To promote, develop and support in the spirit of cooperation, the common interests of its members in all matters concerning the development and quality of maritime education and training.

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leadership and teamwork in the shipboard environment and particularly how to facilitate learning and assessment of that learning through the use of a model course.

How, one asks, does military style training address the leadership and teamwork essential to the efficient, safe, clean, secure operation of a modern ship? Some aspects will, many others won’t.

The serious situation in New Zealand that has aroused public ire is the stranding of the containership Rena on a reef on a calm, clear night as the vessel was approaching Tauranga, a port with many miles of beautiful adjacent coastline and popular beaches. Skilled salvors are removing the bunkers remaining on board, however the hull has a major transverse crack and could break up during the next period of bad weather.

How, the public is asking, can a large ship fitted with modern navigational equipment, steer straight on to well charted rocks extending over a relatively small area? Understandably, given the pollution caused by the spillage of bunkers and containers falling overboard, the competence of the crew is being seriously questioned. This questioning was reinforced a few days after the Rena stranding by the main engine stoppage on a ship under pilotage departing from Tauranga, which resulted in her stranding briefly at the entrance to the harbour, fortunately without damage or leakage.

While the rest of the crew have been flown home, Rena’s Master and Second Mate have been arrested and face a number of charges. The general public and army personnel are assisting with the clean up of once pristine beaches. Wildlife suffering from the oil is being cared for. There will be a few days after the Rena stranding by the main engine stoppage on a ship under pilotage departing from Tauranga, which resulted in her stranding briefly at the entrance to the harbour, fortunately without damage or leakage.

The concluding paragraph is ‘Too many militaristic aspects appear to be too prevalent in MET establishments across the world, which do not address current industry debates. Whilst a select few characteristics of military training are appropriate to training techniques of MET establishments, the evidence shows that it is being used as too strict a template, with no flexibility to address any of the concerns it may raise.’

That this timely article is well worth careful reading is underscored by current GlobalMET activities and a serious situation in New Zealand, which has caused an outcry of profound public concern about the standards of operation of a large container ship.

Earlier this year GlobalMET formed a 12 person international working group to draft the text of an IMO Model Course on Leadership and Teamwork for operational level watchkeepers. Now, with the drafting in its final stages, consideration is being given to adding guidelines on leadership for management level personnel. Writing the draft text has involved a lot of thinking about what is involved in
The Department of Maritime Studies at Durban University of Technology is situated in the busy port of Durban on the east coast of South Africa. This well-positioned hub port for the eastern seaboard is known as the gateway to the South African economic heartland.

The Department of Maritime Studies offers three programme streams, namely: navigation, marine engineering and shore-based operations. The first two options are the academic components of a sea-going career path on ships trading internationally while the third option prepares students for careers in land-based operations of the maritime industry.

Both sea-going programmes are accredited by the South African Maritime Safety Authority (SAMSA) and meet the required standards of the International Maritime Organisation’s Convention on Standards of Training, Certification and Watchkeeping (STCW). In support of these programmes are laboratories equipped with part task simulation for navigation, engineering and radio communication.

The National Diploma in Maritime Studies (shore-based) is a broad based qualification, providing fundamental knowledge to enter the commercial market at management trainee level. Topics include concepts of International Trade, Maritime Law, Commercial Shipping Business, Logistics and Economics.

The Department offers a range of short courses, including: GMDSS (Global Maritime Distress and Safety Systems); Maritime Communications; ENS (Electronic Navigation Systems); Marine Motorman – all grades; Assessor Training – Level 1; and Dangerous, Hazardous and Harmful Cargoes (IMDG Code only).

The six staff members are experienced, motivated and committed to the professional delivery of high quality learning programmes.

The Durban University of Technology is strategically positioned to support the skills requirements for the ever expanding Port of Durban and surrounding industry. The port of Durban is the busiest in Africa in terms of volume and value of general commodities.

The Department of Maritime Studies embraces the current objective of the Durban University of Technology in “Making Knowledge Useful”.

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Maritime Education and Training for Future Ships: Challenges and Rewards

By

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Abstract
The Modern Maritime Education and Training system has become quite complex and ever demanding in order to meet recurring challenges due to the evolution of rapid changing technology and the fast adoption of integrated system technologies involved. In this scenario, a straightforward traditional approach cannot be implemented to achieve a perfect syllabus on the basis of the ongoing procedures. A continuous watchdog system on the best practices is required for the achievement of an ever ascending set benchmark.

The prime intention of this write-up, besides giving an overall brief analysis of the maritime education and training for the future ships, is to discuss the challenges and interesting and exciting aspects of implanting an innovative approach in the new generation of maritime professionals. The evolving IT backed new technologies, blended with main and auxiliary machinery operations, cargo handling system, navigation and communication equipment will certainly enhance the current maritime safety and security performance and the performance of operational and management personnel of the future vessels. The future vessels are likely to be built with the state-of-art hull design combined with intelligent, aesthetic design of machinery, power plant, cargo handling equipment, communication system and instruments.

The general awareness on the maritime environmental protection and regulatory system will create a positive attitude and sense of responsibility towards the true professional pride.

The most relevant points are:
♦ Past and current scenario of maritime education and training.
♦ What should be the optimum level of implementation of technology for effective maritime education and training in order to create the best lot of personnel for the management and operational staff onboard and groom them with leadership qualities and teamwork mentalities?
♦ How such type of education and training can be organized and structured so that intended results are achieved?
♦ How can we innovatively assess the results of the desired level of education and training?
♦ How do we successfully integrate the maritime education and training for engineer officers and navigating officers to enable them accept the cross departmental responsibility in the management and operational aspects without reservation and reluctance?
♦ How to create a new generation of ratings compatible with the techno-savvy officers, grooming each with high morale?
♦ How to address the above concerns effectively to achieve the goal in a cost effective manner with the least financial burden on relevant parties?
♦ Emphasis on safe and efficient running of the vessels in the current regulatory regime without over-burdening the onboard personnel.
♦ Future virtual maritime universities - true globalization of maritime education & training.

