are tight, your learning resources will be less likely to receive updates and will progressively become less effective and less relevant. Text, on the other hand, is very quick and easy to update and correct. The typical result is that it can be updated quickly to respond to subject matter changes and user feedback. This means that text will often be more relevant, correct and up to date than its counterparts. This is very important - remember that when you use other media types, you are not only committing to an increased initial cost, but are also committing to increased maintenance costs for the lifetime of that instructional resource. Our experience at BC Ferries has been that learning materials are in constant flux due to factors such as continuous improvement, ship refits, the availability of new information and so on. To support updates we have created a simple feedback mechanism which allows all trainees and trainers to provide instant, on-line feedback when they see a needed change. The feedback goes into a workflow and the change is made in a timely fashion. The result is quick and efficient maintenance of the learning resource, leading to a high degree to confidence and buy-in.

Another important consideration is that even if the instructional subject is relatively "static" (is unlikely to change in the near term), your execution of it is unlikely to be perfect out of the gate. As soon as it is in use you are likely to think of additional information or explanation to add, and to receive suggestions for improvement. The ability to update the materials at low cost will therefore facilitate continuous improvement. High-cost materials impede this process.

Skills vs. Knowledge

Text as a media type does have some limitations. One downside of text is that it is not very useful for teaching skills. In order to be proficient at a skill, some amount of hands-on experience is critical. Having said that, every skill requires a foundation of knowledge. Therefore, teaching skills is often best achieved using a blended approach. First teach the knowledge which underlies the skill (text or other media can be used for this) and then move to a hands-on training phase where demonstration and practice take place. Simulation can also be an excellent skill acquisition and reinforcement tool. So while text alone cannot be used to teach a skill, a combination of text (or other media) and hands-on practice is often the most effective approach.

Language Barriers

Another issue with using text alone as a learning media is that trainees whose first language is different than the one used for the learning materials will have more difficulty. This is the greatest limitation of text in an our industry where participants are from all parts of the globe. English textual descriptions may be very effective for those whose first language is English, but may be less than effective for those with other linguistic backgrounds. This is a difficult problem as it is usually impossible to present a comprehensive learning program without at least some text. However, there are ways to reduce the impact of the issue.

First, where possible, translations are effective. In cases where there are only two or three languages which need to be covered, this can be a viable strategy. In this case the expense of creation and maintenance is increased, but the costs are likely still much lower than for other media types.

If translation is not viable or the audience is too diverse to make one or two translations sufficient, then supplementing the text with an audio transcription can help reduce the issue for a couple reasons. First, some trainees may have experience working in an English-language setting, but have little or no formal English-language training. Those people are likely to have greater comprehension of spoken English. Second, by providing two "deliveries" of the same content (spoken and written), you will accommodate a greater breadth of individual learning styles and language competencies. So while it will always be difficult to learn a subject using a non-native language, there are some approaches which can help.

Conclusion

Using text (vs. images, videos, etc) as an instructional medium can be highly effective and very cost efficient as long as it is done well and matched to the learning goals and audience composition. It is a dense medium (allowing deep coverage of the subject) and is very efficient to create and maintain. Having said that, text does have limitations (as do all instructional media) and therefore it is often best used in combination with other media types. We will discuss the strengths and limitations of these other media types, as well as combining media types, in the next article.

Text, Video, Simulations and More. What is the Most Effective Media for Maritime Training? - Part II

Introduction

One of the many attributes that makes an eLearning implementation good (effective and efficient) is appropriate use of media. And by media, I am referring to the choice of text, imagery, video, simulations and even gaming - or any combination of those as ways of delivering eLearning. But what media do we use and how do we use it?
Even if you are not actively engaged in writing maritime training content (though especially if you are), there are some important take-aways here that every maritime trainer should know.

This is the second article in a series that looks at the media choices we have as maritime trainers and how to best select from among those choices. In the first article, we looked at the use of text in online learning. This second article is going to continue by examining the most effective ways to combine multiple media types in the learning experiences we create, and how to evaluate the quality of the learning experiences in the training content we encounter. The next article in the series is going to look at individual media choices (text, imagery, video, simulations, gaming ...), examining the strengths and limitations of each.

If you would like to receive an e-mail notification when that article is ready, please sign up here if you have not already done so.

The Cone of Learning

As maritime trainers we've all seen, and possibly even quoted, something similar to the following information on the effectiveness of learning media and modes (copied from a university instructor's website) :

Looks like great information. Or … does it? Should we believe this? Well, it turns out that we should not! Despite how common the information is, and how authentic it may sound, it's simply not true. Not only that, but it is damaging because people routinely make media decisions based on this information and other information like it.

This is very important, so let's begin by debunking the information presented by the "Cone of Learning", above. We will then go on to discuss some simple advice on how media types can be combined for the best learning experiences.

What Media is Best? Dispelling the Myths

It is easy to believe the misinformation shown above about how much people remember based on media type. It sounds logical. So if you have taken it to heart, don't feel too badly. But if you examine it just a little more closely, the troubling signs become apparent. First - the data is simply too convenient. Real research rarely yields percentages as results that are almost all conveniently multiples of 10. Likewise - how could such numbers even exist when we know that different people learn differently? They can't. But even if you are trusting and assume that this information is simply a generalization of real research presented in a way that can easily be remembered, it turns out you'd be wrong. In fact, when looking online for the image above, I was amazed to find hundreds like it - many with different numbers and different descriptions of the "learning media".

I recently read a great paper by Cisco and the Metiri group entitled "Multimodal Learning Through Media: What the Research Says". It is available for download here. The first half of this paper examines the origins of this incorrect information. It is actually a very interesting read on how false information can be perpetuated and published as authentic - even by credible sources. Simply said, it is a bad case of Chinese whispers (also known as broken telephone, pass the message, and by other names). There was an original kernel of truth, but it was lost long ago in the chain of reproductions.

To quote the Cisco paper (I have underlined the last two sentences for emphasis):

> "**The person(s) who [incorrectly] added percentages to the cone of learning were looking for a silver bullet, a simplistic approach to a complex issue**. A closer look now reveals that one size does not fit all learners. **As it turns out, doing is not always more efficient than seeing, and seeing is not always more effective than reading**. Informed educators understand that the optimum design depends on the content, context, and the learner. For example, the bogus percentages on the cone would suggest that engaging students in collaborative learning in general would result in higher levels of learning than would a lesson where a student listens to narration or reads text about the topic. The reality is that, for the novice student engaged in basic skill building ..., individual learning through reading or simple drill and practice might be the optimal learning design. Yet, for a different learning objective – for instance, understanding cause and effect ... a simulation might be the most effective learning approach."

