

The International Maritime Human Element Bulletin

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Alert!



Responsibilities come before skills. Each of the **Alert!** bulletins in this series is about defining the responsibilities of a particular stakeholder group with respect to addressing the Human Element. From these we intend to develop descriptions of the knowledge and skills necessary to discharge those responsibilities.

But, we would not be 'user-centred' if we did this on our own. Contributions from those who have already benefited from the right training and experience will be essential to ensure that we get it right. What we offer in the centrespreads will serve as a 'first draft', which we will ultimately develop through the **Alert!** website, with a view to providing a comprehensive human element skills framework for all the various stakeholders by the end of this series of bulletins. Feedback, therefore, is essential – and very welcome.

Through the **Alert!** bulletins and the website, we seek to represent the views of all sectors of the maritime industry on human element issues. Contributions for the Bulletin, letters to the editor and articles and papers for the website database are always welcome.

The Editor

Alert!

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Integrity, professionalism and transparency - the hallmarks of a good surveyor

In many respects, the surveyor/inspector is the epitome of what the human element is all about, because he/she is one of the few whose role it is to interact directly with other humans, primarily the seafarers. The surveyor therefore needs to possess many human element attributes plus the knowledge and skills to do the job.

That is not to say that every surveyor and inspector needs to be a human element expert, but they must at least have an understanding of its relevance in the design, build and operation of a ship and its systems – to what extent depends on the specific role of an individual surveyor or inspector.

The required knowledge, skills and attributes of a surveyor/inspector are many and varied. Not only do they need to have the necessary professional qualifications but also they must be able to relate to those with whom they will come into contact, both ashore and afloat, in the course of their work.

To this end, they must have a good knowledge of 'the ways of the sea' - ideally, they should have held a senior position at sea so that they can use their technical skills to exercise professional judgement. They must be current not only in their knowledge

of the regulations but also in understanding the latest technology and how it is applied onboard ship.

They must also be able demonstrate good leadership and the ability to communicate effectively to those whose first language may not be the same as theirs. And, they must be capable of producing concise written reports, with clarity of thought, and which are understandable even to those whose first language may be different to that in which the report is written.

The IMO's Code of Good Practice for Port State Control Officers (PCSOs) encompasses three fundamental principles against which all actions of PCSOs are judged: integrity, professionalism and transparency. These are the principles that should be adopted by any person who is engaged in the business of surveying or inspecting ships and their systems which of course, includes the people who operate them.

These principles are the hallmarks of a good surveyor/inspector and should bring with them the need to understand how humans interact with other humans, machines and systems.





The need for human element competence among Classification Society Surveyors

Olivia Walker, Curriculum Leader, Senior Specialist – Human Element, Lloyd's Register

One way for the human element to make an impact on a large scale is through the inclusion of ergonomic design requirements in Classification Rules and Regulations. Class provides a means, with corresponding verification, to make far-reaching ergonomic improvements, benefiting a large number of seafarers. A consideration of ergonomics in ship design will help to enhance operational safety, reduce the risk of error and improve efficiencies and situational awareness.

A key part of the Lloyd's Register strategy for the human element is to improve the way it is addressed in its core Rules. This is a challenging activity and one which has no quick win solution. There are a wide variety of hurdles that need to be overcome during the rule development process. However, progress is being made, and this year sees the first major ergonomics input to the Rules, addressing ergonomics at control stations and in the presentation of alarms.

However, having well written, verifiable ergonomic Rule requirements addresses only one part of the Lloyd's Register strategy. The verification of any ergonomic

requirements in the Rules will be undertaken by surveyors. Therefore, any attempt to address the human element in the Rules requires that the competence of surveyors is increased at the same time as the Rules are revised.

Unfortunately, knowledge and awareness of the human element is often poor or indeed absent among surveyors. Surveyors are trained to make decisions about engineering not human behaviour. They generally receive no more than basic training in matters such as Occupational Safety and Health (OSH) or work system design. Hence, raising awareness of the subject is an essential first step if the benefits of improved design are to be realised. The need to have a human element competency framework for surveyors is now recognised as being as important as having a Rules development strategy in this area.

