



The International Maritime Human Element Bulletin

Issue No. 11 April 2006

ISSN 1747-5015



The primary aim of the **Alert!** project has been to improve the awareness of the Human Element in the maritime industry through the publication of these Bulletins, backed up by the website and its database of academic and technical papers, presentations and letters to the editor.

Feedback from our readers has always been positive, describing the articles in the Bulletins as 'interesting', 'informative' and even 'entertaining', and it is clear that we have successfully created a body of knowledge regarding the Human Element in shipping. However, it is also clear from this feedback, that there is a need to focus on the application of this body of knowledge to address a number of key Human Element issues.

This edition of **Alert!** is loosely titled: *How to do it*. It covers a range of issues including crew competence, training, leadership and management, ship and system design, and the application of Human Factors methodologies. The focus, however, is on integrating the Human Element – a process that does not just start at the design stage of a ship and finish at build but one which must be applied throughout its lifecycle.

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 Human Element jigsaw

Integrating the Human Element into a complex system such as a ship is a bit like putting together a jigsaw puzzle. There are many component parts, some of which are readily identifiable and easy to link together such that the semblance of a picture soon begins to form. There are, however, others that are not so obvious, and it takes a certain amount of 'trial and error' to fit them into the right slots until, eventually, the whole picture is complete.

A ship comprises of a number of component parts (systems) each of which will have some effect on the overall performance of that ship. The extent to which a system will have such effect will depend on how critical it is to the safety of the ship and to its crew. Some systems may be fully automated, but they will still require a degree of intervention from the seafarer, whether it is to set the initial tolerances or to respond to alarms. Some may require direct seafarer input for their operation and for their maintenance. Others will require humans to interact with other humans, and some may be driven by 'outside influences' such as the environment, other humans, or technology. Furthermore, the shipboard environment requires seafarers from a variety of cultural backgrounds to work, socialise and

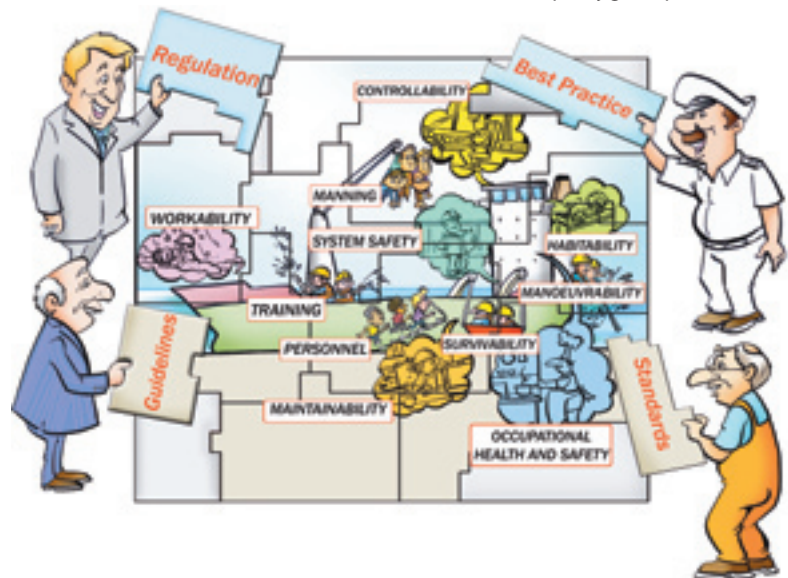
live harmoniously with one another.

The process of integrating the Human Element into this complex system starts at conception, but it does not stop there. It is a dynamic process, which must be kept under review throughout the lifecycle of the ship to take account of, for example, changes in its operating pattern, system updates, improved technology and new regulation.

Any of these can have an effect on the key domains of human factors engineering and human resources. Human factors engineering takes into account the interests and needs of the crew, especially in respect of the six 'abilities' (habitability, maintainability, workability, controllability, manoeuvrability, survivability), occupational health and safety and system safety. And, the human resources process considers the mix, number and competency requirements for the crew.

Ultimately, the aim is to achieve a balanced development of both the technological and human aspects of the ship's operational capability, in order to ensure the safe conduct of the ship, the safe and timely delivery of its cargo; and, a safe, happy and healthy working and living environment for the crew.

Integrating the Human Element is indeed a complex jigsaw puzzle...



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Alert!