So - the bottom line is that every media has its place. The choice of media depends on the learner, the learning content and (I would add) even the costs of creation and maintenance. But where does this leave us in terms of helping choose media?

It turns out that there are actually two questions here. The seemingly obvious one is "what media is best for a particular learning objective or learner"? But we also need to ask a different question because it has been found that combining media types is typically much more effective than using a single media in isolation. This makes intuitive sense - if different learners learn differently, then giving them more media choices is more likely to appeal to a broader range of learners, improving average outcomes. Likewise, different media types each bring their own strengths to the learning experience. Thus combining them is likely to yield better results (as has been shown) than any one. But some combinations are better than others, and the way we combine them makes a difference.

Let's examine what the research says about combining media types.

Combining Media Types

You may recall a previous blog article I wrote which discussed whether on-line learning was effective. That article, which can be found here, cited definitive research on the effectiveness of web-based education. There were two conclusions presented there. The one that applies here is as follows:

> Conclusion number 2: Blended learning is best:
>
> "*Instruction combining online and face-to-face elements had a larger advantage relative to purely face-to-face instruction than did purely online instruction*."

In other words, blended learning creates better training outcomes than either face-to-face or eLearning alone. The type of blending referred to by the conclusion above is one example of the combination of learning media - namely face-to-face instruction

with on-line learning. But many other combinations are possible, and how we combine them makes a difference. So - what is the best way to combine media types?

The Cisco paper, cited at the beginning of this article, has surveyed the research and has summarized a set of principles which provide some very good, concrete advice on the subject. The main principles are as follows, with short comments (written by me) below each:

"***Multimedia Principle**: Retention is improved through words and pictures rather than through words alone*."

> This makes sense. Adding images to text not only provides additional information, but does so using a media with different strengths. Text allows for deep and detailed descriptions. Images help in context setting and familiarization. The outcome is improved learning.

*"**Spatial Contiguity Principle**: Students learn better when corresponding words and pictures are presented near each other rather than far from each other on the page or screen."*

*"**Temporal Contiguity Principle**: Students learn better when corresponding words and pictures are presented simultaneously rather than successively."*

> The two preceding ones are simple common sense. For media to work well together they must be presented together - closely related in time and location.

*"**Coherence Principle**: Students learn better when extraneous words, pictures, and sounds are excluded rather than included."*

> Again - common sense. Learning materials should get to the point and resist unneeded information. This is one reason adaptive learning works so well as it tends to target the learner directly with the information he or she specifically requires at that time. Check out this article on adaptive learning in the maritime industry. In my view adaptive learning is a critical tool for maritime training - more so than for almost any other industry.

*"**Modality Principle**: Students learn better from animation and narration than from animation and on-screen text."*

> This is an interesting result. Intuitively it makes sense because both animations and reading (text) require the visual attention. Using both in the same lesson likely tends to create competition for the visual attention of the learner - rendering the combination less effective.

*"**Redundancy Principle**: Students learn better when [the same] information is not represented in more than one modality – redundancy interferes with learning."*

This one is a bit of a surprise to me as I would have expected redundancy of this kind to reinforce learning. But the message is that when we combine media types, the information that each media presents should reinforce the information from the other media, not duplicate it. This finding speaks against the use of text with an audio overlay of someone reading the text to the learner - a common practice. Of course, this may still be a useful technique for some learners - especially if their first language is other than the language of instruction.

"***Direct Manipulation Principle****: As the complexity of the materials increase, the impact of direct manipulation of the learning materials (animation, pacing) on transfer also increases"*

To me the take-away from this finding is that learning outcomes are improved when the learner has some control over the learning experience. For example, allowing the learner to go more slowly, review materials, or interact with simulations all have positive learning effects for complex subjects. This is consistent with the web-based learning research I conducted in 1995 as a faculty member at UBC.

Conclusion

If you are designing a maritime learning program, this is important information to consider. But even if you are not, there are some important take-aways here which can help you evaluate learning programs you may encounter as a purchaser or trainer of maritime learning content. So far, we have learned that:

1. Despite popular belief to the contrary, text can be an excellent choice for learning content in certain circumstances.

2. There is no such thing as a "simple ranking" of media types, with one type being a universally better choice than any other. Each has strengths and limitations rendering it a better or worse choice, depending on the learner and the learning context. We will cover this point more in the next article. If you would like to receive an e-mail notification when that article is ready, please sign up here if you have not already done so.

3. Combining media choices almost always yields a better experience than the use of any one choice alone. However, the way they are combined is important, and there are some simple rules of thumb (presented above) to get the most out of our training media.

Thanks for reading, and until the next article - train well and sail safely!

Text, Video, Simulations and More. What is the Most Effective Media for Maritime Training? - Part III

Since maritime training moved on-line, people have been arguing about the best choice of media. What's better? Text? Images? Audio? Video? Simulations? What about on-line gaming? All of these can be very effective tools in maritime training.

Yet each has its strengths and limitations, and the best choice is not always the most obvious one.

This is the third in a series of articles that examines media choices in maritime eLearning. The first article in the series looked specifically at the use of text - a frequently maligned (but often excellent) choice. The second article in the series stressed the fact that there is no such thing as one-size-fits-all "good", "better", "best" when it comes to media choices. It then carried on to discuss the strength of combining media, and tips for doing so effectively.

This third and penultimate article in the series will look at media types, discussing their strengths and limitations, and providing examples of their use. In the next (and I believe final) article of this series I'd like to take a special look at educational gaming and it's potential as a tool for maritime training.

If you would like to receive an e-mail notification when that article is ready, please sign up here if you have not already done so.

Choosing Your Media

My eyes were first opened to the power of "new media" on a 1999 visit to National Institute for Multimedia Education (NIME) in Japan. There they led me into a room, roughly 10 feet cubed, where three walls, the floor and the ceiling were all projection screens. Thus, with one's back to the open side of the room, the projections created a totally immersive environment. In my case, I had a control stick in front of me, and I was able to control my virtual flight through a simulation of the Taj Mahal. It was an amazing experience with obvious learning applications, not unlike modern bridge simulators. While these kinds of simulations are very powerful, and are clearly the best choice for some learning applications, they are not automatically the best choice for every learning goal. So how do we choose?

There are many aspects to consider when choosing media. Among the top two considerations are educational effectiveness and cost.

We discussed cost in the first article of this series, so for our purposes, let's just add a reminder that maintenance of educational content can be a burdensome requirement - especially for content that requires frequent update (and almost all content fits that description). The more sophisticated media choices create a far more expensive maintenance cost. Text is easy to update, images more costly, and videos much more costly. I am not suggesting that cost should be the primary determinant. But ignoring it will inevitably lead to a "product" whose lifespan is limited - wasting the initial investment. An out-of-date learning resource will quickly lose the confidence of your learners and demonstrate that your organization is committed neither to training nor safety. This is important. Budget accordingly.