Following an analysis of the knowledge, skills and attitudes required for a baseline human element competency, a suitable training delivery programme has been proposed. In the first instance, a human element e-learning course with online assessment will be developed to raise

awareness. This course will be fairly basic in scope, as it needs to lay the foundations of education in this subject. The intention is for the course to be rolled out in early 2012 and for it to be completed by all marine surveyors. Successful completion of the training and its assessment will become the means to assess surveyor competency in the human element.

The success of the training course will be measured by our training feedback process and by the number of enquiries received from surveyors. We do not expect surveyors to make expertise-based human element decisions, but we do hope that they will be able to recognise human element issues and will seek assistance from a human element specialist when required.

As the Rules develop in the different engineering areas, specific training will be developed. These training courses will then become part of the competency schemes within the specialised domains.

The full paper on which this article is based can be downloaded from:

www.he-alert.org/filemanager/root/site_assets/standalone_article_pdfs_0905-/he101035.pdf



Winners and losers an oft mentioned perception

Captain Andy Glass, Manager, Assessment & Inspection, BP Shipping Ltd

This article considers how the human element relates to my role running the Assessment and Inspection department in BP Shipping. The department is responsible for approximately 3,500 bespoke pieces of assessment a year, largely SIRE ship inspections but also encompassing technical manager, marine terminal and structural assessments.

The oft mentioned perception, particularly when it comes to ship inspections, is that there need to be winners and losers, that inspectors attend to find fault and that they are programmed to find as many issues as possible. My own perception of this is entirely different - inspectors attend vessels on behalf of a principal, and - certainly in the case of BP - they are onboard to undertake a quantified risk assessment of the vessel and her operation to determine if the level of risk to the business is acceptable for the potential carriage of one of our cargoes. Differing perceptions are a classic symptom of the human element. I believe that in

this instance our required outcomes are similar and with some slight changes in behaviour we could be better aligned and able to deliver what we are all looking for - safer vessels.

The benefit a ship inspector brings to the equation is an independent, experienced set of eyes to help manage our risk, and yours. You possibly see one thing due to familiarity, we possibly see things differently, bringing a fresh, experienced approach.

To quote from UK Maritime and Coastguard Agency (MCA) publication *The Human Element - a guide to human behaviour in the shipping industry*: 'Humans are not simply an element like the weather. They are at the very centre of the shipping enterprise. They are the secret of its successes and the victims of its failures.' And: 'Our ability to share situations, goals and meaning depends on two other key human properties: empathy and communication.'

During an inspection, many of the conversations have the potential to become 'difficult'. Ensuring all parties understand the outcome of these

conversations is not about winning and losing, but about creating an opportunity for improvement. Instilling behaviours that are respectful of others' positions, and empowering all parties to have a voice and be willing to use it, are important. Inspectors should be respectful of the officers and crew and the fact they are temporarily in their living and working environment. On the other hand, ship's staff also need to be respectful of the inspector - he/she is a well-qualified and experienced individual representing a customer.

In the event that respect and basic communications are evident and in place, I believe the inspection process has the ability to deliver mutual benefit.

The Human Element publication has relevance for every aspect of what we do in our industry. I should have read it when changing roles recently; it helps inform your perception of everything you do.

***The Human Element - a guide to human behaviour in the shipping industry* is downloadable from:**

http://webarchive.nationalarchives.gov.uk/20110120060951/http://www.seasmart.org.uk/c4mca/lrgtxt/the_human_element_a_guide_to_human_behaviour_in_the_shipping_industry

Human element skills and knowledge required of P&I surveyors and inspectors

Captain Julian Brown, CEO, JCP Marine Pte Ltd, Singapore

2012 marks JCP Marine's 20th anniversary. During that time we have developed our own criteria for recruiting marine surveyors. Whilst we survey a diverse variety of ship types – generally for underwriters, charterers and law firms – we are well known for our tanker expertise and place a strong premium on our surveyors possessing good tanker qualifications and experience. Other companies will have their own specific and individual needs. In this short article, I will take you briefly through our recruitment criteria for surveyors.

At its heart we need technically qualified personnel. Borrowing from the Ship Inspection Report (SIRE) and Chemical Distribution Institute (CDI) programmes, this translates into the applicant holding a certificate of Competency (Deck Officer or Marine Engineer) Class 1 with at least an Oil Dangerous Cargo Endorsement; having a total of 60 months sea time served on tankers; of which at least 24 months has been in the capacity of senior officer i.e. Master, Chief Engineer, Chief Officer or Second Engineer Officer.