Introduction
The result oriented, holistic and effective maritime education and training, embedded with modern technology, commitment, pride and high morale will be the foundation pillar for maintaining the safe, efficient and reliable fleet of vessels in future maritime transportation links. The complexity of maritime business operations and extremely high stakes mandatorily demand people of high calibre, intelligence, skill, competence, education and training.

Gone are the days when shipping and seafaring professionals could be selected just like that. With the rapid progress of oil and gas industry, the introduction of FSO, FPSO and FLNG Facilities, maritime industry, the maritime profession is not as simple as in past decades. Though the learning is a difficult concept to define and gauge it is an even more difficult task. A sizeable number of students have no greater understanding of their subject at the end of their course than they did at the start of their curriculum, and this is also true for maritime students and ‘would be’ professionals.

Researchers’ findings reveal that quite a few students seem to be learning an imitation of at least some of the subjects they are studying, a counterfeit amalgam of terminology, algorithms, irrelevant facts, ‘mugged-up answers’ and manipulative skills, that enables them to survive the process of their ‘learning’ assessment.

Objectives
It would be appropriate here to define and establish the philosophy of learning and select the most suitable theory of learning for the maritime students of modern times. The learning is more than ‘right answers’ and irrelevant facts. In simulator based courses, it is often aimed for attitude and behaviour change as well as cognitive change. Thus, it is noted that simulator based courses are ‘fairly well’ successful in certain areas of maritime education and training. In general, there are two approaches to understand the student learning, i.e.-
♦ Constructive or Cognitive
♦ Phenomenography
The constructive approach is an evolution of cognitive psychology; it promotes the idea that what students do in terms of mental processing is important for learning. It is the integration of knowledge, intellectual skills, interest, attitudes, values, manipulative and motor skills.

The phenomenography approach is a theory of learning that places at its centre the student experience. The learning in students cannot be isolated from the social context in which the learning takes place. The quality of the interaction between teachers and students is vital to a learner’s development.

The objective here and onwards in this article is focussed on implementing the best techniques and education curriculum for the future maritime education and training to get an inflow of the right talent and willing seafarers fully committed to their profession in all-weather-conditions.

Maritime Education and Training: Course Design and Relevant Applicable Theory of Learning

In the maritime industry, the course goals might be different according ‘to whom it may concern’. As such, the students, employers, professional bodies, lecturers and government agencies are all stakeholders in the maritime education system and each has different needs and perspectives. It is the holistic responsibility on course designers and program planners to be vigilant of these stakeholders’ expectations and requirements, but not be deviated against their better judgement when it comes to coverage.

To make the learning in maritime education and training a ‘talent puller’, and possibly in the process facilitate the marketization of education, syllabus planners need to make explicit what their courses are offering and how that can be evidenced. If goal or aims indicate the intentions of a course, then learning outcomes, as the name suggests, are the indicators that the intentions have been realized, i.e. the learner has learnt what was intended.

Pertaining to continuing education and training for seafarers, generally the questions are asked by the employers about the ‘value-added’ of the courses that their officers attend. They want to know that at the end of the course, an officer will have learnt what he or she needed to learn, and can apply the skills practised at the training institution, onboard the ship or marine facility. The course purchasers’ expectations need to be assured that they have spent company money to best effect.

Lecturers, on the other hand, are acutely aware that to achieve attitude or behaviour change in days is an inordinately difficult task, especially when presented with a class of officers of differing rank, experience, and nationality. Unfortunately, the trap into which lecturers fall is to equate value for money with value added. Rather than adopting a teaching strategy that focuses on how students learn, they adopt a strategy that focuses on what the teacher teaches. The result is that the expert lecturer transmits as much of his or her expertise as possible in time given (value for money) rather than changing the attitude or behaviour of their class (value added). On this, the researchers and experts suggest that a course should contain no more that eight learning outcomes arguing that if there are more than ten learning outcomes, these are likely to be too detailed and thus will make evaluation unmanageable. An appropriate and precise blend of ‘cognitive’ and ‘phenomenography’ would be a wonderful scenario in future maritime education and training systems, with an outcome of the right type of marine engineers, deck officers, ratings and maritime shore professionals.

Until recently, providing solutions to the problems of developing non-technical skills and optimal use of crew resources has been considerably neglected in maritime training. Simulator-Based Training courses were introduced primarily to train the skills of passage planning and importance of the Master/Pilot relationship. This training initiative developed into the Bridge Team Management (BTM) course that is conducted today on simulators worldwide and STET Maritime Pte Ltd, Singapore is one of the leading training centres in the Asia-Pacific region. The BTM courses that are conducted nowadays contain some of the elements to be found in Crew Resource Management (CRM) courses developed in other industries such as aviation. These aviation courses were developed to focus on the non-technical skills of flight operations and include group dynamics, leadership, interpersonal communication and decision making. BRM courses are a more recent initiative, adapted directly from the aviation model for training the non-technical skills of resource management and are not always based on the use of simulators.

The introduction of Engine Room Simulators in 1980s onwards and, further, the introduction of cargo operations simulators came along to provide a total ship simulation environment in the current maritime training arena.

The Resource Management training is established in the main curriculum of many maritime training centres covering both deck and engine room disciplines.

It is realised from the history that this development of major training initiatives has resulted from the lessons learnt from a succession of casualties.

A recent review of maritime safety records reveals that the human error continues to be the major factor in maritime accidents and as high as 70% of recorded incidents are attributed to human error; failures in non-technical skills such as situation assessment and awareness predominate. In fact the majority of accidents were caused by the failure of the crew to respond appropriately to the situation. This strengthens the belief that for the safe and efficient operations of the vessels and marine facilities, there is a need to understand the behaviours of effective error detection and its management. However, unlike other safety critical industries, the maritime industry continues to lag behind in training and assessing resource management skills as a way to ensure that the errors and negligence are effectively detected and managed. So far, the only mandatory requirements in the maritime safety regime are in the IMO Seafarers’ STCW Code, which specifies the minimum standard of competence in crisis management and human behaviour skills for those
senior officers who have responsibility for the safety of passengers in emergencies. The understanding of non-technical skills and their assessment in the maritime domain are still ‘im mature’ compared to safety critical activities as in civil aviation and defence.