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Published by the Nautical Institute, the world's leading international professional body for qualified mariners

www.nautinst.org

Membership info: sec@nautinst.org

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Design & artwork production by:
Jacamar (UK) Ltd +44 (0)23 92410108

Printing by: Indigo Press +44 (0)23 8023 1196

Web site by: Informatic +44 (0)1243 555 108

Cartoons by: NewsLink Services
(India Office) +91-9811649064



Crew continuity and competence

Tony Baker,
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North of England P&I Association Limited

Recruiting and employing competent seafarers is essential for the safe operation of today's ships. Unfortunately too many significant insurance claims now have their roots in lack of basic skills. Human error is a notoriously difficult area to come to grips with, but crew competence is an issue that must be addressed.

Seafarers with a good knowledge of a company and its ships, who identify with both and display care and loyalty are less likely to produce claims. Ship owners and operators can achieve a high level of crew continuity and competence by providing seafarers with secure employment and taking human factors into account – including recruitment, health, training and general awareness of shipboard best practice – and by investing in high quality risk-management systems.

The key to best practice is to base risk assessment on good quality information and to introduce control measures that

either prevent or reduce loss. Key areas in training could, for example, include bridge team management, which addresses communications between seafarers of different nationalities and ensures proper application of the collision regulations.

P&I clubs can provide both information and systems to help ship owners with their risk-management programmes. An example would be the pre-employment medical programmes offered by some clubs, including North of England, that aim to ensure that only suitably healthy seafarers are employed.

Interpretation of regulations on minimum manning can also cause problems. The intention of the regulations is to provide for a safe minimum number of competent persons on board a ship. But, if the minimum number becomes the norm, the stress of navigating in heavily trafficked waters and the ever-growing reporting burden may now be asking too much of today's seafarers.



Training Needs Analysis – What, How, Why...

Mark Brunt,
Training and Human Factors Consultant
CCD Design & Ergonomics Ltd

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.



Leadership and managerial skills for shipmasters

Capt I G Sangameswar, MNI,
Assistant Director (Training Standards), Maritime and Port Authority of Singapore

The shipmaster is entrusted with the overriding authority and responsibility for the safety and security of the ship. Poor decisions made by a shipmaster could result in damage to the ship and its cargo, pollution of the marine environment, and/or loss of lives. Such incidents could, in addition to legal sanctions, tarnish the reputation and impact the overall business of the company. It is therefore important for a shipmaster to be not only technically competent but also to possess the leadership and managerial abilities to effectively lead his crew and run the ship.

To this end, the Maritime and Port Authority of Singapore (MPA) has introduced the *Command Assessment Programme (CAP)*, a voluntary programme, which can be used by shipping companies to assess some of the leadership competencies, such as decision-making, team management, culture-building and emotional stability – all of which are important for effective performance as a shipmaster. It is used by companies to groom chief mates to

take over command and to build the confidence of newly promoted masters.

The CAP is conducted, over a period of 3 days, by a team of qualified and experienced master-mariner trainers and occupational psychologists. It comprises of:

- **Psychological Assessment**

Psychometric questionnaires, interviews and observations are used to gather information on personality, leadership style, stress coping ability and psychological qualities of the participant.

- **Simulation-based Assessment**

A full-mission shiphandling simulator at the Integrated Simulator Centre of Singapore is used to conduct assessment exercises. Participants are required to take command of the ship in handling a variety of challenging situations and emergencies.

- **Written/oral presentation**

Participants are required to study information about the issues/problems in a particular case scenario onboard a ship. They are then required to evaluate the information, provide judgement on

the situation and recommend actions on how to handle that situation in a multi-cultural environment.

- **Peer Group Exercise**

Participants are presented with challenging tasks and required to work together as a group to accomplish a given objective within the time limit set. The design of the programme allows the participants to be brought into an 'out-of-the-box' environment to measure/reconfirm many elicited behavioural patterns in various environments.

On completion of the CAP the psychologist will provide an assessment of the key strengths and weaknesses of each individual and identify areas for development. To date 102 participants have completed the programme, and the feedback from participants and their companies has been encouraging.

The views expressed in this article are those of the author and are not necessarily those of the Maritime and Port Authority of Singapore.

For further information on the CAP go to: www.stet.com.sg/maritime/cap.htm

Comfort design of ship accommodation a harmonization of theoretical analyses and experiences!