With that out of the way, let's turn to the primary consideration - educational effectiveness.

Consider Your Learning Goals First

The best choice of media is dependant on your learning goals. There are many ways to categorize learning goals, but for our purposes I have broken it into the following four simple categories (if you are a fan of taxonomies such as Bloom's, you'll recognize these as gross simplifications from the cognitive (mostly) and Psychomotor (minimally) domains):

1. Assimilation of knowledge. Here we simply have some information that the trainee needs to know. For example - what is the draught of the vessel ? (or "draft" if you prefer - see this excellent article if you've ever wondered which is correct).

2. Understand a concept. Here we are trying to teach how something works. This goes beyond a list of facts to yield an understanding of how, for example, a piece of equipment operates. This is a necessary prerequisite to being able to reason about that equipment in the face of unexpected outcomes (for example - I press the button, but nothing happens - what do I do?).

3. Be able to perform a task. Here we are trying to teach the ability to get something done, safely and effectively. Examples might be to launch a rescue craft or take a sounding.

4. Be able to reason and make decisions. Here we are preparing the trainee to make decisions and perform actions in response to novel situations. For example, given the complexities of shipboard systems, it is impossible to teach mechanistic reactions to all possible failure modes - especially when those modes result from the unexpected interactions of more than one piece of equipment.

Considering the competencies that your trainees are required to have, it is generally not difficult to list which learning goals you must accomplish in order to teach that competency. Many competencies require the fulfillment of more than one of those goals.

Let's consider the skill of donning a fire suit as an example. Although it could be argued that teaching this competency requires the accomplishment of all four learning goals, they are not weighed equally. In this case:

1. There is a reasonable amount of knowledge to learn - what the components of the fire suit are, where they are stored, how they fit together, etc.

2. There is a small bit of conceptual knowledge required - such as how the suit protects against heat.

3. The third part - the actual ability to perform the task (don the suit) is central, equal in importance to the knowledge of the components of the fire suit.

4. And finally, being able to reason is not a large requirement of donning a fire suit. Indeed, there may be issues encountered while donning which take some reasoning to resolve, but they are not a big part of the learning.

As such, the primary learning goals for donning a fire suit can safely be considered to be “Knowledge assimilation” and “Task performance”. You can use the same process to get a general idea of the primary learning goals for any competency. Once you have that list, it is time to look to the media choices.

Matching Media to Learning Goals

When you list the learning goals required for each competency, the choice of media becomes pretty intuitive. So intuitive that I almost decided not to cover it. But I decided to provide a cursory overview in the hope it might be useful. There is much more that could be said about each and I am going to make some sweeping generalizations (for which I hope you will forgive me). Having said that, you will find the basics below.

Text

Text was covered in the first article in this series. Text is a very “dense” media and therefore has the ability to convey complex and deep information, if written well (as we will assume here). Therefore as a way of conveying facts or explaining concepts, text is often an excellent choice. View an example of text used at BC Ferries to describe the various types of vessel certificates here. While text is excellent at conveying knowledge, it is much less effective at teaching a skill or the ability to reason.

Note, however, that there are very few competencies that do not have some knowledge as a core, foundational requirement. All skills and reasoning are be based in factual knowledge. As such, while textual descriptions are not always sufficient on their own, they are almost always a valuable component of a multi-media learning approach for any competency.

Keep in mind, also, that the cost of maintaining textual descriptions is comparatively very low. Therefore, where textual media does the job, it is wise to use it.

Imagery

Images, like text, are about conveying information. They can also be helpful in explaining concepts - especially in conjunction with text. Imagery can also be helpful in training simple skills. The choice of which (text or imagery) to use depends on the kind of information - and is usually pretty obvious.

A simple example of the combination of text and imagery to explain a skill can be found here - in the BC Ferries’ ERA Self-study Guide. This module explains how to take a sounding. If your goal is to provide a trainee with the ability to recognize an object or to find components of that object (a button for example), then, as they say, “a picture is worth a thousand words”. It’s also a lot faster to “read” than the corresponding 1,000 words.

Images, like text, can be quite inexpensive to update - especially if those images are simply annotated pictures (one of my personal favorite learning tools - see an example here. Note that you may have to select a vessel before you can see the page).

Other types of imagery such as graphs and process diagrams can be used to visualize complex information or processes. These still fall into the “knowledge transfer” category of learning goals, but for the right kind of information they can be incredibly effective. In addition, they are not overly expensive to maintain and update.

Keep in mind that images can almost never be used alone. At the very least, they require textual descriptions to guide the trainee in terms of what is being taught, and what to look for on the image.

Video and Audio

The strength of video (and similarly audio) is in its power to provide familiarity with an item or an environment (eg. a ship tour) and to record demonstrations. As such, while it is credible at conveying information, it is more suited to demonstrating conceptual knowledge, and more suited still to training skills. For example, it is easy to imagine a video which explains what it means to take a sounding, and then lead the viewer through the process of actually taking one.

There are some good video examples here. The top four “Standards Videos” are used to convey information and demonstrate good practice. The remaining “SEA Web - New Features and Updates” videos are good examples of teaching skills via video. These videos were created by BC Ferries for trainees and trainers.

Audio can provide benefits similar to those of video - namely familiarity with (in this case) sounds. As a good example of the use of audio, consider this page which teaches various emergency ship signals, maneuvering signals and verbal signals.

Simulation

The maritime industry has been employing simulation in training for some time. Therefore, there are a large number of excellent resources that discuss its utility in the industry. One article on the value of simulator training can be found here. Of course there are many many more excellent articles covering every aspect of the area.

As is already evident, simulator training is an outstanding vehicle for training both skills and the ability to reason in novel situations, but is not generally useful at conveying facts, and only somewhat useful at generating a conceptual understanding. Maritime industry simulation comes in many varieties including full mission bridges, engine room simulations (sometimes integrated with the bridge simulator), part-task simulators, and finally web-based (PC-based) simulations. Each has their place (and their price).

Conclusion (for now)

Each media choice has its own strengths and limitations. It is not necessarily the case that a more expensive or more sophisticated media is better for all learning application. And as covered in the previous article, combining media types (especially text with some other media type) will almost always yield better educational results than any one media alone. The bottom line is - use the media

that will do the job, keeping in mind that whatever choice you make, you'll need to now only create it, but also maintain and update it.

In the next article of this series I'd like to take a special look at educational gaming and it's potential as a tool for maritime training. If you would like to receive an e-mail notification when that article is ready, please sign up here if you have not already done so. Until then - sail safe and happy training!