**Academic Foundation vs. Professional Competency**

The basics of learning are being redefined and fine tuned in the maritime industry through the various ‘think tanks’ of maritime education and training institutes and research centres. The researchers and academicians are seriously addressing this critical issue of ‘basics of learning’ to ensure that the future maritime students are prepared to handle future ships with complex operating conditions, regulatory and technological changes.

The academic foundation of the maritime students of future ships also has to be addressed in a critical way. The students learn and learn the type of attitudes, behaviours and cognitions that have deep significance for their understanding of the theory and hands-on stints for their effectiveness, on campus and onboard ships. The focus of the course curriculum lecturers needs to be more on effective engagement of students rather than designing their learning sessions. The class room approach should be refined in such a way that students learn more than the lecturers do through observation of, reflection on, and critical analysis of their own behaviour.

At the various maritime universities and training centres, courses and techniques are being developed that go beyond the STCW 2010 and further. The modules like Cross Cultural Management (CCM), Maritime Resource Management (MRM) and Crew Resource Management (CRM) are entirely concerned with teaching human behavioural or non-technical aspects of vessels and marine facility operations. The technical aspects of vessel operations like navigation, propulsion engines, machinery, power-generation plant and communication equipment are not covered as separate entities. In fact, the curriculum is blended more towards social and cognitive aspects of seafarers’ performance. It is devoted to those skills thought to be important in assisting in the detection and management of errors. A further new approach in this refined curriculum is the incorporation of human behaviour research findings in the training philosophy. The recognition oriented decision making theory suggests that there is a generic ‘metacognitive skill’ where the learners are geared-up with automatic awareness of their own knowledge and their ability to understand, control, and manipulate their own cognitive processes. The metacognitive skills are important not only in academic school or training centres, but throughout life. The metacognitive skill can be applied to handle any unpredictable scenario or situation. This theory can be put in practice by enrichment of ‘mental models’ through the building of ‘repertoire’ (building of the entire range of aptitudes, skills or devices used in maritime crisis scenario) patterns and also by development of critical thinking skills through the practice of specific techniques in ‘simulated’ scenarios.

The introduction of management courses like CCM, MRM and CRM are very much student centred, thus represent a module that seeks to add value to the learners through attitude, behaviour, and cognitive transformation. However, new ways of thinking, new techniques and new way of behaving need to be presented which can facilitate their abilities to handle crisis scenarios rather than lecturers merely providing feedback on how to ‘behave’ in crisis scenario. This approach would generate and enhance the safety behaviour pattern associated with effective error detection and management. The researchers have discovered that the new ways of thinking and behaving are the antecedents to ‘safe behaviour’. The antecedents like class room lectures, safety rules, procedures, toolbox meetings and risk assessments have proven to be ineffective in bringing about change on their own. It is the learner’s engrossed involvement through the above discussed techniques which shows the effectiveness of antecedents like safety rules, risk assessments etc. Thus the training courses that concentrate on antecedents where the emphasis is on what teachers teach and not how the students learn, are unlikely to bring about behaviour change. It can be well concluded that both antecedents and consequences influence the human behaviour, but differently; i.e. consequences influence behaviour powerfully and directly, while, the antecedents influence behaviour indirectly and serve to predict consequences.

It is to be well noted here, that the emphasis on the core technical subjects of maritime studies and the competency of the engineering and navigation students should not be compromised at any stage in their education and training curriculum. The fine blending with above discussed techniques and management skills will be the ‘essence’ of future maritime studies curriculum.

**Conclusion**

Education and training of seafarers and maritime professionals, still a very complex issue when compared to other disciplines, requires various considerations to be taken into account for a well balanced programme. The hands-on training ashore and onboard integrated with simulators cannot be thought about alone for skill enhancement when compared to human performance enhancement in extreme environments such as aviation. Although simulators and sea training onboard a ship play a key role for performance-oriented education and training, a well developed programme must include theoretical and practical aspects in a well-balanced curriculum and must ensure there are well-designed courses, leading to higher qualifications and certifications for career progression as well as for job diversification. There is, therefore, a need for clear pathways leading to attractive and successful careers, based on degree and higher qualifications in the related maritime subjects.

A continuous research work on maritime education and training is quite important and a ‘call of the time’ in order to address the challenging future scenarios for the sake of safety of all the involved stakeholders and prepare the future generation of reliable marine engineers, deck officers, ratings onboard ships, afloat marine facilities (FSO, FPSO, FLNG etc.) and of maritime professionals ashore.
Lifting the Veil on eNavigation

Descriptions of the obstacles that are slowing its implementation reveal what eNavigation will do

The International Maritime Organization (IMO) defined the goals of eNavigation in rather lofty and general terms. It, for instance, determined that eNavigation should:

- Facilitate communications including data exchange between ships, between ships and shore-based entities and between shore-based entities
- Integrate and present information on board and ashore to manage the workload of the users while also motivating and engaging the user and supporting decision making

A multinational group of experts (“the Correspondence Group” or CG) was formed under the auspices of the IMO’s Maritime Safety Committee (MSC) and Safety of Navigation Subcommittee (NAV). The CG was tasked to assess what obstacles stand in the way of achieving the eNavigation goals. You can’t really identify such obstacles unless you have a fairly good idea of the information exchanges that eNavigation will encompass. So the CG first identified these information exchanges and then looked for ways to streamline their processes and procedures.

This is not rocket science. Business process streamlining has been practiced by just about every company and government agency because it typically pays huge dividends. In many cases companies had to change the way they do things just to survive. This doesn’t mean it is easy. Dreaming up a better way to do things is easy. The hard part is to turn these “ideal world” dreams into tools that work reliably in the messy real world and to get people to use the new tools the way they were intended to be used.

That is exactly what the CG ran into. In its report to the NAV committee it presented a 47 page spreadsheet of the obstacles it identified that prevent streamlining of processes and procedures along with suggestions on how to bridge these “Gaps” as they call them.