Dr Osamu Niho, Deputy General Manager, Mitsui Engineering & Shipbuilding Co Ltd

It is a final goal for a ship designer to deliver the vessel with which the owner is fully satisfied. For his satisfaction, what are the most critical requirements for commercial vessels such as oil tankers, bulkers, container ships, gas carriers and so on? Maximum cargo carrying capacity, high service speed, economical fuel oil consumption, robust structure, easy maintenance...In addition to these, comfort in accommodation - noise and vibration, for example - is one of his important concerns, considering crews' habitability and working conditions. Referring to design criteria, capacity, speed, strength etc. are all scientific and objective. Meanwhile, criteria on noise and vibration have a very subjective nature, which involves many human elements. In case of objective criteria, theoretical analysis is most helpful. For the issue which involves human elements, analysis alone may not be adequate to satisfy the criteria and actual experiences play an important role as well.

At the negotiation stage of a recent new building contract, noise and vibration levels in accommodation are inevitable discussion items. Such design criteria are often provided for in the Contract Specifications as rules and regulations; IMO resolutions for noise and ISO guidelines for vibration in accommodation. However, neither code nor guideline could solve the issues. The designer starts the work with initial arrangement of accommodation layout based on his idea and sense cultivated through his experiences.

As for noise, cabin and machinery arrangements are most dominant. As for vibration, the designer should consider not only excitation forces but also structural response. At the early design stage, the number of propeller blades is selected considering the frequency of excitation force in conjunction with main engine revolution. The first design target is to avoid resonance, and the second to reduce response levels. The designer pays much attention to main structural member arrangements, such

as continuing walls from engine casing through accommodation house and full underneath support of side, front and aft walls of house under upper deck.

Today's advanced technology such as hydrodynamic codes and Finite-Element Method (FEM) analysis could predict propeller-induced excitation forces such as surface forces and bearing forces, and structural resonant frequency fairly well. It may be, however, beyond reality to say that very accurate predictions of vibration response levels in accelerations or velocities are feasible. Some designers might have experienced the discrepancies between predictions and actual results. Success in comfort design depends mostly on initial careful considerations and arrangements. Design is not an analysis but a synthesis endorsed by many experiences.

It goes without saying that a technical harmonization of advanced analyses and experiences is the most essential key to solve the issues relating to human factors.

Integrating the human element **A rough guide**

Personnel

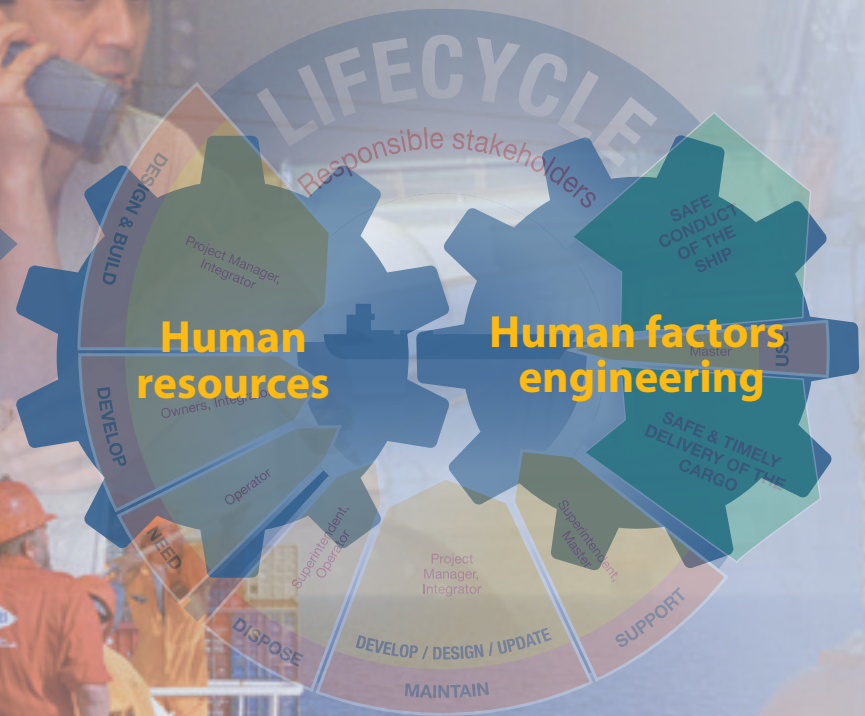
Correct mix of people onboard to operate and maintain the ship and its systems