Our preference is that candidates already possess lead auditor qualifications, but will consider those who have completed ISM or ISO internal auditor training at a recognised training establishment. If necessary we will complement the candidates basic ISM and ISO certification with externally provided ISO 14000 and ISO 18000 training.

Beyond the those basic technical qualifications, we need surveyors who are knowledgeable with respect to industry standards and international rules and regulations appropriate to the vessels being inspected. In-house Computer Based Training (CBT) software allows us to independently verify technical skill levels.

Less easily defined perhaps, but the softer skills can be equally important as technical ability. The ability to communicate clearly and effectively with ship's staff is essential. Generally that means possessing a good standard of spoken English, although for some regional offices where it is primarily domestic trade that is surveyed, that can be a secondary consideration. Clarity of thought; a logical approach; and the ability to produce concise written reports, are all essential client requirements.

Safety awareness is paramount and a surveyor needs to be constantly aware of the risks and hazards that surround him. As we are frequently reminded, ships can be dangerous places: enclosed space entry incidents remain a depressingly common feature of our industry. Wearing the appropriate safety apparel, carrying a suitable gas meter and setting a good example regarding PPE and safety when on board ship are in my mind important attributes of a surveyor.

The range of survey requirements means that not all skills are required by all surveyors. The temperament and technical abilities needed to assess the condition of tank coatings do not neatly overlap with the ability to analyze the documentation relating to a fuel oil cargo contamination nor again with assessing navigation practices and machinery incidents.

Independence, integrity and an inquisitive mind are all essential traits, which in my experience most mariners who come ashore already possess. There are many more I could go on and list. But that's for a future article perhaps.

The US Coast Guard application of Safety Management Systems and Auditor skills

Rear Admiral J A Watson, USCG Director, Prevention Policy

Currently, US vessels engaged on foreign voyages and subject to SOLAS must comply with the International Safety Management (ISM) Code. ISM auditing has been delegated to recognized class societies. Class society ISM auditors must be certified to the International Register of Certified Auditor (IRCA) competency standards.

The Coast Guard offers a Streamlined Inspection Program (SIP) as an alternative to traditional Coast Guard inspections. Much like SMSs, company personnel conduct frequent, periodic examinations of the various vessel systems, document their findings, and take the necessary corrective actions. A third party auditor is not required. Under this program, the Coast Guard still conducts required inspections of participating vessels; however, the manner of conducting the inspections is more to verify that company personnel have completed self examinations and corrected discrepancies in accordance with an approved streamline inspection program.

The Coast Guard has published proposed regulations governing the inspection, standards, and safety management

systems on towing vessels to promote safer work practices and reduce casualties by requiring that towing vessels adhere to prescribed safety standards and safety management systems.