The detailed description of these gaps reveal a great deal about the specific processes and procedures the CG wants to streamline.

eNavigation Information Services Menu

Fundamental to identifying the Gaps was identifying the information requirements of both mariners and shore-side users. The CG categorized information needs by the geographic areas of ship operations and the environment that exists within those areas. The CG identified five separate “Service Areas” along with an extensive menu (“Maritime Service Portfolio” or “MPS”) of information services needed for each one:

1. Harbor operations
2. Operations in coastal and confined or restricted waters
3. Trans ocean voyages
4. Offshore operations
5. Operations in Arctic, Antarctic and remote areas

Within a service area, menu items are broken down by information service users:

1. Mariners
2. Shore-based users

How will eNavigation change ECDIS?

As e-navigation is implemented, ECDIS is expected to evolve in many ways, with its final shape still a matter for supposition and conjecture. Many of the new eNavigation information services for mariners will be made available through new features. When selected, these features are intended to present the information in a meaningful, task oriented way designed to assist the mariner in making operational decisions. Some examples of the proposed new features are:

- **Automatic updating of Electronic Nautical Charts**
  The goal appears to be to use the voyage plan to automatically update the relevant ENC’s and electronic versions of publications (pilots, pilotage charts, tide tables, light list, etc.) in real-time. The gaps that the CG identified are 1) the lack of timely delivery of ENC’s and updates via the internet, 2) the unnecessary complexity introduced by encryption of electronic charts and 3) the lack of standards for transmission and display of non-ENC publications. While commercial solutions to overcome the ENC update problems are available, they are not available to all mariners. Also, electronic versions of publications are scarce.

- **Maneuvering Support**
  The goal appears to be to support the mariner in making maneuvering (and mooring) decisions by presenting real-time own-ship status information, environmental information (winds, currents) along with a highly accurate own ship position and heading relative to the dock. This might even include a prediction of what the ship’s position and heading will be in a couple of minutes.

Example of Maneuvering Screen courtesy of ADVETO
To receive winds and currents and to get a highly accurate position and heading relative to the dock it may well be necessary for the ship to exchange information with dock-side equipment, however, and this is another gap: standards for such information exchange are lacking.

- **Digital information exchange with the Pilot’s Portable Unit (PPU)**
  The CG identified as a gap that digital communication with the pilot could be improved. The AIS “Pilot Plug” was the first attempt to exchange digital information with pilots. It allowed a pilot to receive and display AIS information and own-ship information on the carry aboard laptop (PPU) but not all ships provided pilot plugs and those that did often positioned the plug in the wrong place on the bridge or had a plug that didn’t work at all. It appears that the CG proposes to fix these problems and to broaden the information exchange to more tightly couple the ship’s navigation system and the PPU. That could, for instance, include sharing VTS instructions, real-time environmental observations, waypoints, routes and maneuvering information.

- **Automatic, task oriented presentation of relevant Maritime Safety Information**
  The CG identified as a gap that relates to Maritime Safety Information (MSI). Actually, it is more of a gaping hole than just a gap: Upon receiving real-time MSI’s and other navigational warnings or broadcasts that are relevant for the vessel’s navigation, there is no interfacing technique that allows this information to be visible in real-time to the mariner. To fix this, the CG proposes:
  - That shore authorities transmit critical information to ship’s safety almost in real time and implement appropriate systems to enable them do so
  - To present appropriate MSI’s on a navigational display using standard symbols and text that consider the human element for effectiveness while preventing information overload
  - To automatically identify relevant MSI’s during route planning and voyage planning
  - That MSI’s have a parameter for urgency and that the ECDIS system provides the alarms

- **Real-time environmental observations**
  The CG identified as a gap that currents, water levels and weather information is not automatically received. The CG appears to feel that, if such real-time observations were automatically received and presented (on-demand), then the mariner could and would use them to make operational decisions. For example, transmission of real-time, tide-corrected bathymetry would allow the mariner to use ECDIS to automatically draw safety contours on the screen by taking into account the ship’s draft and the minimum under keel clearance.

- **Weather Routing**
  The CG focused on gaps in delivery and presentation of real-time observations but, surprisingly, did not focus on weather routing. Many ECDIS systems are not able to simulate alternative trans ocean voyage tracks to estimate their time of arrival and fuel consumption while taking into account own-ship loading characteristics, short-term gridded binary (GRIB) weather forecasts, seasonally adjusted climatological information and pilotage charts. If it were made available, weather routing would assist the mariner with selecting a safe track while minimizing fuel consumption.

- **Traffic Organization Service (TOS)**
  The CG identified as a gap that there are no standard data formats for on board capture and presentation that covers the entire scope of information provided by a VTS. The latter includes things like the VTS traffic flow plan and the time slot allocations to individual ships.

VTS authorities in some cases may not only prescribe traffic separation schemes and arrival and departure sequences but actually prescribe the track to be followed, the time to start on the track and the arrival time at waypoints (“Gates”) along the prescribed track. This is likely the case not only for busy harbor approaches but also in waterways such as the Bosporus, the Malacca Straits, the English Channel, Gibraltar, etc. ECDIS could be set up to automatically receive and display the prescribed track along with the speed to maintain to arrive at the check-in gates at the prescribed time. Doing so will greatly reduce voice VHF transmissions and thereby ambiguity caused by language comprehension obstacles.

The CG identified as a gap that current VTS hardware and software may not have the capacity for real time display of vessels’ track to provide a (NAS or) TOS service. eNavigation will change not only ECDIS but also shore-based VTS Systems. It will require, for instance, upgrades to enable these systems to automatically receive and accept Automatic Identification System (AIS) transmissions (vessel and voyage particulars and position updates). Upgrades will also be required to allow transmission of traffic flow plans, their associated tracks and time slot allocations to individual ships.

- **Navigation Assistance Service (NAS)**
  This service is normally rendered at the request of a vessel or by the VTS when deemed necessary. NAS is especially important in difficult navigational or meteorological circumstances or in case of defects or deficiencies such as lack of ENC coverage. When requested, the VTS operator assists the bridge team with determining the vessel’s position and provides advice to support on board navigational decision making.

The CG notes as a gaps that 1) the VTS operator should have confidence that the information is correctly exchanged with the ship and 2) that the system enables the operator to effectively communicate with
the bridge team. To be effective, NAS requires close coupling of the on board navigation system with the VTS system. AIS provides some of the required telemetry (GPS & heading sensor) but standards are lacking for the exchange of other information, such as digital transmission and acknowledgement of information, warnings, advice and instructions that the VTS Operator provides.