Manning

Number of people required for the safe operation and security of the ship and for the protection of the marine environment in both normal & emergency situations

Training

Competency and familiarity with the ship and its systems



Human resources considerations

Manning:

- Tasks, duties & responsibilities
- Numbers, grades & capacities
- Watchkeeping patterns
- Hours of work & rest
- Required competencies

Personnel:

- Nationality of officers/ratings
- Selection
- Training
- Physical characteristics for the tasks to be done
- Terms & conditions of service
- Expected competencies

Training:

- Required knowledge, skills & abilities
- STCW requirements
- Specific training
- Appropriate courses
- In-house/onboard training facilities
- Management/leadership training
- Technical training
- Safety & security training
- Onboard familiarisation
- Onboard safety drills
- Onboard continuation training

General considerations

- International conventions / regulations
- Crew nationality
- Working language
- Size, shape & gender
- Strength & stamina
- Posture
- Religious & cultural differences
- Intended role
- Ship's operating pattern
- Tours of duty
- Watchkeeping patterns
- Environmental stressors
- Impact of fatigue/stress
- Degree of automation
- Cleanability
- Surface coverings
- Shipboard maintenance policy
- Tripping / falling / bumping / crushing hazards
- Signage
- Understandable operating instructions & procedures
- Company culture

Habitability:

- Religious & cultural differences
- Need for privacy
- Bathroom facilities
- Messing arrangements
- Facilities for personal recreation & study
- Need for natural light
- Storage space for personal effects
- Furnishing, interior design & decoration

Maintainability:

- Through-life support
- Onboard expertise
- Accessibility
- Provision & location of tools
- Location of heavy spare parts
- Bench space
- Removal routes
- Noise protected communications
- Policy for onboard spares
- Storage of spare parts and supplies
- Handling of heavy parts
- Disposal of parts & equipment

Habitability

Comfortable, clean (cleanable) & convivial accommodation, washing & toilet facilities, messrooms, group meeting and exercise areas

Maintainability

Operational maintenance tasks to be rapid, safe and effective to allow equipment and systems to achieve a specified level of performance

Survivability

Adequate firefighting, damage control, lifesaving and security facilities to ensure the safety & security of crew, visitors & passengers

Occupational Health and Safety

The effect of work, the working environment and living conditions on the health, safety and wellbeing of the person

Workability

Context of use

Manoeuvrability

The most appropriate manoeuvring capabilities

Controllability

Integrating people with equipment, systems and interfaces

System safety

The risks from people using (or misusing) the system

Photography: jalens - joachim affeldt

Human factors engineering considerations**Workability:**

- The Users
- Tasks
- Fitness for task
- Equipment
- Accessibility
- Communications
- Signage
- Protective equipment

Controllability:

- Control room, workstation, display screen layout
- Computer dialogue design
- System integration
- Communications
- Alarm philosophy & management
- Direct & peripheral vision
- Daytime/nighttime vision
- Dazzle
- Controls & switches
- Reflection
- Glare

Manoeuvrability:

- Potential weather conditions
- Communications
- Minimum / maximum / manoeuvring speed
- Propulsion / manoeuvring systems configuration
- Critical system redundancy
- Available harbour services
- Through life costs
- Protection of the environment
- Fuel economy

System safety:

- Hazard identification
- Potential for human error
- Risk Analysis
- Management of risks
- Operating instructions & procedures
- Communication/working language
- Business imperative
- Training & familiarization
- Potential for environmental damage & pollution
- Recording, reporting & feedback procedures

Survivability:

- Availability of manpower
- Emergency response systems & procedures
- Ship layout and equipment fit

Occupational Health and Safety:

- Occupational Health & Safety policy
- Safe working practices
- Development of a safety culture
- Permit to work
- Health awareness – mental & physical
- Medical screening
- Medical support
- Balanced diet
- Provision, maintenance, access & use of Personal Protective Equipment
- Short / long term hazards to health
- Recording, reporting & feedback procedures

6 Improving Safety by Applying Human Factors Methodologies

Kerry Hoad, Technical Officer, Energy Institute



Human Factors is increasingly seen as a crucial way to improve the safety performance of industry operations and help reduce accidents, thereby reducing cost to businesses and increasing their efficiency. With this in mind, the Energy Institute Human Factors Working Group, representing both upstream and downstream petroleum industry operations, was formed in 2001 to be the focus of UK petroleum industry activities.