About The Author:

Murray Goldberg is the founder and President of Marine Learning Systems (www.marinels.com), the creator of MarineLMS - the learning management system designed specifically for maritime industry training. Murray began research in eLearning in 1995 as a faculty member of Computer Science at the University of British Columbia. He went on to create WebCT, the world's first commercially successful LMS for higher education; serving 14 million students in 80 countries. Murray has won over a dozen University, National and International awards for teaching excellence and his pioneering contributions to the field of educational technology. Now, in Marine Learning Systems, Murray is hoping to play a part in advancing the art and science of learning in the maritime industry.

http://www.marinels.com/

http://www.maritimeprofessional.com

GAMING MEETS TRAINING – THE 'TEAMSAFETY' PROJECT

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Abstract

The positive effects on learning and behaviour realised through simulation and gaming continue to prompt the education sector to explore new ways of blending their learning methodologies. The impact of ultimate immersion entertainment gaming has also inspired the sector to invest in state of the art gaming platforms where students enter virtual worlds and simulated learning environments. These platforms have been met with considerable success and have gone some way to blur the divide between gaming and training.

Exploiting the advances in computer gaming technology, a select group of European maritime stakeholders are presently collaborating in an EU funded research project, the aim of which is to design and implement an innovative 3D virtual training platform for seafarer safety training. Trainees will be immersed in a virtual shipboard environment and undertake training exercises as part of a structured second life training programme. Assessing the effectiveness of this programme is The Nautical Institute, tasked to construct a methodological framework of evaluation to assess proof of concept.

Scholarly work in the fields of Simulator Based Training and Training Evaluation has prescribed the tools, methods and processes needed to capture, track and assess the performance of trainees undertaking simulator training. From this, The Nautical Institute has developed a unique 5 stage process that will be used to assess the effectiveness of 3D virtual training, both as a new technology and seafarer training intervention.

1.0. Introduction

Research shows that "*video games and virtual worlds are now moving into the mainstream as traditional media industries struggle to keep up with digital natives and their desire for information, technology and connectivity*" (Callaghan et al. 2009).[1] Research also suggests that "*simulation games are more effective than other instructional methods because they simultaneously engage trainees' affective and cognitive processes (Tennyson & Jorczak 2008)"* (cited Sitzmann and Ely 2010).[2] Emerging technologies continue to provide new opportunities for educators to blend their learning methodologies with innovative and highly interactive games and immersive virtual learning environments. This too has been realised in the maritime sector where simulation and gaming has been integrated into e-learning, distance learning and more recently seafarer safety training.

In November 2010, The Nautical Institute (NI) was invited to become a partner of the EU funded research project 'TeamSafety' (http://www.team-safety.eu/), the aim of which is to design and implement an interactive 3D virtual training (3DVT) platform to enhance seafarer safety training. The platform aims to provide for a wide range of dynamic training scenarios, particularly suited to leadership and teamwork skill development, a new requirement of the STCW convention[3]. It is proposed that the simulator platform will be driven by a state of the art gaming engine and be capable of hosting a multitude of interface devices that allow for a highly realistic, immersive virtual world to be created in which seafarer skills may be individually and collectively trained.

The role of NI in this project is to propose a methodology by which the effectiveness of 3DVT can be measured. To achieve this, a review of prominent models and methodologies employed in simulator based training (SBT) was carried out whilst an appraisal was made of the functions of training evaluation widely recognised and used in business today. By aligning existing models and research designs with the learning aims and objectives of TeamSafety training, NI has developed an assessment methodology designed to capture the data necessary for training effectiveness to be evaluated.

2.0. Games, Serious Games and Virtual Worlds

Over the past 40 years, the field of simulation and gaming has seen spectacular development, both in the variety and richness of the types of games in the public domain as well as the spectrum of applications and users to whom these games have found favour. This is reflected in the overwhelming attention now paid to simulation and gaming in books, periodicals, journals, newspapers and popular broadcast media (Crookall 2010)[4]. Driving this expansion is undoubtedly the gargantuan profits realised by the gaming industry, perhaps best captured by a global headline in 2008 that the 'open world' game *Grand Theft Auto IV* took the title of the most successful entertainment release in history. Within 24 hours, it had grossed $310m, more than history's most successful book (*Harry Potter & The Deathly Hallows*, $220m) and film (*Spider-Man 3*, $117m) (Chatfield 2009).[5]

The development and profitability of the games industry from a small focused market to a large mainstream sector has paralleled the technological advance and accessibility of

[1] Callaghan, MJ., McCusker K., Lopez Losada, J., Harkin, JG. and Wilson, S., 2009. Integrating Virtual Worlds & Virtual Learning Environments for Online Education. Intelligent Systems Research Centre, University of Ulster, Northern Ireland, UK. Available from: http://www.mendeley.com/download/personal/12110091/4677172895/51b5fa9c3fe6d043b60ca30a3eda74b1a3056fa3/dl.pdf. [Accessed 17th February 2012].

[2] Sitzmann, T. and Ely, K., 2010. A Meta-Analytic Examination of the Effectiveness of Computer-Based Simulation Games. ADL Research & Evaluation Team. Available from: http://www.mendeley.com/library/ [Accessed 17th February 2012].

[3] International Maritime Organisation, 2011. STCW Convention and Code, 3rd Edition. Reading, UK: IMO Publishing.

[4] Crookall, D., 2010. Serious Games, Debriefing, and Simulation/Gaming as a Discipline, Simulation and Gaming, 2010. Available from: http://sag.sagepub.com/content/41/6/898.full.pdf [Accessed 17th February 2012].

[5] Chatfield, T., 2009. Videogames now outperform Hollywood movies. The Observer. Available at: http://www.guardian.co.uk/technology/gamesblog/2009/sep/27/videogames-hollywood, [Accessed 17th February 2012].

computers and video games consoles in the home. This development shows no signs of stopping; computer and communication facilities now afford home computer users the ability to construct and disseminate very engaging and effective games both quickly and affordably, propelling the use of games into a growing number of domains including: teaching, experimentation, entertainment, therapy and diagnosis, operations and training (Shubik 2009)[6]. Accompanying this growth is the emergence of a solid body of scholarship where theory, best practice, research and knowledge have accumulated to form a discipline now worthy of attention by the most prominent of academics, business leaders and practitioners of industry.

The seriousness of gaming or rather the games whose primary purpose is something other than entertainment are termed 'serious games', which, paradoxically some would argue are not games at all. There is much published work on the effects of gaming on learning and behaviour and whilst the body of research is heavily biased towards the negative effects (aggression, attention deficit etc.) serious games of a non violent, educational nature have achieved encouraging results[7].