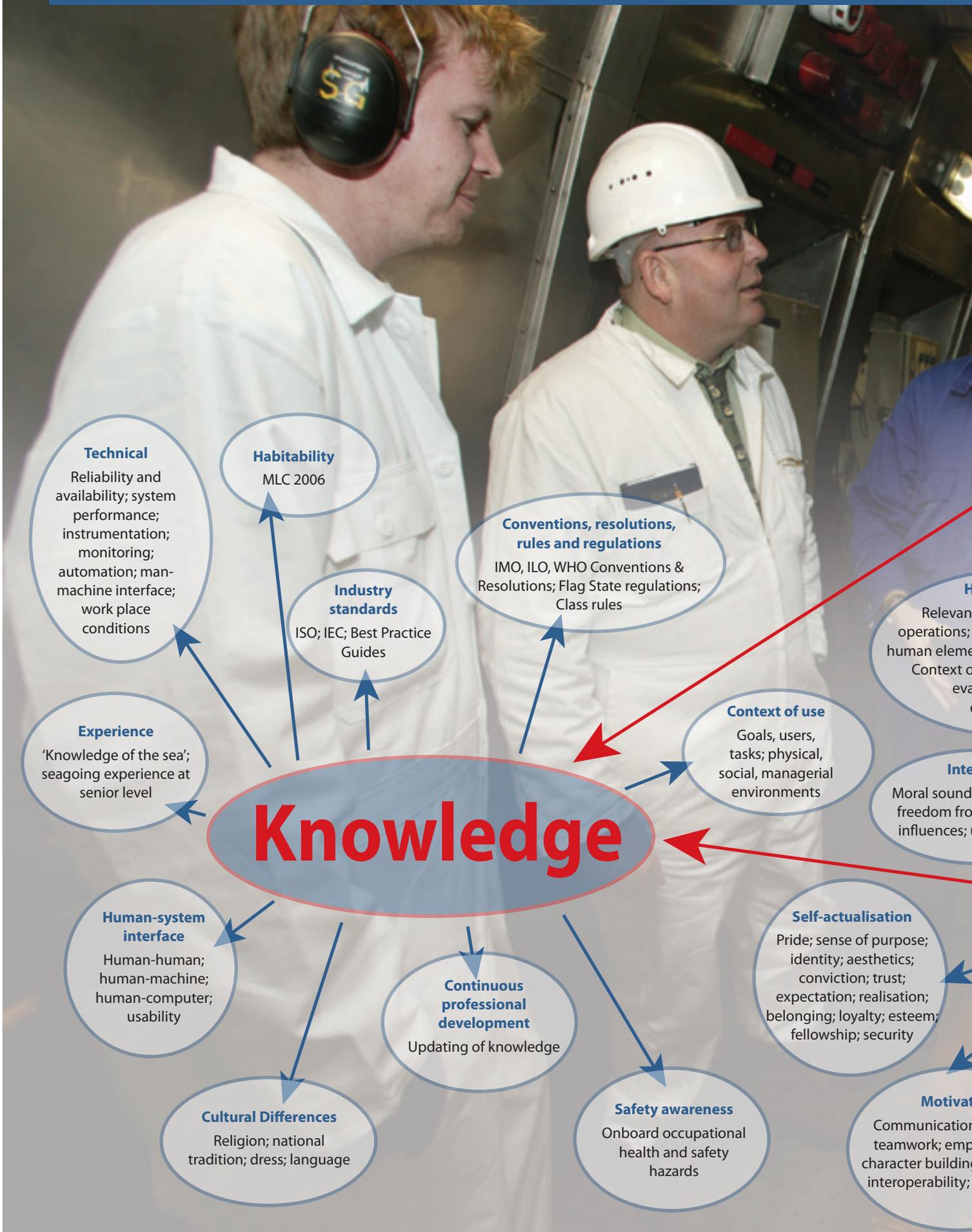
Through this rulemaking, the Coast Guard intends to broaden the available pool of auditors, beyond those authorized to conduct audits for ISM (now, only our authorized classification societies) to include organizations that meet prescribed standards. The proposed rule for towing vessel safety auditors requires that states auditors must meet the following qualifications:

- High school diploma or equivalent
- Four years of experience working on towing vessels or other relevant marine experience such as Coast Guard marine inspector, military personnel with relevant maritime experience, or marine surveyor
- Successful completion of an International Organization for Standardization (ISO) 9001-2000 lead auditor/assessor course or Coast Guard recognized equivalent

- Successful completion of a required training course for the auditing of a Towing Safety Management System
- Audit experience, as demonstrated by documented experience in auditing the ISM Code or the American Waterways Operators Responsible Carrier Program, consisting of at least two management audits and six vessel audits within the past 5 years; or successful completion of a required auditor apprenticeship, consisting of at least one management audit and three vessel audits under the direction of a lead auditor.

In summary, the Coast Guard has shown commitment to safety management system audits and expects those who conduct audits, whether for ISM or other forms of SMS, to have both formal training and marine industry experience. Further, the Coast Guard has recognized the difference between an inspector's skill set and an auditor's skill set in each of its implementing policy decisions and generally expects auditors to come from the private sector

Surveyors & Inspectors – Knowledge, Skills & Attitudes







Human factors in surveyor training - meeting the challenge

Martin Crawford-Brunt, DNV Classification Manager, UK & Ireland

Classification society surveyors attend new vessels under construction, vessels damaged or under repair or annually for routine inspection while the vessels are in service. The surveyor's job is to ensure that vessels surveyed comply with the own rules of the class society and the statutory requirements of the Flag states they are authorised to represent.