To raise awareness of the possibilities offered by managing Human Factors, the Working Group commissioned an external consultant to establish a preliminary series of Safety Information Bulletins based on:

- Lessons learned from incidents or near misses
- New methods of working
- Novel human factors techniques

The Bulletins have been designed to encourage information sharing between professionals on the successful application of Human Factors methodologies to petroleum and allied industries operations. However, much of the information provided in the Bulletins can be transferred from industry to industry with many of the basic principles being the same.

Each Bulletin begins by providing an overview to its human factors aspect and then describes the issue in detail with the use of various illustrative media including flowcharts, illustrations and graphs. Lastly, the Bulletins refer to other suitable references and further information.

They cover a broad range of issues from occupational safety through to those with major hazard potential; some are relevant to both offshore and onshore operations, whereas others apply to individual sectors. Seven bulletins have so far been developed for:

- Manual and mechanical handling;
- Safety when using ladders;
- Assessing staffing requirements for hazardous situations;
- Improving alarm systems;
- Lifeboat design and body size;
- Managing organisational change;
- Integrating human factors into design and modification of plant

The Working Group has also published a series of Human Factors Briefing notes on the following key Human Factors issues:

- Alarm handling
- Organisational change

- Maintenance error
- Fatigue
- Safety critical procedures
- Training and competence
- Ergonomics
- Safety culture
- Communications
- Task analysis
- Human reliability analysis
- Violations
- Behaviour observation and modification
- Root cause analysis
- Human factors integration

In addition the Group has produced guidance on making robust staffing arrangements for control rooms etc, and is currently developing guidance on managing fatigue.

Further information on all these issues can be found at: www.energyinst.org/technical/human-and-organisational-factors/human-factors-safety-information-bulletins



Developing a Climate of Trust: the Human Face of Shipping

Nikolaos P Ventikos,
National Technical University of Athens

When I was thinking of what I could write in this article regarding potential interventions of ship-owners into everyday onboard crew problems, an illuminating discussion that I had with a Chief Engineer of a Greek shipping company came to mind. I asked him what simple actions shipowners can do towards continuously enhancing the quality of work and of onboard living conditions for crews. His answer can be concisely summarized as follows: *building a climate of trust between the shipowning company and seafarers.*

In principle, all involved stakeholders should focus on continuously enhancing the quality of work and of onboard living conditions for crews; this way, the maritime sector can benefit in terms of effectiveness, safety and environment friendliness.

It is a well-known fact that psychology plays an important role in human performance and behaviour; in the marine industry wherein difficult environmental conditions, limited space and long isolation of crews can be met, the problems related to the human element can worsen notably. Hence, it is of outmost significance for a shipowner or shipmanager to focus on developing a climate of trust between him and the seafarers that man his vessels, to try to outline and promote the human face of shipping.

This effort should not be considered as a trivial one. Policies and practices drafted by the company management for the improvement of seafarers' life and spirit need persistence and patience to begin to pay off. In this context, crew members would like to see shipowners (or someone high from the chain of command) to regularly come onboard and check that all

is well aboard the ship. Seafarers do not want to work for impersonal companies, and they certainly do not enjoy listening to answers such as "I am just an employee, I will see what I can do".

On the contrary, they would like to feel that they are dealing with a friend, that they are close to 'the boss' with whom they could speak and explain their problems, or demonstrate that they are vivid and productive parts of a dynamic team. Moreover, it is important for the people at sea to know that their families are well considered by the shipping companies; to that effect even a phone call from the company to the family can play an important role regarding the behaviour and awareness of the seafarer.

The Chief Engineer told me: "when crewmembers feel secure and well-taken care of they will give their 110% for the company". I believe him!



Human centred design makes a difference

7

The Royal National Lifeboat Institution (www.rnli.org.uk) - a charity funded by voluntary donations and legacies - provides search and rescue cover around the coast of the UK and the Republic of Ireland from over 230 lifeboat stations, with over 4,500 volunteer lifeboat crew. **Neil Chaplin**, the RNLI's Principal Naval Architect discusses their approach to the design of a new class of slipway-launched lifeboat.