- **Remote Inspection of Navigation Equipment**
  Several of the gaps the CG identified refer to remote monitoring of the quality of on-board navigation systems by shore based authorities. It seems that the CG proposes to enable shore-based authorities to remotely determine things like:
  - The make and model of the ECDIS and radar systems that are being used, and whether they are running the latest version of the system software. This tells them, for instance, whether the on board ECDIS can automatically receive and display MSI’s.
  - The make and model of the GPS and eLoran receivers that are being used and whether they are running the latest version of their system software along with their position accuracy.
  - The version of the ENC being used for the coastal area and for the harbor approach and whether the on-board ECDIS system can automatically receive and install a new version.

  This type of fully automated remote inspection is likely to be more effective than the current practice of only relying on one-time type certification of navigation equipment that freezes its further development.

- **Remote Update of AIS Voyage Details**
  The CG identified as a gap the “lack of a single-window and/or automated and single entry for any required reporting information into the system for it to be shared by authorized authorities without further intervention by the ship during navigation”. From the proposed solution it becomes clear that the CG is referring primarily to AIS voyage details (message 5). The CG appears to favor enabling shore-based authorities to remotely update a ship’s AIS voyage details if they are out of date, which still occurs quite frequently. The CG also proposes that ship operators use satellite-based systems to monitor its ships’ AIS transmissions (AIS-S) and alert the bridge team if the voyage details are out of date.

How will eNavigation change the mariner’s administrative processes and procedures?

The CG identified a host of gaps that involve processes and procedures that are not associated with the safe navigation of the ship. These administrative processes and procedures currently, however, take up a lot of the mariner’s time. An example is associated with ships’ reporting obligations:

- **Standardized and automated reporting**
  The CG identified insufficient means for ship reporting as a gap. The CG proposes to “remove the need for human interface and communication of manually operated systems by replacing them with automated systems (based on shipboard AIS) that will seamlessly populate VTS and Marine Domain Awareness (MDA) systems, anywhere in the world”. This is an ambitious goal. It requires for instance that the European SafeSeaNet, the Baltic nations’ HELCOM, the US Electronic Notice Of Arrival/Departure (eNOA/D) and all similar national and port systems in the world will automatically receive and accept a single set of electronic reports about the vessel, the voyage, the cargo, the crew and the passengers.

  Please remember that the above list of proposed services was not provided by the CG. The author merely inferred them from the CG’s gap analysis. The list of proposed services is, also, not intended to be comprehensive. The CG identified many more gaps that are associated with Search And Rescue (SAR), with Ice Navigation along with a host of others gaps but the services described above represent the major ones that mariners would be able to use in the normal course of operations. Everyone that will be affected by eNavigation should read the report of the CG to the NAV committee (see http://e-nav.no/media.php?file=96).

  It is not too late to influence the design of eNavigation services that will be offered. The eNavigation Conference in Seattle (November 29 - 30, 2011) provides an excellent opportunity to provide feedback to not only the Chairman of the CG (Mr. John Erik Hagen, Norwegian Coastal Administration) but also to the USCG and US Federal Department of Transportation officials that in turn are in a position to influence implementation of the CG proposals at the IMO, IALA and ITU level.

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BES is a collaborative unit of the Company of Master Mariners of India (CMMI) and the Institute of Marine Engineers (India) (IMEI). BES was formed in 2005 and authorised by the Directorate general of Shipping to conduct ‘All India Exit Examination’ for trainees passing out of pre-sea training institutes for ratings.

The Institute of Marine Engineers (India) [IMEI], was established in 1980 and registered under Bombay Public Trust Act 1950 (Registration No.F-7589 of 31 May 1982. www.imare.in

The Company of Master Mariners of India [CMMI], is registered under the Companies Act, 1956 (Registration No. 10924 of 1957-58). www.mastermariners-india.com

Through IMEI and CMMI, BES is supported by a very large number of professionals and their associates in the Marine Industry. Dedicated involvement of trustees has made BES an organisation of repute. It has developed highly collaborative relationships with the training institutes and marine industry to provide proactive support.

**Aim of BES**

The Institute of Marine Engineers (India) (IMEI), was established in 1980 and registered under Bombay Public Trust Act 1950 (Registration No.F-7589 of 31 May 1982. www.imare.in

BES registered as charitable trust under the Assistant Charity Commissioner Thane and is certified ISO 9000-2008 organisation under the Indian Register of Shipping.

At present BES is involved in following activities:

1. All India Exit Examination for ratings – General Purpose Ratings and Catering Ratings
2. Development of text Books and instructional CDs for General Purpose Ratings (GP) and for Certificate Course in Maritime Catering (CCMC). Continuous revision
3. Evaluation of answer scripts for IGNOU BS Nautical Examination
4. Study into training of ratings
5. Improvements in the quality of training of ratings in India
6. Advising Directorate General of Shipping on matters pertaining to training and employment of ratings.
8. Common Entrance Test for GP Rating Pre-Sea Training
9. Online Test for GP & CCMC Course Ratings
10. Structured Shipboard Training Program for NCV Deck Cadets
11. Providing expert resources and guidance to Rating Agency for Grading and Benchmarking of training institutes.

Other projects in the making are listed below:

1. Common Entrance Test for entrants to training for ratings
2. Online test for other short courses
3. Posters to assist training
4. Documentation Facilitation Service for COC examinations for MMD/DGS.

**Core Values of BES**

- Excellence
- Honesty and Integrity
- Innovation
- Teamwork

**Quality Policy**

Strive to achieve a High Quality Standard in carrying out Assessment, Examination or Consultancy for Personnel entering into or engaged in the Maritime Industry as Seafarers through an effective Quality Management System which complies with the requirements of ISO 9001:2008.

**BES is committed to:**

- Understanding and maintaining a balance between the needs and expectations of customers and other interested parties
- Communicating policy and objectives at all levels in BES
- Involving personnel in development and providing a work environment aimed at motivating continual improvement of effectiveness and efficiency of services, processes and management system.
- Adopting and promoting process and system approach
- Basing decisions on analysis of data and information collected from monitoring and measurement of services, processes and system characteristics
Developing and maintaining alliances with suppliers to jointly improve performance.