Given the multitude of new ship types and MOU's afloat today and the trend towards the concentration of dry dock surveys in a fewer and fewer locations worldwide the challenge of training surveyors who are able to support the industry with practical solutions which comply with all the required regulations is increasing.

Many surveyors join classification societies with degrees in naval architecture as I did. In the development of my training plan I asked for the opportunity to go to sea and within a few months of joining DNV I was signed onto a 23 year old open hatch bulk carrier with twin gantry cranes. Half of my time was spent in the engine room and the other half on the deck side. Participating in auxiliary engine overhauls, changing a cylinder liner at sea and joining bridge watch keeping and cargo operations were highlights.

Seek the opportunity to sail on a merchant vessel to gain a better understanding of how ships are operated as this will improve your knowledge and communication with the crew and officers on board. This in turn will make you a much more effective surveyor, designer or auditor as often the best way of finding out the strengths and weaknesses of the team on board and the true condition of the ship is to ask the right questions.

Opportunities to participate in dry dockings and voyage surveys have reduced in some parts of the world. Although no direct substitute for practical experience, surveyor competence development can be supplemented and enhanced through virtual reality training which is increasingly used by the military today.

In 2009 DNV developed a ship survey simulator called SuSi. Initially this was available only at our training school in Gdynia, Poland, where it was developed but it has been used in classrooms around the world and finally has been installed on each surveyor's laptop. Thousands of survey findings and damage cases have been entered based on DNV's knowledge base to test the surveyor's knowledge of statutory requirements, terminology and reporting. For instance load line convention specific items can be highlighted on the ship to aid clarity.

Just as in real life, the surveyors have a camera, torch and spray to use in the simulation. Part names, certificates and surveyor checklists are displayable on a virtual PDA as they move around the ship. In tank inspections torch light is simulated to demonstrate the difference good lighting makes to observations. Close-up surveys using cherry-pickers is also simulated. As trainees develop the skills they need to report findings correctly, they must also deal with the safety hazards that would be experienced on board a real ship.

Conditions such as corrosion and coating failure can be accelerated or retarded and resulting damages included that vary depending on the structure involved and the ships 'history'. All of this is presented in a realistic 3D environment which allows views from any angle including the bottom in dry dock which accelerates experience in reporting structural defects accurately. Even very experienced surveyors have been surprised by what they learned in the simulator.

Human factors and experience can't be replaced by technology; however we should embrace it as part of the solution to enhance the competence of surveyors going forward.



Surveying and inspection of ships The human element requirements for the future

Captain Chris Spencer, Chairman, Commercial and Technical Group, International Institute of Marine Surveying

Many of the skills will be the same or similar to those needed today. There will however be an increased requirement to show that one has acquired training and gained the skills in a planned and focused manner and that continuous professional development (CPD) had been and is an ongoing feature of all surveyors' lives.

The Human Element requirements for commercial surveyors have never been considered at any stage other than at a very basic level during interview procedures.

Given that the main task for surveyors is to determine the cause of damage, accidents and incidents it will be necessary to consider some of the skills that might be necessary in other walks of life where human element skills are being recognized.

The most basic I have come across is

body language training that I learnt (amongst other techniques) when training as a mediator (I look at everyone differently now!).

There are important Interview training techniques to understand in respect of open, closed and leading questions. Other aspects of mediator and arbitration training cover report writing, necessary procedures and case studies. Surveyors, consultants and expert witnesses could all benefit enormously from such training which would allow one to recognize how to keep people on-side, how to recognize and deal with the defensive/aggressive responses, and how to keep your own focus.

There will also be specific 'on the job' situations in the field such as on a damaged ship, in a hold with damaged cargo or just in the ship's office which beg the questions:

- Are you getting the data/co-operation you need?
- Are you working with or against your opposite number?
- Have you got the right attitude?
- What are your negotiation strategies?

We have many of the techniques to be invaluable in forming better interviewing techniques, better guidance to surveyors for interviewing potential witnesses and to improve techniques for general information gathering.