Whilst the very term 'game' tends to condition the mind to associate purpose with entertainment, the function of a serious game (in an educational context) is to provide an environment through which learning or training can take place. If this environment is virtually created and designed for an avatar population, then the learner is said to enter the virtual world or second life. To enhance the level of immersion (presence) that the learner feels in second life or to enrich the gaming experience for gaming enthusiasts, a whole catalogue of human-machine interface devices (HIDs) may be used. Combining HIDs for the ultimate immersive experience in entertainment gaming is frequently showcased on television programmes (for example, 'Ultimate Battlefield 3 simulator – Teaser Trailor – The Gadget Show' available at http://youtu.be/nQR49JGySTM) and at gaming conventions whilst immersive platforms for education and training, particularly in the maritime sector, have been slower to emerge. This is undoubtedly due to smaller sector budgets and a higher risk of economic failure. However, research projects are often the catalyst for change and the TeamSafety project is a fitting example.

The maritime community is well accustomed to simulation as a feature of MET and would recognise full mission simulators for competency training and assessment. But would it recognise a 'serious game', perhaps played out on the decks of a virtual ship as simulator training? Or would it associate full mission simulation with serious gaming which, as noted above, is about the creating an environment in which to develop specific knowledge or skills?

Gaming or Training?

People working in different fields of practice have very different views on what a simulator is and what simulation purports to do. Most would agree that simulation involves some working representation of reality. A small wooden ship model, for example, may be placed on a table top to simulate a collision situation which needs to be resolved. The video game *Grand Theft Auto VI* may provide the simulated environment in which players can steal cars, tackle opponents and share game play. In both cases the various elements of a game are represented: there is engagement, rules and an outcome. Reality (to some degree) is also simulated. But whilst in both examples simulation is clearly at play, a simulator, as the maritime community would have it, is most definitely not.

[6] Shubik, M., 2008. It's Not Just A Game!!. Available at http://ssrn.com/abstract=1263475 [Accessed 20th February 2012].
[7] Barlett, C., Anderson, C. and Swing, E., 2009. Video Game Effects – Confirmed, Suspected and Speculative, A Review of the Evidence, Iowa State University. Available at http://www.public.iastate.edu/~cpb6666/pubs/09BAS.pdf. [Accessed 20th February 2012].

It has been suggested that "*simulation is all in the mind, not in some intrinsic quality of the objects that we employ in the simulator*" (Crookall 2009)[8]. This accords with research that has shown "*high fidelity simulators can actually hinder effective training and learning because it over stimulates novice trainees*" (Feinstein and Cannon 2001).[9] It might be inferred then that the level of realism (fidelity) of the simulation to the learner is of less importance than the perception of realism fostered by the learner in the simulation. It therefore follows that full mission simulation would most usually be offered to seagoing officers *after* basic navigational competences have been acquired. This may also explain why assessing knowledge of the collision regulations using wooden ship models on a table top remains such an effective tool in maritime education today.

The constructs of a simulation may embody the very primitive (wooden ship model) to the highly immersive (mission simulator). What is recognised here is not the hardware or perfection with which reality is replicated, but the competences targeted for training and the level of trainee for which the simulation has been selected. A gross mismatch of the two will undoubtedly compromise the outcomes for which the simulation exercise has been designed.

For mission simulators and the competences they are designed to train, the perfection with which reality is replicated *does* matter. Some researchers claim that the effectiveness of SBT rests on the fidelity, verifiability and validity of the simulation. Feinstein and Cannon (2001) explain that "*verification is making sure that a simulator operates the way it is intended while verifiability is about eliminating errors in the simulator model through testing by subject matter experts. Validity refers to how well the simulator accurately reflects real world results and how its responses are based on the manipulations of the user*" (cited by Nash and Smith 2010)[10]. For the TeamSafety project, it can be seen that fidelity, verifiability, and validity are three key factors that will lend credibility to the virtual scenarios it is designed to play out. In turn, this will influence the engagement of trainees and effectiveness of the training both to individuals and training group as a whole.

A high fidelity, validated and verified simulator platform make up just two components of a simulation. To effectively engage cognitive and affective processes in the trainee and foster a learning environment, a third component is needed; pedagogy. The distinction perhaps between a serious game and a simulator lies with human intervention for a trainee needs not only a contextualisation of the simulation but also input from an instructor who is trained to track and assess performance before, during and after the simulation. This, many argue, is most important as the instructor is able to schedule the reflection on and sharing of simulation experience, which can be turned into learning - a notion articulated most by David Kolb in his experiential learning theory[11]. The three components of a simulator in a maritime context may therefore be pinned to software, hardware and human ware, the latter of which serious games most often come without.

3.0. The TeamSafety Project

Under its 7th Framework programme 'Research and Innovation', the European Commission granted a consortium of pan European partners, including NI, the resources necessary to research, design, develop and disseminate a 3DVT platform for use in MET. The overarching aim of the platform is to enhance the safety of shipping and minimise

[8] Crookall, D., 2010. Serious Games, Debriefing, and Simulation/Gaming as a Discipline, Simulation and Gaming, 2010. Available from: http://sag.sagepub.com/content/41/6/898.full.pdf [Accessed 17th February 2012].

[9] Feinstein, A. and Cannon, H., 2001. Fidelity, Verifiability and Validity of Simulation: Constructs for Evaluation, Wayne State University Marketing Department Working Paper 2001-006. Available at http://sbaweb.wayne.edu/~marketing/wp/008HC.pdf. [Accessed 21st February 2012]

[10] Nash, D. and Smith, R., 2010. Evolving Best Practices through Simulation Based Training – Training the Field Operator of the Future, Control Station Inc. Available at http://www.controlstation.com/files/file/Evolving%20Best-Practices%20through%20Simulation-Based%20Training.pdf. [Accessed 19th February 2012].

[11] Kolb, A. and Kold, D., 2008. The Learning Way : Meta-cognitive Aspects of Experiential Learning, Case Western Reserve University. Available at http://learningfromexperience.com/media/2010/08/Kolb_Metacognition-EL.pdf. [Accessed 21st February 2012].

interruption to EU businesses by improving human performance and reducing the incidences of human error at sea, the cause of a reported 80% of all maritime accidents (Gregory and Shanahan 2010).[12]

The platform aims to provide for a wider range of dynamic training scenarios than would be possible with conventional mission simulators, a feature of particular importance with incoming requirements of the STCW convention for leadership and teamwork training. Another area where the platform is planned to offer unique training capabilities is the simulation of crowd behaviour (for example, cruise ship passengers) using avatars resident in the virtual world. This would be especially useful with crisis management, crowd management and human behaviour courses as relevant scenarios for this type of training are most difficult to simulate.