Objects of the Trust

The Principal objects of the Trust are:

1. To carry out assessment, selection, examination and certification and consultancy or such similar tasks for personnel entering into or engaged in Shipping and Transport Industry as Seafarers and to ensure the quality, integrity and transparency in such activity;
2. To carry out inspections, assessment, grading and certification of maritime training institutes.
3. To publish educational materials, lessons, plans and other instruction to facilitate assessment, providing guidance to similar project to ensure quality of assessment and examination;
4. To implement schemes, plans and programs for fulfilling the objects of the Trust and to present action plans to the Trust and when required
5. To do other acts and things as are conducive or helpful to the advancement and fulfillment of Trust’s requirements and other objects mentioned hereinabove.

Present Trustees

IMEI Members
Mr. M.V. Ramamurthy/Dr. B.K. Saxena
Mr. A.K. Ghosh

CMMI Members
Capt. V.K. Gupta
Capt. John P. Menezes
Capt. Mohan Naik
Capt. R. Chandramowleeswaran

Trustees in the recent past
Mr. K. Chidambaram
Mr. R.C. Bhavnani
Mr. P.S. Murthy
Mr. Ravi Bhatia
Mr. R.L. Jain

Founder Members
Mr. K. A. Simon
Mr. P. Mitter
Mr. P. P. Chugani
Mr. GSK Mohan Rao

Supporting Members
Several Master Mariners and Chief Engineers all over India.

400,000 Pinoy Seamen by end of 2011

Rising number due to the skills and competence of the Filipino seafarers

The number of Filipino sailors working in the world’s merchant fleet is expected to hit 400,000 before the end of 2011.

Carlos Cao, Philippine Overseas Administration Office (POEA) administrator, attributed the rising number to the seamanship skills and competence of the Filipino seafarers.

“We are targeting to reach a 400,000-mark deployment of our seafarers overseas this year, and it is indeed, very encouraging, indications have surfaced that we may even surpass this target,” he added.

“In 2010, our deployment data for sea-based sector was 347,000 which was a 5.06-percent growth over the 2009 data, with an increase for land-based of 3.2 percent, showing a combined total of 1,470,826 deployment for that same year (2010), as compared to 1,422,586 in 2009, and 1,236,013 in 2008,” Cao emphasized.

The POEA chief also said seafarer remittance for January to July 2011 has already reached the USD11.4 billion or a 6.3-percent increase over the same January to July 2010 figure of USD10.679 billion.

Source: PhilSTAR 03 Oct 11

Who in the world am I? Ah, that’s the great puzzle.
New Zealand’s Oil Disaster: Black Swans and Human Errors

Between 40 and 1400 tonnes of fuel oil were leaked into the ocean

A couple of years ago, the writer Nassim Nicholas Taleb invented a new metaphor which describes what he calls low probability, high impact events – the Black Swan. For centuries this creature was not thought to exist, but then the discovery of a single animal turned this assumption on its head. What Taleb is getting at is the way in which our ideas about the way the world works can be totally shifted by a single, shocking event. Once it happens, the author notes, humans are pretty good at concocting explanations for why it did, to make the thing seem more normal, to allow us to continue on as before.

The sinking of the ‘unsinkable’ Titanic: a classic black swan. The BP oil disaster in the Gulf of Mexico, another. Exxon Valdez? Sure. This week’s grounding of a tanker carrying fuel oil through one of the most beautiful marine environments on earth? Just the latest.

As the 21st century evolves around us, one thing is clear. When it comes to mankind’s thirst for energy we are entering uncharted waters, and the old assumptions are no longer cutting it. Major spills don’t happen in rich countries with tough regulations, like the U.S., like Britain, like New Zealand. Wrong. Oil companies are getting better at avoiding major spills and at dealing with them when the worst happens. Wrong. Existing regulations are enough to prevent this kind of thing happening in the future. Wrong.

What we’re really seeing is an industry that is becoming increasingly desperate as the easy oil runs out and the good times come to an end. Wells are deeper than ever before. More contractors are involved in rigs, the all looking to shave precious dollars from their costs. Down the supply chain, shipping companies are operating under more pressure, more stress, more anxiety.

And so we come to a coral reef near the crystalline beaches of Mount Maunganui in New Zealand, where right now anywhere between 40 and 1400 tonnes of fuel oil is leaking into the ocean, too late for anything meaningful to be done. Ignore people who say that spill response technology is better than ever – no more than 10 percent of any spill will ever be removed. The best we can hope for is that the waves will chop up the surface of the chemicals and allow for faster absorption into the sea.

And for what? This oil was destined to lubricate cars, SUVs, motor yachts. Now it’s lubricating the windpipes of sea birds, dolphins and whales. Rather than use an event like this one - or any of the other oil disasters that humanity has inflicted on the earth recently - to stop and think, we concoct explanations for why it happened. It’s a unique case. It can never happen again. This was a one-off, an outlier.

The same governments that express their shock when events like this happen are the same who refuse to consider them as signals to change course. The industry will act humble for a month or two, accept some responsibility, put human sounding statements on websites. Politicians will express their outrage and determination to ensure this never happens again. Then, before the crocodile tears have dried, they’ll be bowing to oil industry lobbyists, terrified of big oil’s power over their political futures.

There must be a better way. As hundreds gather in major cities around the U.S. to protest the way corporate greed has contaminated our political system, we must use this momentum to change things for good. Our governments are there to protect us from catastrophic events, not to explain them away with vague statements and warm condolences before putting greed above science again, and again. We must have faith in humanity to see the looming environmental crisis we’re headed for, and do something about it.

It’s time to tell those in power that we, the people, see which way the wind is blowing. And like the black swan on the eve of winter, it’s time to change course.

Source: Huffington Post 26 Oct 11
On November 1, 2011, FURUNO INS Training Center Singapore (FURUNO INSTC Singapore) opens the doors for deck officers in need of FURUNO’s type specific ECDIS training. Thanks to the strong support from Rico (PTE) LTD, a FURUNO subsidiary in Singapore, the training center is established in the premises of the same company.