All of the above will require increased training, CPD and attention to changing legislation. The IIMS is the only body in the world dedicated to the training and education of marine surveyors and marine consultants; and, new and tailored short courses are coming on line all the time.

www.iims.org.uk

Maritime Labour Convention Inspectors Addressing the Human Element

7

Cedric D'Souza, Liberian International Ship and Corporate Registry The Reverend Canon Ken Peters, Mission to Seafarers

Article IV of MLC, 2006 lays down the seafarers' employment and social rights. It is the responsibility of each Administration to ensure that the seafarers' rights provided under titles 1, 2, 3 and 4 of MLC, 2006 are fully implemented in accordance with the requirements of the Convention.

Many of the requirements of the Convention are implemented through national rules and regulations and collective bargaining agreements and can be inspected through a review of the records on board, such as the records of hours of work or rest and payment of wages. However some requirements such as those like fatigue, stress, health and the over-all well-being of seafarers, which are related to the human element, may not be readily inspected through records and paper-work.

That is why inspectors carrying out maritime Labour inspections should not only be aware of the visible evidence of compliance with the seafarers' social and employment rights, but also of the hidden factors related to the well-being of seafarers, such as their culture, attitude and beliefs. Inspectors should be able to see the broader picture during a Maritime Labour inspection and be able to effectively communicate with seafarers including listening to complaints and where possible, resolving complaints on board.

Inspectors are not psychologists, doctors, social workers or lawyers who can solve all problems related to seafarers well-being, but being the representative of the Administration, they can, where required certainly listen to seafarers and transmit the information to the Administration.

Inspectors are and must be persons of authority, integrity, discernment and independence. An inspector must be able to recognize deficiencies and seek shipowners to propose remedies to deficiencies.

Lack of well-being impacts upon performance and introduces unacceptable risks that detract from the safe operation of the vessel

The standard of safety on a ship is dependent not only on the health of the ship but more on the health of the seafarers in charge of the operation of the ship – (M Fuazadeen of IMO)

Mariners who have seen ships become harder worked, meaner places, with insufficient attention given to anything other than revenue generation might be a little skeptical at any enthusiasm for 'softer values' – (Michael Grey)

Investment in crew will provide returns far in excess of the cost involved, but to achieve this, you have to design ships that fit snugly around their human operators – not just fitting people in where they won't interfere with the cargo or propulsion machinery at the very end of the design process – (Michael Grey)

The competency and professionalism of seafarers are seriously undermined by personal concerns and emotional debilitation. Lack of well-being impacts upon performance and introduces

unacceptable risks that detract from the safe operation of the vessel.

Even on the best run ships, modern shipping operations contribute to isolation and stress for seafarers. The ILO Commission was told of social and mental problems arising from long absences from home and the lack of means to contact families for extended periods and social isolation on board arising from the use of mixed crews with widely different cultural, linguistic and other requirements. These problems are compounded by the remoteness of many modern ports and terminals from sources of social interaction. Shorter stays in port, with minimal time for rest and recreation add to fatigue. MLC, 2006 requires that seafarers working on board a ship have access to shore-based facilities and services to secure their health and well-being.

In addition to inspecting and certifying ships for compliance with the requirements of MLC, 2006, Administrations should also ensure that their inspectors are able to address welfare concerns of seafarers such as those related to: paying to obtain jobs; non-payment of wages; abandonment; denial of medical care; restrictions and/or denial of shore leave; fatigue and stress; blacklisting; and denial of repatriation. All of these have a significant impact on the well-being of seafarers, have implications for their health and safety and the safe navigation of ships.

Liberia has been the front runner in preparing its Maritime Labour Inspectors with specialized training provided by the Missions to Seafarers, in addressing the human element during Maritime Labour inspections, having trained over 100 inspectors to date.

Alert! Videos

The **Alert!** videos aim to raise the awareness of maritime human element issues amongst the estimated 500,000 students engaged in all disciplines of maritime study. Sponsored by The Lloyd's Register Educational Trust, and produced by The Nautical Institute, in conjunction with Videotel, these videos exploit the power of high quality multimedia presentation specifically designed to be viewed and shared by international maritime students.

The 3-5 minute videos are designed to engage the younger generation of students studying disciplines such as navigation, engineering, naval architecture, surveying, law, finance, insurance and administration - many of whom may have never experienced the environment of a ship at sea.