The simulator platform will be driven by a state of the art gaming engine and may be connected to an array of HIDs which collectively serve to stimulate multiple sensory inputs and enhance the interactive and immersive experience of the trainee. The platform, like any mission simulator, would become a mere tool in the box of a competent instructor tasked to deliver a bespoke training programme with pre defined learning aims, objectives, exercises, outcomes and assessment criteria.

Gaming Meets Training

Trainees undertaking exercises on the TeamSafety training platform become 'players' of a very sophisticated, highly interactive first person simulation 'game'. They are represented in world by an avatar, visible only to the instructor and other trainees (in the case of team training). Communications between instructor and trainee(s) are live and movement in world is controlled by the trainee using a unique game control pad. Crowd behaviour on the other hand may be simulated by an instructor who introduces 'dumb' avatars to the scenario as a scripted event.

For prototype development, key areas of a merchant ship have been modelled to create a virtual shipboard environment. It is proposed that trainees will fill the roles of key crewmembers onboard and through completion of specially designed training scenarios, develop a greater understanding of and skill in leadership, teamwork, effective communications, incident command and control.

Thus, the TeamSafety platform is not an attempt to replace the tools and equipment used on conventional 'hands on' STCW training courses, for example fire fighting and survival craft training. Rather it is designed to supplement those tools by targeting high level tactical and strategic decision making skills, leadership qualities and effective team working among those who go to sea.

4.0. Assessing Training Effectiveness

The role of NI in the TeamSafety project is that of exploitation and dissemination manager. A core focus of the exploitation strategy is to assess the effectiveness of TeamSafety training by implementing an evaluation methodology that will capture, interpret and assess the performance of trainees enrolled in the training programme. By further tracking the knowledge, skills and attitudes (KSAs) of trainees after training is complete, it is anticipated that further insight will be gained into the transfer of KSAs from the TeamSafety training room to the operational environment.

[12] Gregory, D. and Shanahan, P., 2010. The Human Element in Shipping - A Guide to Human Behaviour. April 2010, The Stationery Office. Available at: http://www.standard-club.com/docs/MCAGuidev1.0ae-2.pdf. [Accessed 21st February 2012].

In order to develop and propose a unique evaluation methodology for the TeamSafety platform it was first necessary to survey the simulator training landscape in a number of relevant fields to consider the models and methods employed in SBT today. Providing a backdrop for this research was the work of Donald Kirkpatrick who in 1959 developed a training evaluation model comprised of four levels of training evaluation.

The Kirkpatrick Model

The Kirkpatrick model describes four steps for evaluating the impact of training. It addresses four training outcomes designed to be measured in order to assess the impact of an intervention upon the individual and the organisation in which they serve. These outcomes (levels) are:

1. REACTION - an assessment of the reaction of a trainee to the training program. This is designed to capture the likes and dislikes of the trainee towards the programme of training.
2. LEARNING – provides quantifiable indicators of the acquisition of competence or learning that has been achieved
3. BEHAVIOUR – addresses the issue of learning transfer, i.e. the extent to which new knowledge, skills and attitudes are transferred to the arena for which they are intended
4. IMPACT – seeks to measure the impact the training has had on organizational goals and objectives

The popularity of Kirkpatrick's model is no doubt the ease with which the complex process of evaluating training programmes may be attempted: It identifies the pertinent questions, defines the criteria that may be appropriate and simplifies the evaluation process to one driven by outcome. It also prompts an examination of multiple measures of training effectiveness (the four levels) and draws attention of the evaluator to the importance of learning transfer in making training effective.

It is evident that the Kirkpatrick model has been influential and integral to the design and development of other models for training evaluation over the past half century, however, the model is not universally applicable and caution has been advised on the value and use of accumulated data. For example, Bushnell (1990) contends that "*Kirkpatrick's model focuses only on what happens after the training but not the entire training process*", while Kraiger, Ford and Salas (1993) contend that "*Kirkpatrick's model fails to specify what kinds of changes can be expected from the [training] program, and what assessment techniques should be used to measure learning at each level*" (cited by Chang 2010).[13]

Despite the alleged shortcomings, the model does provide a systematic way of addressing training evaluation through a straightforward language of outcomes and information that need to assessed. Its use for evaluating standalone training interventions, such as that envisaged in the TeamSafety project is therefore valid and suitable, though accepting that modifications are required to fill the gaps evidenced in scholarly work and elicited by SBT experts.

Performance Measurement in SBT

SBT provides the opportunity for both instructor and simulator to replicate a working environment in which KSAs can be acquired and transferred amongst trainees. Being able to measure, track and assess performance within that environment as well as formulate remedial feedback and account for factors that may affect the outcomes is critical to

[13] Chang, Y., 2010. An Empirical Study of Kirkpatrick's Evaluation Model in the Hospitality Industry. FIU Electronic Theses and Dissertations. Paper 325. Available at: http://digitalcommons.fiu.edu/etd/325/. [Accessed 21st February 2012].

ensuring that training is systematic. It can be seen then that SBT encompasses both a summative *and* formative approach to assessment, the latter of which is vitally important but decidedly lacking in the Kirkpatrick model.

Performance measurement is the means by which the success of a training program can be evaluated since without it, the instructor is ill equipped to formulate feedback, facilitate remedial training or conduct a fair and standardised assessment. If the learning objectives of a training programme are to be met then the 'what', 'how' and 'when' of performance measurement needs to be decided upon and clearly defined. Salas and Rosen (2007) offer a set of guidelines for best practice in performance measurement that are empirically, theoretically, and practically based.[14] They provide a set of diagnostic measures specific to SBT which are rooted in the science of learning. These guidelines are directly translatable to the TeamSafety project as they provide the cues to close Kirkpatrick's gaps and devise a methodological framework for determining the effectiveness of 3DVT. These cues may be summarised as follows:

1 Define the competencies that underlie effective performance and targeted for acquisition – the 'what' that is being measured
2 Translate the competencies into measurable learning outcomes – the criteria by which the success of the training programme can be assessed
3 For each learning outcome derive a set of specific metrics – connect performance measurement to learning objectives
4 Develop behavioural markers of performance for each learning outcome - descriptions of good or poor performance, i.e. the presence/absence of targeted competencies
5 Develop metrics that are diagnostic of performance - determining the causes of effective and ineffective performance
6 Use multiple data sources and types to capture performance
7 Capture individual and team performance – multi level analysis
8 Capture processes and performance outcome – ascertain mission success but also capture the processes of performance that led to that success
9 Integrate all of the performance measurements – for a consistent and balanced assessment
10 Link discrete behaviours to scripted events – opportunities for the trainee to exhibit the competences targeted for development
11 Focus measurement on observable behaviour – this helps to eliminate much of the bias associated with subjective assessment
12 Maintain a good ratio of instructors to trainees – raters may also observe performance so as not to over burden the instructor.