With this step, FURUNO has made its type specific ECDIS training available in one of the major Asian shipping hubs, hence making it easier for deck officers signing on or off a vessel to go to the training center and receive the 2-day type specific ECDIS training course.

“Type specific ECDIS training has two goals. One is to provide the safe operation of the equipment by giving the operator proper and thorough knowledge on the user interface and operation of FURUNO ECDIS. The other is to allow the operator to learn about all the functionalities and values provided by ECDIS, and how to utilize them in the daily work and ship operation. This allows the navigator to conduct his navigation tasks more efficiently. It generates a better return on the ship owner’s investment in ECDIS equipment and training.”

In parallel with the establishment of FURUNO INSTC Singapore, FURUNO is working to expand the cooperation with other training centers around the world in order to contribute to safer navigation.

Source: Maritime Executive 19 Oct 11
Durban Female Pilots

History was made in the port of Durban on 29 August when the 9000 teu container ship MSC Chicago became the largest vessel to sail into South African waters. The ship was guided into port by Pinky Zungu, one of three women marine pilots who recently made history when they became the first black females in South Africa to obtain open licences, which enable them to help guide ships of any size and type into South African ports.

Precious Dube and Pinky Zungu about to board a helicopter. The third pilot is Bongiwe Mbaibo.

Crew Training Includes Familiarisation with the Operation and Maintenance of Bilge Water Equipment

The United States Coast Guard (USCG) has reported a number of occurrences where ships’ crew not have been able to retrieve, review and record data from 15ppm bilge alarms approved in accordance with IMO Resolution MEPC.107(49).

Resolution MEPC.107(49) requires that all routine and repair maintenance on the 15ppm bilge separator and alarm are recorded and that ship staff training should include familiarisation with the operation and maintenance of the equipment.

IMO Circular MEPC.1/ Circ 677 requires that all oily water separator (OWS) operations including diagnostics should be logged in the Oil Record Book (ORB).

Source: USCG 12 Oct 11 - 10:15
GPS Doomsday? Not Yet But...

From a New Scientist article – Maritime Accident Casebook March 2011

That is how New Scientist described the results of a GPS jammer during tests off the UK coast. Although illegal in many jurisdictions, the devices are available online for as little as $30. While these results are dramatic, as a report from the Royal Academy of Engineering published this week shows, some GPS vulnerabilities may be more subtle and growing dependence on GPS needs to be moderated by greater awareness of threats to the system’s integrity.

The academy’s study has identified an increasing number of applications where position-navigation-timing, PNT, signals from global navigation satellite systems, GNSS, are used with little, or no, non-GNSS based back-ups available. The trend is for GNSS to be used in a growing number of safety of life critical systems. Unfortunately, the integrity of GNSS is insufficient for these applications without augmentation. Non-GNSS based back-ups are often absent, inadequately exercised or inadequately maintained. The original implementation of GNSS, the US operated GPS comprises ground based, space based and receiver segments, all of which are susceptible to failures of various types. There are also some common mode failure mechanisms which can affect whole classes of receiver or even the entire satellite constellation. A failure, or loss of signal due to some outside influence, can result in a range of consequences depending on the application; in a telecommunications network, a small loss in the efficiency of data handling may occur while the system ‘freewheels’ until a signal is restored: in a surveying application where timing is not critical, some delays may occur before the survey can be properly completed. In such applications, a temporary loss of GNSS signals might be considered an inconvenience. However, where systems are used in safety of life critical applications, the consequences can be more severe – in some situations, even if operators are well versed in procedures for a loss of GNSS signals, the number of interlinked systems simultaneously activating alarms can lead to eroded situational awareness of operators in what could well be an emergency situation.

GNSS have system-level vulnerabilities: GPS satellites have on rare occasion broadcast dangerously incorrect signals, a reduced number of satellites visible could prevent availability of a position fix, and GNSS receivers can incorrectly process valid signals to give unpredictable results. GNSS signals are very weak: typically less than 100 watts transmitted from a distance of 20,000 km to 25,000 km. When received at the surface of the earth, the signal strength may be as low as –160 dBW (1 x 10–16 ) watts, with a spectrum spread out effectively below the noise floor in the receivers. Deliberate or unintentional interference with this signal can easily defeat the signal recovery or overload the receiver circuitry.

Furthermore, signals are vulnerable to disruptions in the atmospheric medium they pass through, and receivers can also unintentionally lock onto reflections of the signals, known as multipath, giving unexpectedly large errors. These causes can have quite different effects on users, such as partial or complete loss of the positioning and timing service, poorer accuracy, very large jumps in position, velocity or time, and ‘hazardously misleading information’ (HMI) that is to say, believable data that is dangerously wrong in safety critical applications.

‘A state-of-the-art bridge for state-of-the-art navigation’.
Internet and Modern Technology Changes the Way Shipping Industry Works

‘Internet Use in Shipping’ survey

eCommerce concern ShipServ has released the findings of its 2011 ‘Internet Use in Shipping’ survey.

The results of this year’s survey, released at the SmartShipping conference in Singapore this week, show a quickening of observable trends in internet use, with many respondents adopting new tools and working methods to adapt to challenging shipping market conditions.

The survey’s key findings were:

- Many more marine buyers and suppliers are using internet to source and transact, with a 15% increase in usage between 2010 and 2011.
- Users consider peer reviews on suppliers and the selection of trusted websites as the two most important factors in influencing a purchasing decision from an internet provider.
- Respondents said faster transaction speed was greatest benefit of doing business over internet.
- The use of social media applications is here to stay. In the biggest shift since 2010, the survey found that 75% of respondents said they would increase their use of social media in a business context.
- Over 50% of respondents said they use the mobile internet or a mobile application every day.

Mark Warner, ShipServ business development director, who presented the results in Singapore, said: “This survey is unique in the shipping industry and it highlights not just the increasing usage of the internet but also the tangible benefits it brings to end-users.

“While we expected to see the uptake of ecommerce grow, there were some welcome new developments. For example, there has been a fundamental shift in attitudes over the last 12 months, as shipping industry users adopt the tools and methods of social media - such as mobile apps, reviews and ratings - into their daily business practices online,” he said.

The survey collected opinions both online and offline from purchasing managers and suppliers from leading shipowners, managers and suppliers during and after the IMPA 2011 exhibition and conference.