The videos can be downloaded from:
www.he-alert.org/en/videos.cfm



Fire on the main vehicle deck of a ro-ro passenger vessel

This joint report from the UK MAIB and the Bahamas Maritime Administration features a fire that broke out on the main vehicle deck of a 14,000 grt ro-ro passenger vessel. It highlights a number of issues relating to the safety of the ship, its crew, passengers, stevedores and fire and rescue service personnel.

Whilst on passage, a fire was detected on the main vehicle deck. The officer of the watch and duty engineer initially thought the alarm was due to a fault with the fire detection system, and the vehicle deck water drenching system was not started until 20 minutes later.

The fire developed in an unaccompanied curtain-sided refrigerated trailer that was carrying a load of potatoes. The trailer roof shielded the flames from the drenchers and the fire continued to burn. The trailers were tightly stowed; crew had great difficulty gaining access to the fire and were unable to extinguish it.

Unprotected cables and pipework running above the fire were soon damaged in the high temperatures that were

generated by the burning curtain-side and cargo packaging materials.

The vessel lost power to forward mooring deck winches and bow thrusters, and control of the rudders was disrupted. Loose cargo partially blocked the deck drains and drencher water caused the ship to list. Drenching was stopped while water drained to prevent further risk to the vessel's stability, but each time it was stopped, the fire grew in intensity.

With tugs standing by, the ship entered harbour and berthed alongside. The control circuits for the ro-ro hydraulics had been burnt out, but the engineers managed to bypass the system and were able to open the stern door. Few foot passengers were carried on the route and the ship never used a gangway. Although the port was able to provide a gangway, it was difficult for personnel to move through the tightly stowed vehicles on the upper vehicle deck to get from the gangway into the accommodation. It was decided that it was safer to leave the 62 passengers on board rather than risk

evacuating them by the gangway, lifeboat or marine evacuation system.

The local fire and rescue service (FRS) attempted to gain access to the seat of the fire, but struggled to get past the vehicles and make their way through the cargo debris. Firefighters, crew and stevedores worked together to contain the fire, unlash and remove undamaged trailers. Once a route through the main vehicle deck had been cleared the passengers were escorted off, nearly 20 hours after the fire had first been detected.

Subsequent investigation found that the fire was due to one of the ship's reefer cables being assembled incorrectly.

The purpose of this summary is to highlight certain human element issues arising from this incident; there are many other issues highlighted in this very comprehensive accident report. Those who are involved in the design, regulation, management and operation of ro-ro passenger vessels are strongly advised to read the whole report which identifies all the safety issues raised by the case, and can be downloaded from:

<https://assets.digital.cabinet-office.gov.uk/media/547c6fb0e5274a428d000037/CommodoreClipperReport.pdf>

Reports & Studies

Fatigue and performance in bridge and engine control room watchkeeping on a 6 on/6 off regime

P Maurier, P Corrigan, Bureau Veritas
M Barnett, D Gatfield, C Pekcan, G Clarke,
Warsash Maritime Academy

The HORIZON project is a European Framework 7 sponsored research project to investigate the effects of fatigue on the cognitive performance of marine watchkeepers using a range of simulators and under different watch patterns and conditions of workload. This paper describes the HORIZON project and illustrates some of the emerging results.

www.he-alert.org/filemanager/root/site_assets/standalone_article_pdfs_0905-/HE01040.pdf

Internal Audit and Good Ship Management

Captain Andreas Togantzis
Shipmaster

Written in response to Issue 26 of **Alert!**, Captain Togantzis argues that, while internal audit is an important part of the effectiveness of a Company's Safety Management System, it has been misunderstood both by ship and office personnel.

www.he-alert.org/filemanager/root/site_assets/standalone_article_pdfs_0905-/he01045.pdf

New Shipboard Technology and Training Provision for Seafarers

H Sampson & L Tang
Seafarers International Research Centre

This report is based upon a study funded by The Lloyd's Register Educational Trust (The LRET). The study was conducted at the Seafarers International Research Centre (SIRC) and its focus was upon new shipboard technology and training. The study was questionnaire based, and data from 1,007 completed questionnaires is presented within the report.

www.sirc.cf.ac.uk/Uploads/Publications/New%20Shipboard%20Technology%20&%20Training%20Provision%20for%20Seafarers.pdf

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