A Methodological Framework

The review of scholarly work in the fields of training evaluation and performance measurement in SBT show that the two fit together rather well and thus provide the basis upon which NI has been able to develop a unique methodological framework for assessing TeamSafety training effectiveness. Encompassing multi level diagnostic *and* outcome measures which together facilitate an evaluation of the TeamSafety training programme, NI has developed 'TECAT' – a Training Effectiveness Critical Analysis Tool. TECAT is designed to test the TeamSafety concept, both as a new technology in the field of MET and as a training intervention for seafarers. It brings together the key features of existing evaluation models and best practices in SBT and combines them with sector specific knowledge to

[14] Salas, E. and Rosen, M., 2007. Guidelines for Performance Measurement in Simulation-based Training, Institute for Simulation and training, University of Central Florida.

achieve a unique methodological framework for evaluation. This framework is summarised in Figure 4.1.

With reference to the aforementioned, it can be seen that 5 key stages or processes have been identified within the framework that each capture the quantitative and qualitative data NI requires to provide proof of concept and assess the effectiveness of TeamSafety training. These processes each comprise one or more data capture techniques that NI will use to make evidence based judgements. These include: survey, focus group, observation checklists, audio/video recording, self reporting, peer review, automatic data acquisition (ADA) and 360^{o} feedback. It is now the task of NI to implement this methodology and report its findings back to the TeamSafety project for partner review and consideration.

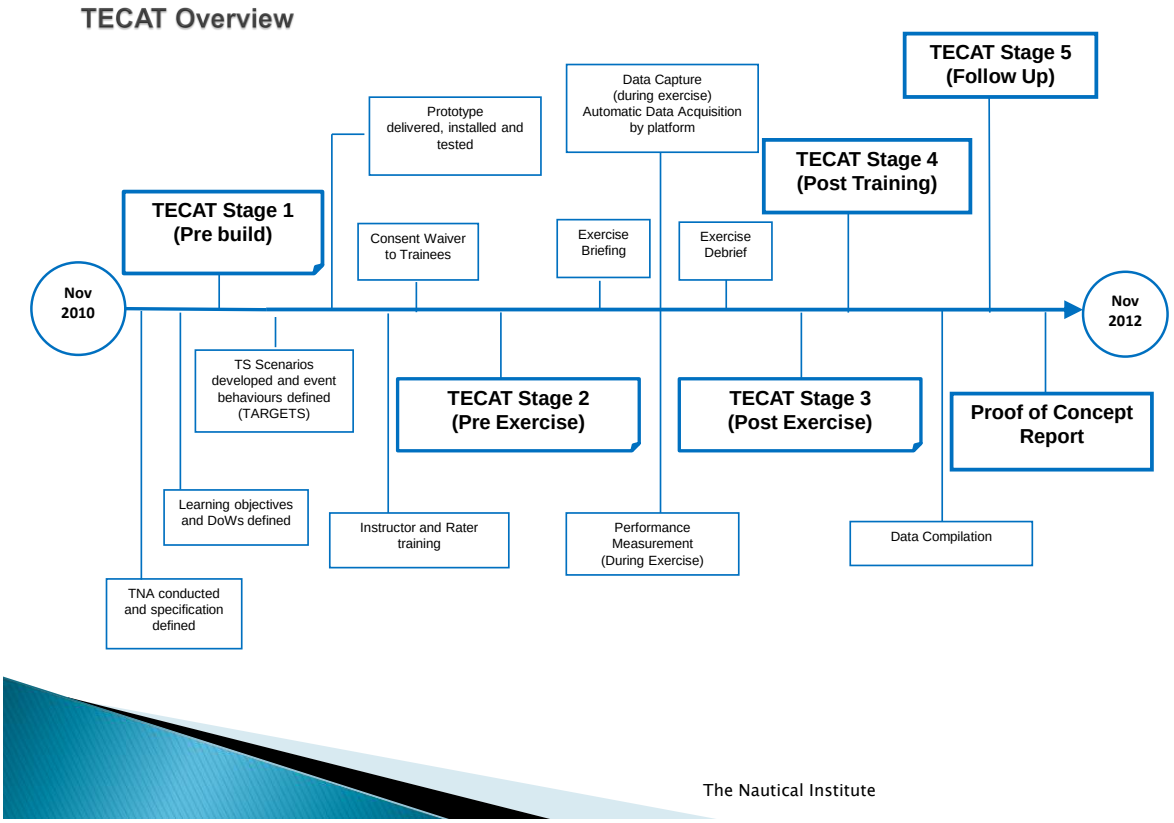


Figure 4.1 - A methodology for assessing the effectiveness of 3D Virtual Simulation Training

5.0. Summary and Conclusion

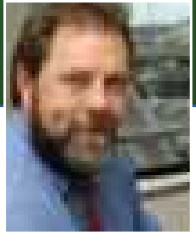
The exponential growth in the proliferation and use of social media, video games and virtual worlds in the last few years has motivated people in all sectors to look at ways of developing new interactive teaching materials and learning environments. The dissemination of serious games has stretched to more domains than ever before as their impact is being positively realised, while the frontiers of entertainment gaming wilfully advance as immersive and engaging experiences are being achieved through state of the art HIDs. Absent from this mesmerising mix of software and hardware however, is human ware in the form of an instructor, whose interventions largely distinguish gaming from training.

Whilst the objectives of a simulation must be matched to the needs and level of the trainee, it was noted that fidelity, verifiability and validity of the simulator play an important part if the

simulation is to reflect the real world and effect the acquisition and transfer of KSAs in the individual and group as a whole. Notwithstanding, the instructor is powerless to intervene or add value to the simulation unless performance of the trainee is systematically measured.

Having reviewed the ever popular Kirkpatrick model in the context of the TeamSafety project and the role of NI thereto, a number of gaps were identified. Scholarly work highlights that Kirkpatrick's four levels are very summative in nature and that diagnostic instruments were missing. To integrate formative diagnostics into TeamSafety training, consideration was given to best practices for performance measurement in SBT. By merging the elements of Kirkpatrick's model with the performance metrics offered by Salas and Rosen, NI has been able to develop TECAT, a unique methodological framework for assessing the effectiveness of the TeamSafety platform both as a new technology and as part of a new seafarer training programme.

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.

Post-Graduate Certificates
in Maritime Education and Training

Jane Japitana, *Maritime Academy of Asia and the Pacific*

We have been very lucky in the Philippines, to receive sponsorship from the International Maritime Training Trust (IMTT) for a Post-Graduate Certificate in Maritime Education and Training. The course was developed by Warsash Maritime Academy (WMA) as a year-long, part-time programme, which is accredited by Southampton Solent University.