In other key findings, the survey noted that internet search plays an increasing role in buying decisions. Around 50% of purchasers begin the majority of their buying processes on the internet by using sourcing tools such as Google or ShipServ Pages.

One of the biggest obstacles to adoption of ecommerce remains a lack of trust, but it is noticeable that the issue of lack of understanding has decreased substantially since 2010.

“We have seen a very noticeable shift in attitude in the understanding of the benefits associated with ecommerce,” added Warner. “People are no longer asking why they should use it but asking how they can use it to gain the biggest advantage. This is a seismic change.”

The company carries out an annual survey into the use of the internet and ecommerce in the shipping industry with the aim of building an understanding of how trends in business-to-business ecommerce are impacting the maritime sector.

Source: Tanker Operator 31 Oct 11
Passage Planning in Confined Waters and Traffic Separation Schemes

Safety alert issued by West of England P&I Club

The West of England P&I Club issues Safety Alert regarding Passage planning in confined waters and traffic separation schemes as follows:

The Club has recently encountered a number of large claims where vessels have had to alter course during a close quarters situation, resulting in either a collision or a grounding.

These incidents have taken place while navigating in high traffic areas where many vessels have been using very similar passage plans. When passage planning it is customary for the course to be laid off on paper charts or entered into the Electronic Chart Display and Information System (ECDIS), ensuring that the voyage will be the shortest and safest route possible between the port of departure and the port of destination.

Any applicable mandatory navigational requirements will also need to be incorporated.

Navigators should be aware that in busy waters off headlands, shoal patches and within Traffic Separation Schemes, many vessels may be following similar tracks and altering course at waypoints plotted in very close proximity to one another.

To view further information, please go to http://www.westpandi.com/Documents

Source: The West of England P&I Club 09 Sep 11

The World’s Oceans are in Trouble

One World One Ocean Campaign Highlights Need For Conservation

A new multi-year, multi-platform campaign hopes to raise awareness about the state of the world’s oceans and focus on how they can be protected. The One World One Ocean campaign is an extended film, television and online campaign led by filmmaker Greg MacGillivray.

The campaign’s principal science advisor, Dr. Sylvia Earle, said in a press release, “The world’s oceans are in trouble, but the good news is there is still time to save them. Our actions toward the ocean in the next 10 years will define the next 10,000.”

Earle, who was nominated as one of 2011’s Green Game Changers by HuffPost, has stressed the importance of healthy oceans in the past.

She wrote last year, “few people seem aware of the vital role the ocean has in maintaining a planet that works in our favor.”

A report this summer from the International Programme on the State of the Ocean found that a mass extinction “unlike anything human history has ever seen” is imminent if “current actions contributing to a multifaceted degradation of the world’s oceans aren’t curbed.”

In July, the National Atmospheric and Oceanic Administration released its annual overfishing report. 16 percent of U.S. fish populations are overfished, and the number has been growing in recent years.

Fish in other countries may also be facing an uncertain future. A study by the International Union for Conservation of Nature earlier this year found that “more than 40 fish species in the Mediterranean could vanish in the next few years.”

Governments could be contributing to the precarious place of the world’s sea life populations. An Oceana report found that multi-billion dollar subsidies from the European Union “promote a European fishing fleet that is up to three times bigger than sustainable limits.”

Although the number of deaths has been reduced by 90 percent since 1990, a recent study found that 4,600 sea turtles are killed annually in U.S. fisheries.

Source: Huffington Post 13 Oct 11
Roy Stall – New Individual Member of GlobalMET

Roy’s maritime experience began at the age of 16, when he joined the Royal Australian Navy. He studied seamanship, navigation, ‘naval indoctrination’, and academic subjects, before being trained as an Electrical Mechanic (Electronics). On his first posting, to a River-class frigate, he recalls one of his most daunting experiences was one day having to ‘parallel’ two generators located in a hot, rocking engine room at 0200 – at the ripe age of 17. (The captain, officers, crew and others were waiting patiently for him to add the second generator, because more amperage was needed for some heavy electrical machinery.)

He was later recommended for officer training and subsequently served in various ships including an aircraft carrier, a destroyer, and an anti-submarine frigate.

After his navy service he studied Asian Studies at the Australian National University then worked for some decades in education administration, before turning his hand to teaching English as a Second Language. He was introduced to the world of Maritime English (ME) in the early 2000s and since then he has delivered intensive Maritime English programs at several Chinese maritime universities, as well as taken part in three voyages in a Japanese training ship. He has also done extensive editing of some online Maritime English programs for a European training company and is now working closely with OISE Bristol on a number of ME initiatives.

He is especially interested in delivering intensive programs to senior deck officers and engineers (1-2 weeks), and also delivering Train-The-Trainer programs.

Roy’s maritime and general nautical background, combined with his ESL teaching qualifications and experience have uniquely qualified him to specialize in Maritime English. He is based in Perth, Western Australia, and can be contacted on +61 419 042 468 and his email address is rstallau@yahoo.com.au

UK MAIB Issues Report for the Collision Between a Container Vessel and a Fishing Vessel

The UK Marine Accident Investigation Branch (MAIB) issued the report of its investigation into the collision between a container vessel and a fishing vessel south of the Isle of Man on 9 April 2011.

The collision was the result of improper assessments and maneuvers by the officer of the watch of the container vessel and inadequate watchkeeping by the mate on the fishing vessel.

The container vessel also did not comply with the requirement to render assistance following the collision. To view the report please go to:

http://www.safety4sea.com/admin/images/media/pdf/UK%20MAIB%20REPORT.pdf

Source: UK MAIB 14 Oct 11
Time for Action on Fatigue

… it is time we actually did something concrete about the haste with which we expect ships to operate, or at least man them accordingly so that utter exhaustion is not an accompaniment to the normal job. Perhaps, if we are to attract and retain the bright young officers we hope will enter the industry, and prevent those we have describing the job as ‘a misery,’ we ought to stop talking and putting off the day when ships are going to be manned adequately for the intensity of their trade, and not buy some ridiculous minima cobbled together between the owner and flag state.

Michael Grey writing in The Sea Sep/Oct 2011