So, the new *Tamar* class lifeboat, it's the fastest one? No. The biggest then? No.

Typical questions I've been asked as the first of this new class of slipway launched lifeboat enters operational service, but few have asked about the human centred design which makes this latest RNLI 25 knot all weather lifeboat different.

Although 7 years of development may be excessive for any commercial 16 metre design, the RNLI's demanding search and rescue role, which requires volunteer crews to go at immediate notice into any weather up to 100 miles off shore, necessitates a rigorous design process, central to which is the belief that if we look after the crew, they can look after the casualties.

Over the past 50 years lifeboats have progressed from simple 8-knot designs to 25 knot boats packed with technology, but essentially using the same volunteer crews, with the same limited training time, and the same human capabilities. So a major factor in achieving mission success is to ensure that the technology employed is safe, effective and intuitive.

The RNLI has undertaken collaborative research into human structural response to shock loading resulting in a seat that will not 'bottom out' due to shock loadings. The seat bucket (widened by 50mm to accommodate 'larger crew' in foul weather gear) has a large amplitude motion on 2 inclined rails. This motion on a tailored spring and damper system mitigates vertical and forward decelerations, however the relative motion to fixed consoles means that essential controls have been engineered onto seat arms.

Since crew are safer seated, the need to move around the boat at sea is reduced through an integrated electronics system which provides remote monitoring and operation of onboard systems. Although integrated systems provide the capability to present a plethora of information and controls, they could also confuse, mislead and overload crew unless the interface is clear, intuitive and tested. The Systems and Information Management System (SIMS) developed as part of the project presented an opportunity to develop a bespoke user interface.

Since the inception of the project, it was always recognised that the development of a common, effective and simple Human Machine Interface (HMI) would be fundamental to the success of SIMS. The plethora of different HMI's assembled in a typical search and rescue vessel presents organisations with usability and training challenges, not to mention the potential for misinterpretation and misunderstanding by users. An early

review of systems employed on the RNLI's own and other similar vessels failed to reveal a suitable HMI for adaptation across other applications.

Furthermore, since the success of SIMS will ultimately be judged by the end users, crew involvement was essential to ensure:

- Simplicity of use;
- Clarity of presentation of information;
- Robustness and reliability;
- Redundancy in the event of failure.

This development therefore involved RNLI staff and crews together with Human Sciences experts.

The resulting prototype version of SIMS was fitted to the *Tamar* for an intensive period of crew evaluation of the system. The evaluation trials structure was developed in conjunction with ergonomics consultants to ensure that the trials were relevant and would produce appropriate input to any re-development of the system prior to introduction to service.

Seven years is indeed a long time to develop one boat; however with the seats and SIMS we now have components that can be applied to future lifeboat designs and perhaps retrofitted to current ones to enhance the safety of our volunteer crews.

Further information on the design approach to the Tamar Class lifeboat can be found at: www.he-alert.org (Refs: HE00495 & HE00500)

Leading for Safety: A practical guide for leaders in the Maritime Industry

The UK Maritime and Coastguard Agency has updated its booklet *Leading for Safety*, which can be downloaded from the **Alert!** website database www.he-alert.org (Ref: HE00440)

Addendum to Guide for Maritime Operations

The US Coastguard has produced an Addendum to its *Crew Endurance Management Practices: A Guide for Maritime Operations*.

*Both the Guide and the Addendum can be downloaded from the **Alert!** website database at: www.he-alert.org (Refs: HE00265 & HE00520)*

What's new...

The 94th (Maritime) session of the International Labour Conference

The International Labour Organization has adopted the Maritime Labour Convention, 2006, which consolidates and updates 68 existing ILO maritime Conventions and Recommendations adopted since 1920. The Convention sets minimum requirements for seafarers to work on a ship and contains provisions on conditions of employment, hours of work and rest, accommodation,

recreational facilities, food and catering, health protection, medical care, welfare and social security protection. It will come into force after it has been ratified by 30 ILO member States with a total share of at least 33 per cent of world gross tonnage.

Note: ILO MLC 2006 was implemented in August 2013. For further information go to: www.ilo.org/global/standards/maritime-labour-convention/lang-en/index.htm

Collision between a container ship and a linkspan

This report of a collision between a 94483 gross tonne container vessel and a linkspan highlights a number of Human Element issues - not least the need for increased training in the operation, maintenance and fault finding of technically complex, and multi-discipline systems.