14 professional lecturers of nautical studies, engineering and general education completed the first course in November 2008, with another 16 participants currently undergoing training.

The course comprises of 3 different modules on theory of teaching and learning, professional development and teaching practice. This Post-Graduate Certificate in Maritime Education and Training is instrumental in raising the standards of quality teaching in higher education in the formal baccalaureate degree or in the short courses.

The lecturers learn further different approaches on teaching, which equips them with the theory-based strategies. The participants benefit from the programme in terms of professional advancement.

Sharing teaching experiences with one's cohorts provides a good insight and an avenue for discussions and exchanging views on good teaching practice, assessment and lesson planning, from all the different participants. Personal reflection is highly used on the activities and assignments which helps the participants to be reflective and critically evaluative. The course helps each participant-lecturer to broaden one's perspective in teaching and to achieve the greater objective of quality education and training through quality teaching - leading to better and more competent seafarers.

Section A-I/10
Recognition of certificates

1 The provisions of regulation I/10, paragraph 4 regarding the non-recognition of certificates issued by a non-Party shall not be construed as preventing a Party, when issuing its own certificate, from accepting seagoing service, education and training acquired under the authority of a non-Party, provided the Party complies with regulation I/2 in issuing each such certificate and ensures that the requirements of the Convention relating to seagoing service, education, training and competence are complied with.

2 Where an Administration which has recognized a certificate withdraws its endorsement of recognition for disciplinary reasons, the Administration shall inform the Party that issued the certificate of the circumstances.

Section A-I/11
Revalidation of certificates

Professional competence

1 Continued professional competence as required under regulation I/11 shall be established by:

.1 approved seagoing service, performing functions appropriate to the certificate held, for a period of at least:

.1.1 twelve months in total during the preceding five years, or

.1.2 three months in total during the preceding six months immediately prior to revalidating; or

.2 having performed functions considered to be equivalent to the seagoing service required in paragraph 1.1; or

.3 passing an approved test; or

.4 successfully completing an approved training course or courses; or

.5 having completed approved seagoing service, performing functions appropriate to the certificate held, for a period of not less than three months in a supernumerary capacity, or in a lower officer rank than that for which the certificate held is valid immediately prior to taking up the rank for which it is valid.

2 The refresher and updating courses required by regulation I/11 shall be approved and include changes in relevant national and international regulations concerning the safety of life at sea, security and the protection of the marine environment and take account of any updating of the standard of competence concerned.

3 Continued professional competence for tankers as required under regulation I/11, paragraph 3 shall be established by:

.1 approved seagoing service, performing duties appropriate to the tanker certificate or endorsement held, for a period of at least 3 months in total during the preceding 5 years; or

.2 successfully completing an approved relevant training course or courses.

Section A-I/12
Standards governing the use of simulators

PART 1 – PERFORMANCE STANDARDS

General performance standards for simulators used in training

1 Each Party shall ensure that any simulator used for mandatory simulator-based training shall:

.1 be suitable for the selected objectives and training tasks;

.2 be capable of simulating the operating capabilities of shipboard equipment concerned, to a level of physical realism appropriate to training objectives, and include the capabilities, limitations and possible errors of such equipment;

.3 have sufficient behavioural realism to allow a trainee to acquire the skills appropriate to the training objectives;

.4 provide a controlled operating environment, capable of producing a variety of conditions, which may include emergency, hazardous or unusual situations relevant to the training objectives;

.5 provide an interface through which a trainee can interact with the equipment, the simulated environment and, as appropriate, the instructor; and

.6 permit an instructor to control, monitor and record exercises for the effective debriefing of trainees.

General performance standards for simulators used in assessment of competence

2 Each Party shall ensure that any simulator used for the assessment of competence required under the Convention or for any demonstration of continued proficiency so required shall:

.1 be capable of satisfying the specified assessment objectives;

.2 be capable of simulating the operational capabilities of the shipboard equipment concerned to a level of physical realism appropriate to the assessment objectives, and include the capabilities, limitations and possible errors of such equipment;

.3 have sufficient behavioural realism to allow a candidate to exhibit the skills appropriate to the assessment objectives;

.4 provide an interface through which a candidate can interact with the equipment and simulated environment;

.5 provide a controlled operating environment, capable of producing a variety of conditions, which may include emergency, hazardous or unusual situations relevant to assessment objectives; and

Occupational standards for shore-based ship management

Captain Nigel Palmer, *Chairman, Merchant Navy Training Board (UK)*

The Merchant Navy Training Board (MNTB) has recently reviewed its training programmes for seagoing Officer Trainees. The introduction of Foundation Degrees (Professional Diplomas in Scotland) in 2006 and, from Sept 2009, revamped Higher National Certificate and Higher National Diploma courses has ensured that a comprehensive range of programmes up to full Honours Degree are available.

One area that has been neglected in the past has been shore-based ship management. The MNTB has therefore developed a suite of National Occupational Standards (NOS) covering shore-based ship management occupations.

Occupational standards describe the skills, knowledge and understanding needed to undertake a particular task or job to a nationally recognised level of competence.

The shore-based ship management standards cover the activities carried out by marine, technical and engineering superintendents, fleet managers, and operational staff.

The suite covers: employing and managing marine personnel for vessel activities; ensuring vessels are procured, maintained, supplied and equipped for service; establishing and administering systems to ensure quality and continuity of service; safety and security of operations; and personal and professional management skills to support shipping services.

Once formally approved, the standards will be available to inform existing or new qualifications and for a whole range of workforce development purposes. This may involve the development of degree courses to provide development and progression opportunities for existing staff as well as a career pathway for those looking to come directly into this area of the shipping industry. In addition, organisations currently offering qualifications covering ship management activities will be encouraged to use the NOS as reference points to update their awards.

The MNTB is currently talking to a number of bodies that may be interested in developing their qualifications in line with the occupational standards. In addition, we are looking at providing a means to formally recognise awards of this nature through an endorsement process that will support the validity of the awards to the industry and to those seeking a career within it.

In addition to their use in qualifications, occupational standards provide excellent workforce development tools such as: providing clear and concise information in recruitment adverts; developing job descriptions; defining training needs; identifying training gaps; informing appraisal processes, and defining progression routes and requirements.

We will eventually have in place standards to enable the industry as a whole to recruit, train and provide defined and recognised career progression routes, linked to relevant qualifications, for all those who wish to make the shipping industry their chosen profession.

Once formally approved, the occupational standards will be downloadable from: www.ukstandards.org

For further information about the work of the MNTB go to: www.mntb.org.uk