The ship was entering the swinging ground, prior to berthing, when her main engine failed. The engine was unable to be started astern to reduce the vessel's headway, resulting in her making heavy contact with the linkspan. The ship had been delivered from the builders a few months before the accident.

An engine failure had occurred as the ship approached the pilot boarding ground some four hours previously. Although the engineers managed to re-start the engine, they misdiagnosed the cause of this failure and inadvertently disabled an integral part of the control system, which led to the second failure, the cause of which was also misdiagnosed by the engineers.

The report concludes that although the engineers on board were experienced and held appropriate STCW certificates, they were unable to correctly diagnose the

reason for the engine faults. They did not have a sufficiently good knowledge of the main engine control system or specific system engineering training to successfully diagnose faults. The chief engineer was not the designated chief engineer for the ship but was transferred at short notice. He had not received any specific training in the operation of the Electronic Control System (ECS) components of the engine, apart from what could be conveyed during a 3-day handover with the former chief engineer. None of the ship's technical staff had received any formal training in the operation, testing, maintenance or fault finding of the complex ECS. They were also not aware of a 24-hour telephone hotline to the engine manufacturer, to give additional technical support.

The report observes that the generic training undertaken by marine engineers during courses leading to professional qualifications, may be insufficient on its own to equip engineers to operate, maintain and successfully diagnose and repair faults on fully integrated, complex engine systems. It recommends that shipowners ensure that, where appropriate, their Safety Management Systems include the need

for additional measures, such as effective type-specific training for engineers, and a longer period of supervision by guarantee engineers.

It recommends a review of the training requirements for marine engineers within STCW – to take account of continuing developments in propulsion technology, particularly where main propulsion systems employ integrated combinations of mechanical, electrical, electronic and hydraulic systems essential to the proper and continued functioning of the overall system.

The report also raises questions about the proliferation and identification of alarms; the need for joint simulator training for pilots and tug masters, and for tug masters to make ship visits in company with pilots; and the difficulties of effectively testing the main propulsion systems of large, powerful vessels when alongside, prior to departure, due to the potential for mooring rope failure.

The full report can be downloaded from: https://assets.digital.cabinet-office.gov.uk/media/547c708fe5274a428d0000ab/Savannah_Express.pdf

Reports & Studies

DOES WORK KEEP YOU AWAKE AT NIGHT?

S Goodwin,
Det Norske Veritas, UK

This paper discusses fatigue and presents some of the results from a major research programme designed to investigate seafarer fatigue. Common sense, as well as fatigue research, tells us that we need enough sleep to feel well rested and alert. Yet fatigue is a key issue challenging performance and safety in the maritime industry. The problem is best addressed using an approach that seeks to identify those areas where the problem is greatest and targets solutions accordingly, allowing us to achieve "alertness when required and sleep when desired".

Downloadable from: www.he-alert.org
(Ref: HE00505)

LEARNING FROM EXPERIENCE – ADOPTING A SYSTEMS APPROACH TO THE ANALYSIS OF MARINE INCIDENTS

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Lloyd's Register, UK
B Sherwood Jones, Process Contracting Ltd, UK

The authors present a "systems approach" to incident analysis as a practical methodology by which the learning potential from incidents can be maximised. Some well-known incidents are reassessed, which suggest that more information can be gleaned, including causal factors that may otherwise be missed. From a classification society perspective it is important that incident analysis is searching and comprehensive so that appropriate mitigation measures can be developed to reduce the risk of recurrences.

Downloadable from: www.he-alert.org
(Ref: HE00510)

NON-TECHNICAL SKILLS: THE VITAL INGREDIENT IN WORLD MARITIME TECHNOLOGY?

Prof Michael Barnett, David Gatfield, Clair Pekcan
Southampton Solent University –
Warsash Maritime Centre

The significance of human factors in commercial shipping operations is now universally recognized. But, in comparison with our appreciation of technology, the application of our knowledge concerning human performance and the factors that shape and influence it remains relatively neglected, and certainly unexploited in the safe conduct of maritime operations. This paper opens with a review of recent accident analyses and case studies to highlight the importance of non-technical skills in contributing to major casualties. It provides an overview of recent innovative developments in simulator-based non-technical skills training and assessment, through which a number of key issues are addressed.

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